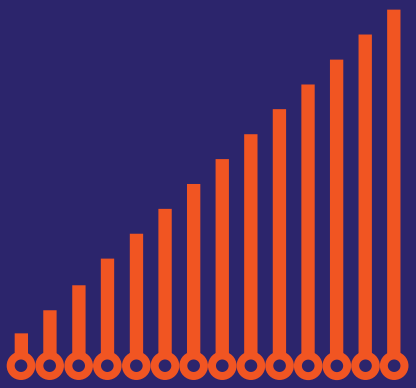
CENTRE OF PLANNING AND ECONOMIC RESEARCH

Issue 36, June 2018

GREEK ECONOMIC OUTLOOK



- Macroeconomic analysis and projections
- Public finance
- Human resources and social policies
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- Special topics

GREEK

Economic Outlook

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Editorial

As the Greek programme is approaching its completion, the past few months have been characterised by intense activity. A staff-level agreement of the Eurogroup Working Group (EWG) was reached on 19 May on a package of reforms –including privatisations and energy market reforms– required for the successful completion of the fourth and final review of the Greek programme. This agreement was presented to the Eurogroup of 24 May 2018. However, by all accounts it will not be possible for the government to implement all 88 preconditions for the conclusion of the evaluation by the 21 June target date, when the Eurogroup is set to discuss a comprehensive exit package, including the conclusion of the evaluation, post-bailout fiscal oversight, and debt relief. The European creditors are reportedly prepared to wait until mid-August –just before the scheduled end of the bailout programme– for implementation of the agreed reforms. Another crucial issue is the discussion on debt relief for Greece, which remains critical to the economy's long-term prospects. Thus far, no definitive decisions have been taken on Greek debt or the International Monetary Fund's role, as that issue will be part of a comprehensive package agreement to be decided at the 21 June Eurogroup in Luxembourg.

In the international arena the most important development was the announcement on June 12 –and signature on June 17– of the agreement between Greece and the Former Yugoslav Republic of Macedonia (FYROM) after over two decades of deadlock between the two countries. The agreement on the name "Northern Macedonia" ("Severna Makedonija" in Slavic and "North Macedonia" in its English version) was the culmination of a long and complicated process that still faces several challenges before it can be fully implemented. A key challenge will be the ratification of the agreement by the Parliament in Skopje and then by popular referendum in FYROM. Questions also arise concerning the timeline for the implementation of the agreement, which is estimated at almost two years, since it provides for a transitional period for each chapter of the agreement. However, the most crucial challenge for both sides concerns the political management of the situation on a popular level, as intense and negative reactions have already been expressed and tensions are running very high both in Greece and FYROM.

In this dynamic context, the articles presented in the 36th issue of KEPE's *Greek Economic Outlook* offer an analysis of current developments in the Greek economy and the international environment, as well as more specialised and specific economic issues. Part One examines recent developments and prospects for the main components of demand, the evolution of the Consumer Price Index in Greece and the Eurozone, and the factor model forecast for short-term prospects of GDP. An overview of the recent economic developments and prospects in the international environment as well as in the Western Balkan region is also presented. Public finances are examined through an analysis of the State Budget Execution (First Quarter 2018) as well as the evolution and structure of public debt. Recent developments in key variables of the Greek labour market are discussed, and an analysis of the Special Eurobarometer on the Integration of Migrants (the Case of Greece) is presented. Finally, sectoral policies are analysed through an examination of the external trade of agro-food products as well as developments in the transport fuels market for the 2016-2017 period (and the impact of the Excise Duty increase). Part Two of the journal hosts four in-depth and specialised articles that focus on important current topics. The first article analyses the "Changes in inequality and poverty in Greece: 2007-2015". The second examines "The significance and impact of the time and cost of (non-) collecting claims on receivables from non-performing bank loans (NPLs)", while the third presents an analysis of "E-commerce and Information and Communication Technologies in Greek firms". Finaly, the last article discusses "Applying behavioural insights to policy-making".

RITSA PANAGIOTOU
Editor

1. Macroeconomic analysis and projections

KEPE, *Greek Economic Outlook,* issue 36, 2018, pp. 4-10

1.1. Recent developments and prospects in the main demand components

Ersi Athanassiou

According to the latest seasonally adjusted data of the quarterly National Accounts (ELSTAT, March 2018), the rate of change of Greece's GDP reached 1.4% in 2017. This development reflects a continuous improvement of economic conditions in the country, with a gradual acceleration of GDP growth from 0.4% in the first quarter of the year to 1.9% in the fourth quarter, as compared to the corresponding quarters of 2016. Crucial positive contributions to developments in GDP during 2017 came from the side of exports of goods and services, which increased consistently and substantially, but also from the side of fixed capital investment, which at times expanded strongly. On the other hand, an inhibiting factor against a more dynamic recovery of the GDP was the evolution of private con-

TABLE 1.1.1 Main macroeconomic data

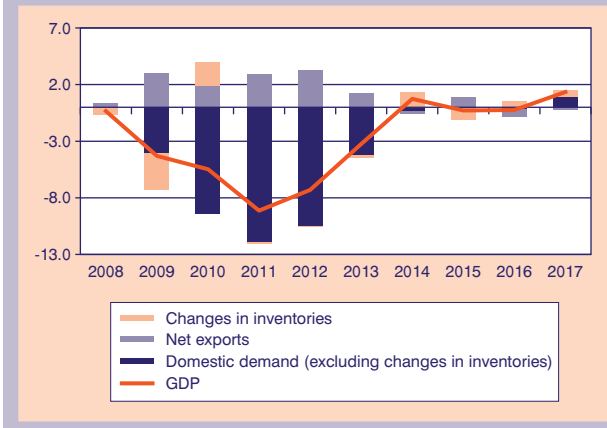
	Billion EUR	% change compared to the previous period	
	Current prices	Constant prices	
	2017	2016	2017
Private consumption	123.3	0.0	0.1
Public consumption	35.5	-1.5	-1.1
Gross fixed capital formation	22.5	1.6	9.6
of which			
Dwellings	1.0	-12.5	-8.8
Domestic demand*	181.3	-0.1	1.0
Exports of goods and services	59.0	-1.8	6.8
Exports of goods	31.7	3.7	5.5
Exports of services	27.4	-7.7	8.3
Imports of goods and services	61.0	0.3	7.2
Imports of goods	53.0	2.6	6.8
Imports of services	8.0	-13.1	9.7
Balance of goods & services (% of GDP)	-1.1		
GDP	177.7	-0.2	1.4
Contributions to the change of real GDP			
Domestic demand*		-0.1	1.0
Balance of goods & services		-0.7	-0.2
Change in inventories		0.5	0.5

Source: National Accounts, ELSTAT (March 2018).

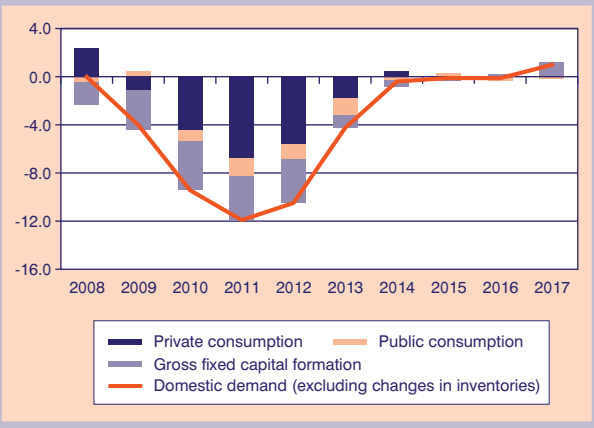
* Excluding inventories.

FIGURE 1.1.1
Contributions to the rate of change of the real GDP

Domestic and net external demand



Individual components of domestic demand



Source: National Accounts, ELSTAT, own calculations.

sumption, which took a negative turn in the second quarter of the year.

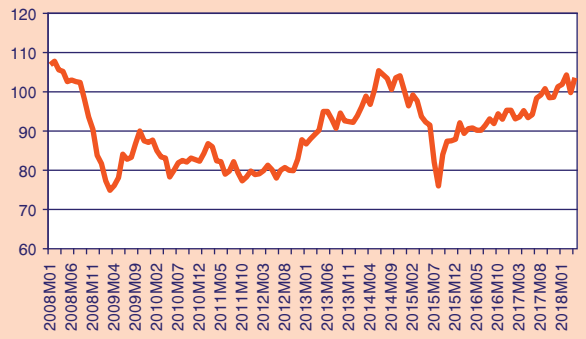
More particularly, concerning the course of the main domestic demand components, gross fixed capital investment recorded a dynamic recovery in the first and fourth quarters of 2017 (by 16.5% and 28.9%, respectively), with its performance, however, being weak in the two intermediate quarters of the year (rate of change of 1.8% in the second quarter and -6.5% in the third quarter. On the other hand, the mild increase in private consumption in the first and second quarters of 2017, (0.9% and 0.8%, respectively, year-on-year), gave turn to a marginal decrease in the third quarter (-0.2%), and a further decline in the fourth quarter of the year (-1.0%). In parallel, public consumption moved downwards from the first to the third quarter of 2017, and increased in the fourth quarter of the year (2.1%). On the basis of these developments, it appears that the benefits from the gradual improvement of the economic environment were limited mostly to the side of fixed capital investment, with pressures on household disposable incomes having clear consequences for consumption, particularly during periods of property and income tax installment payments. On the whole, these developments led to significant fluctuations in the contribution of domestic demand to the rate of change of the GDP, with this contribution finally reaching 1.0 percentage point for the whole year 2017, from -0.1 point in 2016 (see Table 1.1.1 and Figure 1.1.1).

Concerning the course of the external sector in 2017, the improvement of domestic economic conditions, in combination with a number of favourable external factors, contributed towards strong export growth in all four quarters of the year. In parallel, despite the observed decline in private consumption during the second half of 2017, the at times significant recovery of fixed capital investment and the overall positive expectations on the prospects of the economy appear to have contributed towards a continuing rise in imports. On the whole, these developments led to a positive contribution to the rate of change of GDP from the side of exports (2.1 percentage points) and a slightly higher negative contribution from the side of imports (-2.2 points), the result being a contribution of the external sector to the rate of change of the GDP amounting to -0.2 percentage points in 2017, from -0.7 points in 2016.

From the aforementioned evolution in the figures of domestic demand and the external sector, it is evident that developments in inventories played a crucial role in shaping positive GDP growth in 2017. On the basis of the data available, the contribution of the change in stocks to the rate of change of the GDP for 2017 as a whole amounted to 0.5 percentage points, a level similar to that of 2016. The accumulation of stocks is indicative of a certain weakness of domestic demand to sufficiently absorb produced and imported goods, and it may also affect, to a certain degree, the rate of change of the GDP in subsequent quarters, through the coverage of future demand through the consumption of existing stocks.

With respect to the recent course of economic conditions in the country, positive indications are provided by the significant improvement of the economic sentiment indicator from November 2017 to February 2018 (Figure 1.1.2). In March 2018, the indicator recorded a

FIGURE 1.1.2
Economic sentiment indicator



Source: EUROSTAT.

decrease, while in April 2018 the indicator increased once again. The temporary decrease of the indicator in March may perhaps be connected, on one hand, to geopolitical tensions in the wider area of the eastern Mediterranean, and, on the other hand, to a precautionary stance in view of new economic measures and developments related to the completion of Greece's financial assistance programme.

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

The annual rate of change of private consumption amounted to 0.1% in 2017 from -0.0% in 2016, and as a result the contribution of private consumption to the rate of change of the GDP amounted to 0.1 percentage points in 2017, from 0.0 points in the previous year. On a quarterly basis, private consumption recorded, as already mentioned, a mild increase up until the second quarter of 2017, and a decline in the second half of the year.

Additional indications regarding the recent path of private consumption are provided by the evolution of the monthly volume index in retail trade. Following the mostly positive changes of the general index during the period from January to August 2017, the rate of change of the index was negative in September (-0.8%), October (-1.0%) and November 2017 (-2.6%), then again recovering in December 2017 (1.7%). Positive contributions to the development of the general index during the second half of 2017 came from the side of one out of the three main retail sector categories, namely the *non-food* sector (Figure 1.1.3). In contrast, negative developments were recorded in the case of the indices of the *food* sector and the *automotive fuel* sector, with the exception of October.

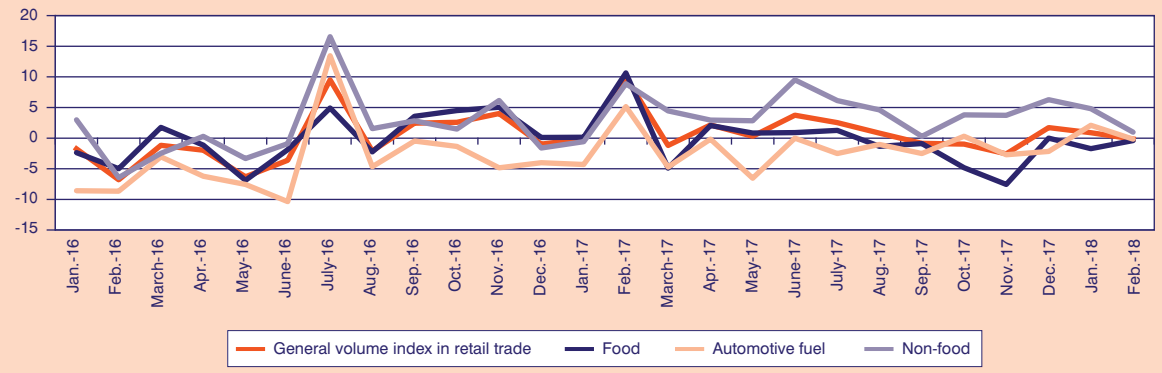
Regarding the relevant developments during the first months of 2018, the general volume index in retail trade recorded an increase in January (0.9%), followed by a marginal decrease in February (-0.1%)[1], as compared to the corresponding months of 2017. The respective course of the general index is further mirrored in the developments in the three main retail categories. More particularly, in the case of the *food* sector, the negative change observed in January (-1.7%) was followed by a milder decrease in February (-0.4%), while in the case of the *automotive fuel* sector, the positive change recorded in January (2.1%) was reversed in February (-0.2%). In the *non-food* sector, the preceding positive trend in the index was preserved, with positive changes recorded both in January (4.8%) and February 2018 (1.0%).

With reference to the evolution of the indices in the eight individual retail store sub-categories, it seems that in the second half of 2017 favorable developments –as compared to the corresponding period of 2016– were mainly related to *furniture-electrical equipment-household equipment* (8.0%), *books-stationery-other books* (5.6%), *pharmaceuticals-cosmetics* (2.5%), *clothing-footwear* (2.3%) and *department stores* (0.4%), On the contrary, adverse developments took place on average over the same period in the indices of the *food-beverages-tobacco* (-2.8%), *automotive fuel* (-1.8%) and *supermarket* (-1.1%) sub-categories. With respect to the corresponding developments in early 2018, in January positive rates of change were recorded in five out of the eight sub-categories (*automotive fuel*, *pharmaceuticals-cosmetics*, *clothing-footwear*, *furniture-electrical equipment-household equipment, books-stationery-other books)*, while in February upward trends were observed in four out of the eight sub-categories (*supermarkets, pharmaceuticals-cosmetics*, *clothing-footwear*, *furniture-electrical equipment-household equipment*).

On the basis of the above data, it is evident that, from mid-2017 and until recently, private consumption has been under the influence of opposing forces, which may prevail one over the other depending not only on the conjuncture, but also depending on the consum-

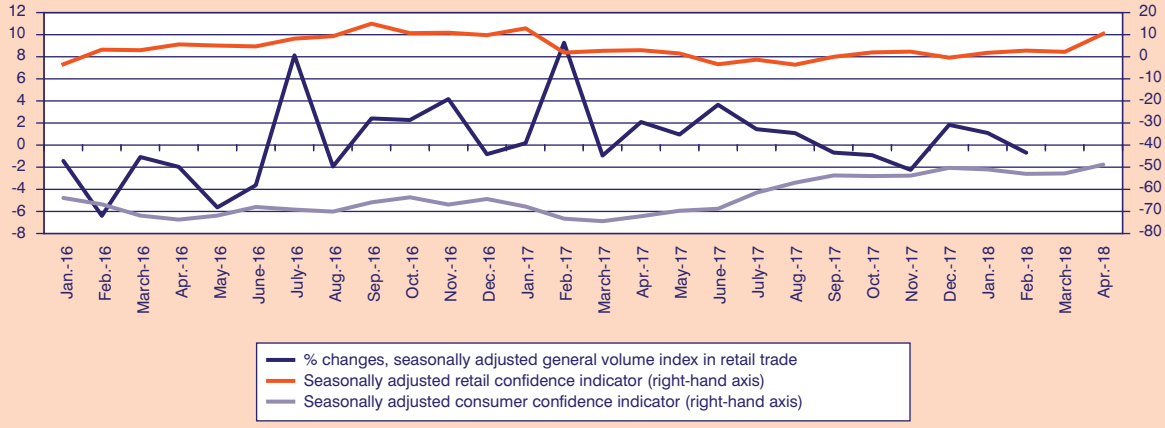
1. The data for February are provisional.

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



Source: ELSTAT, own calculations.

FIGURE 1.1.4
General volume index in retail trade and confidence indicators



Source: ELSTAT, EUROSTAT, own calculations.

er good category in question. On the one hand, the further stabilization of the economic environment, the slow but consistent improvement of the main labour market figures and the related recovery in the compensation of employees gradually dissolve the apprehension of consumers and create more favourable conditions for the recovery of private consumption. On the other hand, the margins of households to consume continue to be negatively influenced by the persisting pressures on their disposable incomes, in the framework of the implementation of fiscal adjustment measures. Under these conditions, a certain degree of uncertainty with respect to the prospects of private consumption continues to prevail, although the wider positive economic prospects seem to point to a potential for a mild recovery of private consumption in the course of the current year. This assessment is in line with recent developments in the consumer confidence and the retail confidence indicators, which reflect an improvement in the expectations of consumers and retailers with respect to the future course of private consumption expenditure (Figure 1.1.4).

1.1.2. Investment

The annual rate of change of gross fixed capital formation amounted to 9.6% in 2017, versus 1.6% in 2016, and as a result the contribution of investment expenditure to the rate of change of the GDP reached 1.1 percentage points in 2017, from just 0.2% in the

previous year. On a quarterly basis, investment exhibited, as already mentioned, considerable fluctuations in the course of 2017, recording a dynamic recovery in the first and last quarters, a weak increase in the second quarter and a decline in the third quarter of the year.

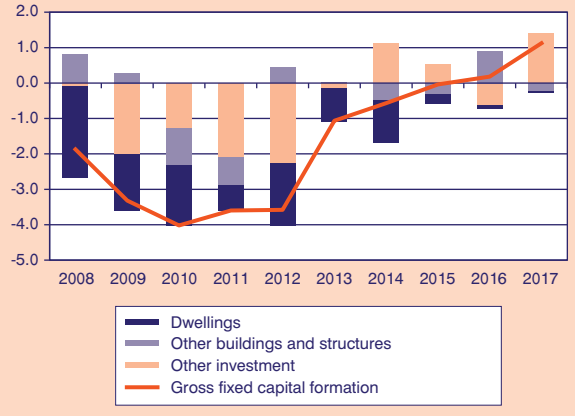
More particularly, with regard to investment other than construction, developments in 2017 were, on the whole, positive, with expenditure in three out of the four relevant categories recording, on average, an increase. More specifically, investment recorded a large increase in the transport equipment category (83.2%), while small increases were also observed in the metal products and machinery category (2.8%) and the agriculture-forestry-fisheries category (0.8%). In contrast, a marginal decrease was observed in the case of investment in other products (-0.3%).

With respect to investment in constructions, 2017 was characterized by a further deceleration of the decline in housing investment (-8.8%). In parallel, the rate of change of expenditure in other constructions turned negative (-5.4%), due to the completion of major construction projects (e.g. highways) which contributed decisively to investment figures in previous years.

Additional information on developments in the construction sector as a whole is derived from the available statistical data on the course of the general production index in construction during the fourth quarter of 2017.[2] As it appears, the index decreased by -21.5% as compared to the corresponding quarter of 2016, thus remaining on the downward track resumed since the second quarter of the year. This development was due both to the decline in the sub-index of production of civil engineering (-28.3%), due to the aforementioned completion of large infrastructure projects, and to the decrease of the sub-index of production of building construction (-13.0%), which reflects developments in the construction of dwellings, industrial and commercial buildings and other buildings.

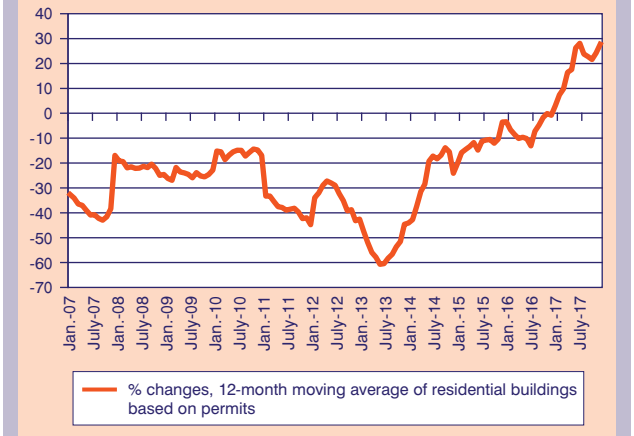
More particular information with regard to the recent developments in residential investment is derived from the residential buildings indicator with respect to square meters of useful floor area, based on building permits. Both the individual monthly observations of the residential buildings indicator and the estimated private building activity[3] exhibited improvement in the most recent reference period. More specifically, the monthly percentage changes of the indicator on a year-on-year basis were positive in October and November 2017 (42.3% and 41.0%, respectively, as to the corresponding months of 2016), while, in parallel, the rates of change of the estimated private building activity remained positive (24.2% in October and 27.7% in November) (Figure 1.1.6). However, as men-

FIGURE 1.1.5
Contributions to the rate of change of the GDP
Individual components of investment



Source: National Accounts, ELSTAT, own calculations.

FIGURE 1.1.6
Estimated residential building activity based on permits

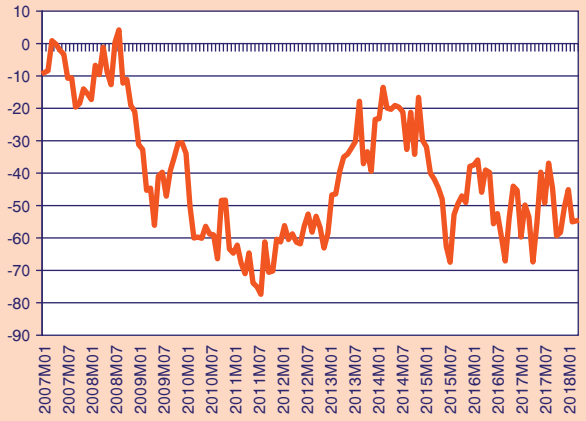


Source: EUROSTAT.

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

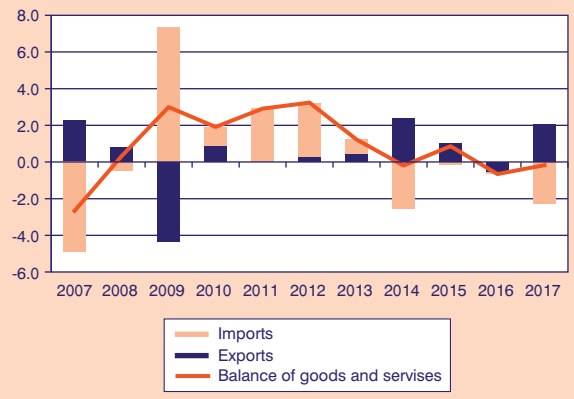
3. A twelve-month moving average and the related percentage point changes are calculated.

FIGURE 1.1.7
Construction confidence indicator



Source: EUROSTAT.

FIGURE 1.1.8
Contributions to the rate of change of the GDP
Individual components of external demand



Source: National Accounts, ELSTAT, own calculations.

tioned in the previous issue of the *Greek Economic Outlook*, caution is recommended with respect to the interpretation of these developments as a sign of positive trends in residential building investment, as according to market sources the increase in residential permits reflects to a considerable extent an increase in the issuing of new permits for the fencing of plots of land, an activity related to the process of the posting of new forest maps.

Overall, the favourable developments in investment for 2017 as a whole, and particularly the rapid recovery observed in the final quarter of the year, point to a gradual establishment of positive investment dynamics in the economy. Nevertheless, the fluctuations of the rate of change of investment in the course of 2017, and also the volatility still characterizing the constructions confidence indicator (Figure 1.1.7), underline the need for a continuous effort to facilitate and encourage investment, through the further stabilization of the economic environment and the implementation of major investment projects that are either in waiting or in progress, as well as the improvement of financing and liquidity in the market through the achievement of stability in the banking system. The prospect of progress in these crucial areas in the course of the current year supports a positive outlook for investment growth over the short term.

1.1.3. External balance of goods and services

Developments in the external sector of the Greek economy in the course of 2017 were favoured considerably by the progressive stabilization of the domestic economy, the growth of international trade, the positive developments in Greece's main export markets and the increasing preference of tourists for holidays in Greece.

More particularly with respect to exports, in the case of services there was a significant increase in all four quarters of 2017. According to data of the Bank of Greece, this development is related not only to the increase in tourism receipts, but also to the rise in receipts from transportation and other services. In the case of goods exports, developments remained positive in all four quarters of the year, with the relevant rate of change being comparatively higher in the second and third quarters. Overall, for the year 2017 as a whole, exports recorded an increase of 5.5% in the case of goods and 8.3% in the case of services; the result being a positive contribution of 2.1 percentage points to the rate of change of the GDP (see Figure 1.1.8).

With respect to imports, a steady upward trend in the course of 2017 was observed both in the case of goods and in the case of services. Thus for the year 2017 as a whole, imports presented a considerable increase in goods (6.8%) and in services (9.8%); the result being a negative contribution of -2.2 percentage points to the rate of change of GDP.

Concerning the outlook for the external sector, the indications thus far available, together with the positive prospects for international trade and for developments in European economies, point to the prospect for a continuation of the rising trend in goods and services exports. In parallel, a rising trend is expected to prevail in the case of imports, due to the foreseen recovery of domestic demand. Under these

circumstances, the contribution of the external sector to the rate of change of GDP will depend critically upon the scale of export growth, as well as upon the degree to which an increase in internal demand will be covered by domestically produced goods. In the current conjuncture, a decisive role in the country's performance in the above fields will be played by the implementation of the new investment necessary for the strengthening of the country's productive capacity.

1.1.4. Conclusions

The above analysis of developments in the main demand components provides signs of positive growth dynamics for fixed capital investment and exports in the Greek economy, together with a prospect of a mild recovery in private consumption over the short term. This picture is in support of a positive outlook of accelerating recovery in Greece's GDP during 2018, in line also with the forecasts derived on the basis of the KEPE dynamic factor model (see Section 1.3).

KEPE, *Greek Economic Outlook,* issue 36, 2018, pp. 11-13

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

Yannis Panagopoulos

The existing trend of the Greek headline Consumer Price Index (CPI), after January 2018, has stopped exhibiting positive changes (see column of Table 1.2.1 and Diagram 1.2.1). Actually, the uninterrupted positive changes experienced between January 2017 and December 2017 ceased to exist after January 2018. More specifically, in January 2018 and up to April 2018, the headline CPI crosses continuously from negative to positive changes on a monthly basis. However, the last recorded CPI change was zero (0.0%, April 2018). On the other hand, the core of the headline CPI exhibited the same behavior, though with a higher variation. Additionally, this behavior was lagged one period (month) with respect to the headline CPI (from December 2017).

A similar fall, like the one of the headline CPI, is recorded by the Greek harmonized CPI (HCPI). The only difference is that this index has exhibited only positive changes, between 0.2% and 0.5%, from December 2017 onwards. Unlike the headline CPI, its core, with the exception of October 2017 (0.2%), moves steadily with changes between 0.6%-0.8%. This result leaves some optimism for the return of the harmonized CPI, at least in changes similar to the corresponding one of the Eurozone.

Additionally, according to the Hellenic Statistical Authority (ELSTAT), the aforementioned headline inflation rate (0.0%, y-o-y, in April 2018) can be mainly attributed to subsequent price decreases in six (6) main sub-categories, namely:

(a) the "Food and non-alcoholic beverages" category (by 1.0%), due to price decreases mainly in bread and cereals, beef, pork, poultry, fresh fish, fresh fruits, fresh vegetables and potatoes. Part of this decrease was offset by increases in the prices of coffee and fresh milk,

(b) the "Clothing and Footwear" category (by 0.4%) due to price decreases for these products,

(c) the "Housing" category (by 1.2%) due to decreases in rents, electricity bills and gas. Part of this decrease was offset by the increases in the prices of residential heating,

(d) the "Household equipments" category (by 1.8%) mainly due to decreases in the prices of furniture,

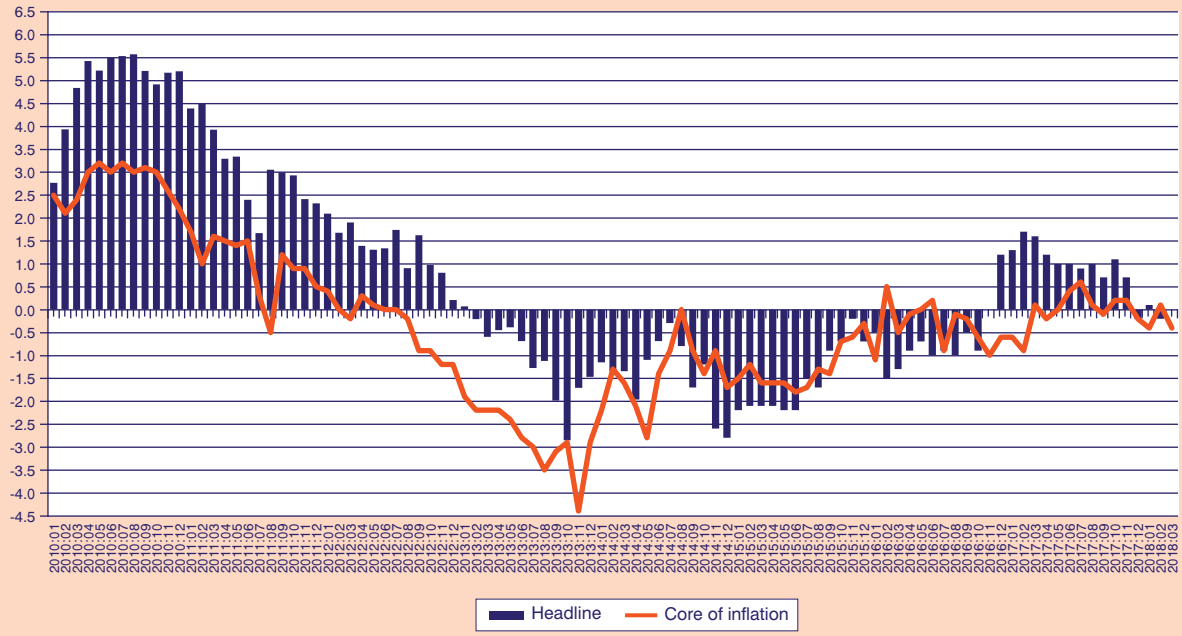
TABLE 1.2.1 Inflation in Greece and in the Eurozone

	Headline inflation (Greece)	Core inflation (Greece)	Harmonized inflation (Greece)	Core harmonized inflation (Greece)	Harmonized inflation (EU19)	Core harmonized inflation (EU19)
2017M9	1.0	-0.1	1.0	0.6	1.5	1.3
2017M10	0.7	0.2	0.5	0.2	1.4	1.1
2017M11	1.1	0.2	1.1	0.7	1.5	1.1
2017M12	0.7	-0.2	1.0	0.8	1.4	1.2
2018M1	-0.2	-0.4	0.2	0.6	1.3	1.2
2018M2	0.1	0.1	0.4	0.8	1.1	1.2
2018M3	-0.2	-0.4	0.2	0.6	1.3	1.3
2018M4	0.0	NA	0.5	NA	NA	NA

Source: ELSTAT, EUROSTAT.

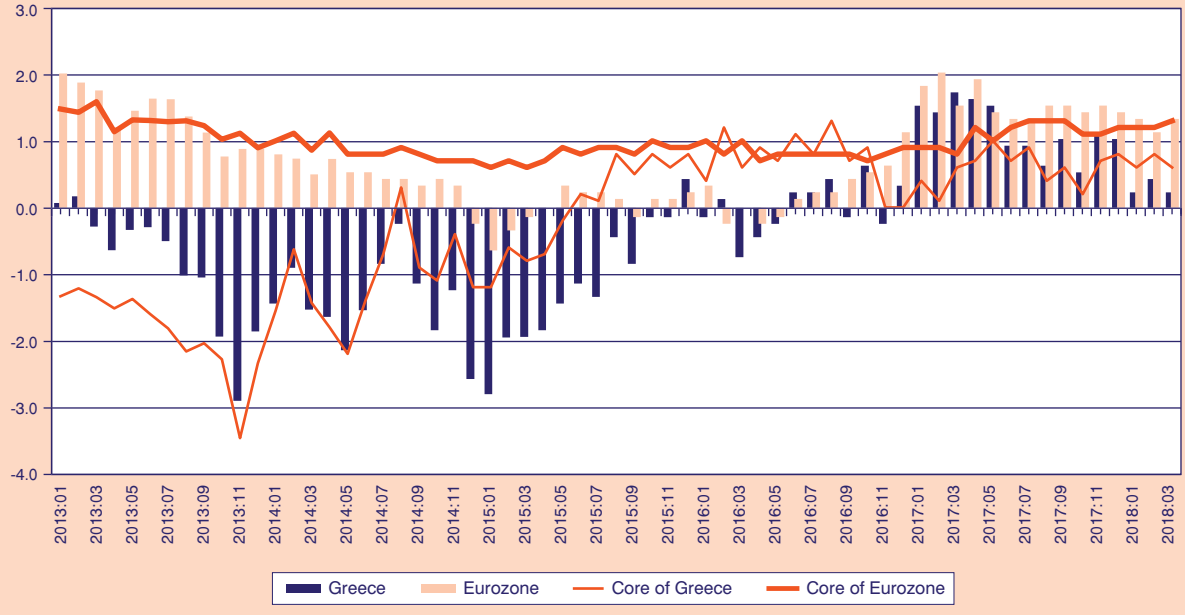
Note: NA: Data not available.

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



Source: ELSTAT.

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



Source: ELSTAT, EUROSTAT.

household textile products and in household consumption items,

(e) the "Recreation and culture" category (by 1.3%) mainly due to decreases in the prices of audio and visual equipments of PCs as well as other durable recreation goods and services,

(f) the "Miscellaneous goods and services" category (by 1.3%) basically due to reductions in the prices of personal care products.

Part of the aforementioned zero inflation rate was offset by the increase in the prices mainly of six (6) sub-categories, namely:

(a) the "Alcoholic, drinks and tobacco" category (by 3.3%) basically due to price increases in tobacco,

(b) the "Health" category (by 0.1%) especially due to price increases in pharmaceutical products, hospitals and clinics. Part of this increase was offset by the decreases in prices of dentistry services.

(c) the "Transportation" category (by 1.6%) mainly due to increases in the prices of airplane tickets, gasoline, and petrol. Part of this increase was offset by the decreases in the prices of the maintenance and repair of personal transport equipments,

(d) the "Communication" category (by 3.3%) mainly due to increased fees for telephone services,

(e) the "Education" category (by 0.2%) mainly due to increases in the fees for secondary schools,

(f) the "Restaurants-Hotels-Cafés" category (by 1.4%) mainly due to increases in their prices.

As regards to the harmonized CPI of the euro area (HCPI-EU19), we can report that in the last several (9-10) months it has been moving with an upward trend, ranging from 1.3% to 1.5% (1.3%, March 2018). This inflationary rate is not far from the ECB target rate (almost 2.0%). During the same period, the core inflation of HCPI-EU19 (which does not include unprocessed food and energy) has also continued to move with an upward trend, ranging from 1.1% to 1.3%.

On the other hand, from Diagram 1.2.2, we can observe that after December 2017 and up to now (April 2018) the Greek HCPI has been moving with a percentage rate which deviates from that of the HCPI-EU19 one. The core, however, appears with a smaller difference from the corresponding rate of the Eurozone (see Diagram 1.2.2). In conclusion and based on the evidence of the last few months (from January 2018 onwards), we infer that the rates of change of the Greek HCPI and its core are deviating from the corresponding Eurozone's rates.

KEPE, *Greek Economic Outlook,* issue 36, 2018, pp. 14-15

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 2018.[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 December 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 estimates presented in Table 1.3.1, and having incorporated published (provisional) seasonally adjusted GDP data up to the fourth quarter of 2017, the mean annual rate of change of real GDP for 2018 is predicted at 2.1%. This forecast reflects an improvement in economic conditions, as compared to the official[3] rate of change of real GDP for 2017, amounting to 1.4%. In addition, the rates of change for the first and second half of 2018 are estimated at 2.0% and 2.2%, respectively. It follows that the present factor model forecast for the first half of 2018 incorporates an upward revision of the corresponding forecast of the preceding period of reference (1.7%), while it also uncovers a tendency towards a moderate enhancement of the growth rate during the second half of 2018. This trend is further mirrored in the estimated quarterly growth rates for 2018, as compared to the respective four quarters of 2017, predicted at 2.4%, 1.6%, 2.0% and 2.4%.

TABLE 1.3.1 Real GDP rate of change for 2018 *(%, y-o-y)*

	2018			
Quarters	**2018Q1**	**2018Q2**	**2018Q3**	**2018Q4**
Quarterly rate of change	2.41 [2.34 , 2.48]	1.61 [1.49 , 1.74]	2.01 [1.83 , 2.19]	2.36 [2.12 , 2.59]
Mean rate of change, 1st and 2nd half of 2018	2.01 [1.92 , 2.11]		2.18 [1.98 , 2.39]	
Mean annual rate of change	2.10 [1.95 , 2.25]			

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

1. The date of the forecast is May 4, 2018.
2. The TRAMO/SEATS filter was used for the seasonal adjustment.
3. According to the most recent publication by ELSTAT for the Quarterly National Accounts, dated March 5, 2018.

The above presented forecasts of the rate of change of real GDP for 2018 reveal the key aspects of the most recent short-term developments in the Greek economy and are in line with the course of the incorporated economic data referring to the last quarter of 2017. In particular, the upward trend in the GDP growth rate recorded during the last quarter of 2017 seems to be carried over to the first quarter of 2018, while it appears that a correction occurs in the second quarter, interrupting the increasing path, which is then reinforced during the second half of 2018. These predictions indicate that the conditions are now provided for the gradual recovery and stabilization of the Greek economy. Such a development is associated, on the one hand, with the favourable course of certain major macroeconomic components, alongside the –stronger than expected– economic recovery in Europe and worldwide, as well. On the other hand, it is linked to (a) the positive effects arising from the rebalancing of major fiscal aggregates over time and the implementation of crucial structural reforms, securing the basic financing conditions for the Greek economy and (b) the prospects for the final completion of the fiscal adjustment programmes, as well as for a potential arrangement with reference to the issue of the Greek debt. At the same time, the lack of indications for stronger growth dynamics in the country could be due to delays in the legislation and implementation of certain economic measures, but mainly to the overall financial burden weighing on households and enterprises.

The above findings and assessments are consistent with the recent upward course of a significant number of economic variables, as observed on the basis of the latest data, on a non-seasonally adjusted basis, for the last quarter of 2017. More specifically, indicative are the favorable developments in: (a) investment (excluding housing), (b) goods and services' exports, (c) industry, based on both the general industrial production index and individual index categories (apart from the category of energy and capital goods), as well as the general turnover index in industry (overall and, in particular, for the external market, in the latter case with the exception of capital goods), (d) travel and transport receipts, (e) passenger cars and motorcycles, according to private passenger car licenses issued and the turnover index for motor trade, (f) building activity, in terms of volume, on the basis of permits issued, (g) wholesale trade, on the basis of the turnover index, (h) the Athens stock exchange, according to the General Index, and (i) spreads, which declined significantly.

An upward course also characterized most of the indicators reflecting business expectations on a sectoral level, especially in manufacturing, as well as some of the indicators incorporating the assessments for new and anticipated orders in industry and exports, and also the overall economic sentiment indicator for Greece. Furthermore, of great importance is the continuation of the gradual reduction in unemployment (on an aggregate level, for the long-term and newly unemployed) and the preservation of the increasing trend in employment (on an aggregate level, but also in the three individual sectors, and especially in the secondary sector), despite the overall adverse conditions still characterizing the domestic labour market.

On the negative side,[4] significance is attached to the downward course of the major macroeconomic component of private consumption, while downward trends also characterized the volume index in retail trade (mostly the general index and, in particular, the individual index categories for department stores and supermarkets), the turnover index in industry for the domestic market, as well as individual indicators concerning construction, such as the production index in construction. In addition, most of the competitiveness indicators considered did not record any significant improvement.

Greek real GDP and the overall domestic economic conditions may evolve according to a more or less favourable –than indicated by the above presented forecasts– scenario during 2018, depending on certain critical and decisive developments which concern a wide range of factors. These are associated, on the one hand, with the course of the major GDP components: private consumption, to boost domestic demand, but also investment and exports to strengthen the key economic sectors in the country, with the aim to enhance growth dynamics in the medium- to long-term and secure the creation of new jobs. On the other hand, they relate to the prospects of the country being able to raise funding directly from financial markets in the summer of 2018 and to settle the issue of the Greek debt. At the same time, these factors concern all the possibly adverse effects arising from the implementation of economic measures, incorporating significant additional financial burdens for households and enterprises and exerting further pressure on their tax-paying and financial capacity. They further concern potential downward risks related to any worsening of geopolitical tensions or of the overall global economic and political environment.

4. Here again, the ascertainments refer to the course of the variables on a non-seasonally adjusted basis.

KEPE, *Greek Economic Outlook,* issue 36, 2018, pp. 16-19

1.4. The international environment: Recent developments and prospects of the global economic activity

Aristotelis Koutroulis

The global economy is on a path of steady growth. Although GDP growth rates vary across regions, economic expansion remains highly synchronized among advanced economies. Downside risks to the global economic outlook are increasing.

1.4.1. Trends and developments in the global economy

Economic activity

According to international organizations the global economy will maintain its momentum with the annual GDP growth rate reaching 3.9% over the next two years (see Table 1.4.1). Amid a favorable investment climate that prevails in most developed and developing economies, growth will find support from higher private consumption and stronger fixed capital formation. On the supply side, increasing manufacturing activity linked to international trade expansion will play a positive role as well.

Although the global economy seems to be on a steady growth path, vulnerability to downside risks persists. These risks are related to: (a) the escalation of protective measures against international trade, (b) the sudden adjustment of the market prices of tangible and intangible assets, (c) unexpected changes in the monetary policy of advanced economies; and (d) the persistence of public debt at high levels in a large number of national economies. As in the past, the buildup of tensions in 'sensitive' geographic areas, like the Middle East or the Korean Peninsula, remains a major source of uncertainty threatening the smooth function of the global economy.

Inflation and unemployment

Compared to 2017, CPI inflation in advanced economies is expected to increase marginally this year and

TABLE 1.4.1 Real Gross Domestic Product[1,2] *(annual percentage changes)*

	2017*				2018**				2019**			
	IMF	**EC**	**UN**	**OECD**	**IMF**	**EC**	**UN**	**OECD**	**IMF**	**EC**	**UN**	**OECD**
World economy	**3.8**	**3.7**	**3.7**	**3.7**	**3.9**	**3.9**	**3.9**	**3.9**	**3.9**	**3.9**	**3.8**	**3.9**
Advanced economies	**2.3**	**:**	**2.3**	**:**	**2.5**	**:**	**2.2**	**:**	**2.2**	**:**	**2.1**	**:**
USA	2.3	2.3	2.3	2.3	2.9	2.9	2.5	2.9	2.7	2.7	2.3	2.8
Euro Area	2.3	2.4	2.3	2.5	2.4	2.3	2.1	2.3	2.0	2.0	1.9	2.1
Japan	1.7	1.7	1.7	1.7	1.2	1.3	1.6	1.5	0.9	1.1	1.5	1.1
United Kingdom	1.8	1.8	:	1.7	1.6	1.5	:	1.5	1.5	1.2	:	1.1
Developing economies	**4.8**	**:**	**4.6**	**:**	**4.9**	**:**	**4.8**	**:**	**5.1**	**:**	**4.8**	**:**
Brazil	1.0	1.0	1.0	1.0	2.3	2.4	2.4	2.2	2.5	2.6	2.7	2.4
Russia	1.5	1.5	1.5	1.5	1.7	1.7	1.7	1.8	1.5	1.6	1.7	1.5
India	6.7	6.4	6.7	6.6	7.4	7.4	7.5	7.2	7.8	7.6	7.6	7.5
China	6.9	6.9	6.9	6.9	6.6	6.6	6.5	6.7	6.4	6.3	6.3	6.4

Source: IMF, *World Economic Outlook,* April 2018; OECD, *OECD Interim Economic Outlook,* March 2018; European Commission, *European Economic Forecast,* Spring 2018; United Nations, *World Economic Situation and Prospects 2018* (Update as of mid-2018).

* Estimations, ** Projections.

1. The observed differences between the available macroeconomic projections partly reflect the differences between the macroeconometric models and the data used by each international organization.

2. The sub-group of emerging economies is included in the group of developing economies.

TABLE 1.4.2 Inflation[1]
(annual percentage changes)

	2017		2018*		2019*	
	IMF	EC	IMF	EC	IMF	EC
Advanced economies	**1.7**	**:**	**2.0**	**:**	**1.9**	**:**
USA	2.1	2.1	2.5	2.2	2.4	2.2
Euro Area	1.5	1.5	1.5	1.5	1.6	1.6
Japan	0.5	0.5	1.1	1.0	1.1	1.1
United Kingdom	2.7	2.7	2.2	2.5	2.2	1.9
Developing economies	**4.0**	**:**	**4.6**	**:**	**4.3**	**:**
Brazil	3.4	:	3.5	:	4.2	:
Russia	3.7	:	2.8	:	3.7	:
India	3.6	:	5.0	:	5.0	:
China	1.6	:	2.5	:	2.6	:

Source: IMF, *World Economic Outlook,* April 2018; European Commission, *European Economic Forecast,* Spring 2018.

* Projections.

1. The sub-group of emerging economies is included in the group of developing economies.

TABLE 1.4.3 Annual unemployment rates

	Unemployment rate			Unemployed (million)		
	2017	2018*	2019*	2017	2018*	2019*
World economy	**5.6**	**5.5**	**5.5**	**192.7**	**192.3**	**193.6**
Advanced economies	5.7	5.5	5.4	34.1	32.8	32.4
Developing economies	5.3	5.3	5.3	15.6	16.1	16.6
Emerging economies	5.6	5.5	5.5	143	143.4	144.6

Source: International Labour Office, *World Employment Social Outlook, Trends 2018*.

* Projections.

stand around 2% (see Table 1.4.2). As the core of inflation is not expected to register significant changes, the marginal acceleration of headline inflation in the developed world will be driven by energy and other commodity prices. Similar trends seem to characterize price developments in emerging economies with inflation projected to stand around 4.6%. For 2019, a slight decline in inflation is expected in both advanced and emerging economies. The 2019 projection is based on the assumption that the upward trend in international oil prices will be reversed over the course of the next year.

The latest reports of the international organizations point to a generalized improvement of labor market conditions across most regions of the world. To a certain extent, this conclusion is also confirmed by the International Labor Office's estimates regarding the course of unemployment rates in advanced and developing economies (see Table 1.4.3). However, the projected annual changes of unemployment do not seem to closely follow the corresponding changes in economic activity, suggesting the presence of hysteresis effects.

1.4.2. Economic developments across the Globe

Advanced economies

A high degree of synchronization of economic expansion is expected to enable the group of advanced economies to sustain GDP growth at an estimated 2.3% over the next two years.

US: According to recently published economic indicators, the US economy is operating close to its full capacity. Unemployment has fallen to 4.1% while the ratio of job creation to job seekers has reached its highest level since 2000. As improved economic performance owns largely to fiscal stimulus, one naturally wonders whether expansionary fiscal policy will have a temporary or a more permanent character. In the second case, a combination of expansionary fiscal policy with a rise in the Fed's policy rates could be possibly interpreted as a sign of the US authorities' willingness to re-establish their economy as a global absorber of trade surpluses created in other regions of the world.

Eurozone: Growth is forecast at 2.3% this year, as both domestic and external demand will continue strengthening. Improving labour market conditions and households' increasing disposable income should support further increases in private consumption while loose monetary policy is expected to give a further boost to business investment and construction. Regarding prices, headline inflation is projected to remain at 1.5%. Although this assessment suggests no inflationary pressures, most analysts expect that the ECB will start withdrawing its unconventional policy measures in 2019. Monetary policy normalization is projected to slow down GDP growth by 0.2 to 0.4 percentage points in 2019.

Japan: Strengthening domestic and external demand will underpin growth in 2018. Domestic demand will be supported by rising business profitability and higher real wages due to labour market pressures. Over the forecasting period, the major risk threatening the Japanese economy is related to the possibility of a large appreciation of the Japanese yen and its negative impact on the country's exports.

United Kingdom: Unlike the majority of non-euro-area European countries, economic growth in the UK is seen to moderate to 1.5% this year and 1.2% next year, from 1.8% in 2017. These projections reflect the weakness of the British economy to exploit its particularly favorable external environment due to the great uncertainty surrounding the country's exit conditions from the European Union.

Developing economies

Emerging and developing economies are forecast to continue to expand robustly with GDP growth picking up to 4.9% in 2018. As usual, economic growth rates are expected to be particularly strong in the two drivers of the developing world, namely China and India (see Table 1.4.1). In these two countries the most likely drivers of growth over the forecasting horizon will be private consumption, public spending and exports. Regarding the rest of the developing world, economic growth is projected to vary across regions depending

TABLE 1.4.4 World trade volume[1]
(annual percent changes)

		2016	2017	2018*	2019*
World trade volume (goods and services)		**2.3**	**4.9**	**5.1**	**4.7**
Imports	Advanced economies	2.7	4.0	5.1	4.5
	Developing economies	1.8	6.4	6.0	5.6
Exports	Advanced economies	2.0	4.2	4.5	3.9
	Developing economies	2.6	6.4	5.1	5.3

Source: IMF, *World Economic Outlook, Update,* April 2018.

* Projections.

1. The sub-group of emerging economies is included in the group of developing economies.

on the economic fundamentals of each economy and the particular circumstances that will prevail. For instance, the upward-trending energy prices, along with the organization of the upcoming 2018 FIFA World Cup, are expected to provide a further boost to the Russian economy this year. By the same token, Brazil is expected to benefit from increasing commodity prices.

1.4.3. World trade and commodity prices

For a second consecutive year international trade will likely remain the primary mechanism transmitting the benefits of global economic expansion across different regions. Backed by rising manufacturing activity, increased demand for consumer goods and stronger business investment, the expansion rate of international trade will reach 5.1% in 2018 from 4.9% in 2017 (see Table 1.4.4 above).

Regarding commodity prices, the increased global demand for metal and energy products is expected to keep the prices of these products on an upward trend. As for crude oil, according to the latest forecasts of international organizations, prices are expected to average at about $67 per barrel in 2018.

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KEPE, *Greek Economic Outlook,* issue 36, 2018, pp. 20-25

1.5. Recent economic developments in the Western Balkan Region

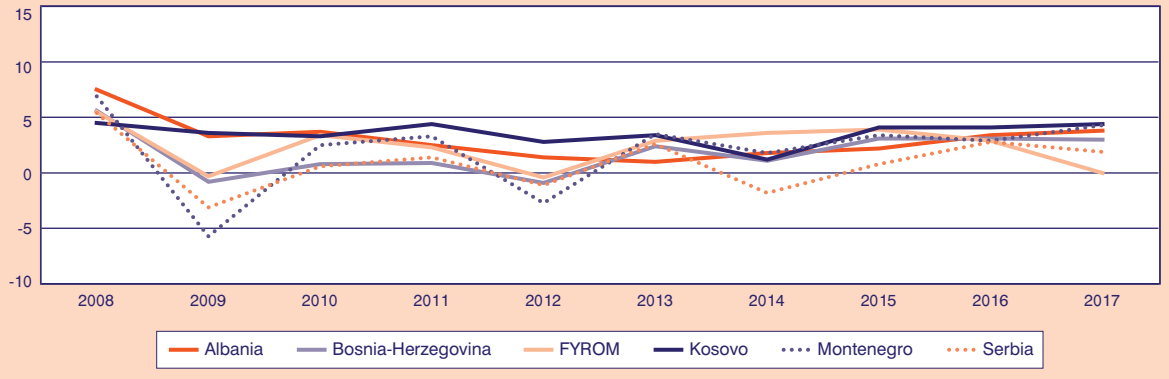
Ritsa Panagiotou

1.5.1. Growth

Real GDP growth in the Western Balkan countries slowed from 3.1 percent in 2016 to an estimated 2.4 percent in 2017, due to weaker growth in Serbia and FYROM (Figure 1.5.1). In Serbia, GDP growth fell from 2.8 percent in 2016 to 1.9 percent in 2017, due to a severe winter and a summer drought that led to a significant decline in energy production as well as in agricultural production (nearly 10 percent). The fast growth of imports –particularly imports of oil and food– was offset by an only modest increase in exports. Although industrial output and services recovered in 2017 –with growth in trade, transport and tourism– this was not enough to compensate for the fall in agricultural production. Private consumption was an important source of growth, spurred by rising employment, growing credit to households and higher wages. In the Former Yugoslav Republic of Macedonia (FYROM), the prolonged political turmoil of 2015-17 led to a steep decline in public and private investment, which contributed to a slowdown of growth to zero, down from 2.9 percent in 2016. Private consumption was the only contributor to growth in 2017, supported –as was the case in Serbia– by higher employment, growing credit to households and higher wages.

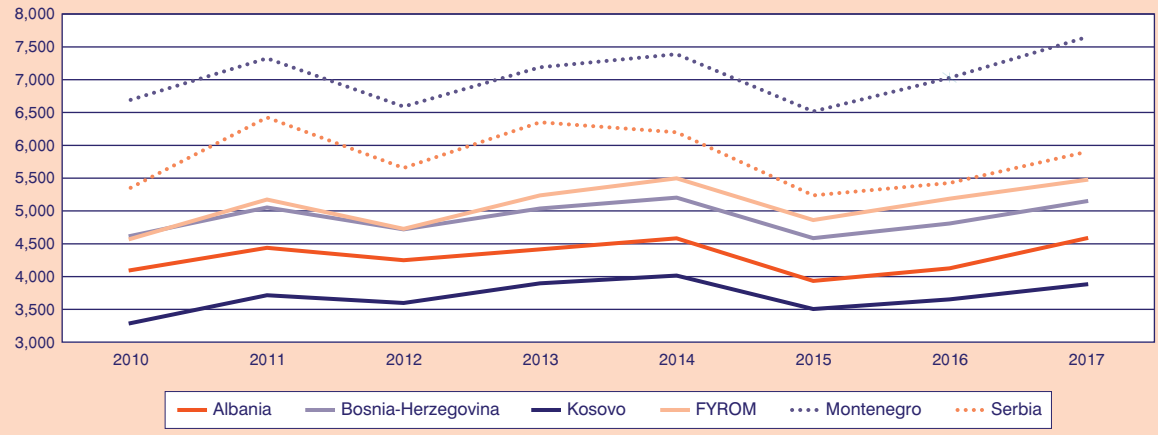
However, Bosnia-Herzegovina, the second largest economy in the region, grew steadily by an estimated 3 percent, and the dynamism of the smaller economies also helped drive regional growth. In Bosnia-Herzegovina growth was driven largely by private consumption, investment and services growth. Albania's real GDP grew by 3.8 percent in 2017, mainly driven by private investment and consumption. Investment dynamics were mainly related to two large energy projects financed by foreign direct investment: the Trans Adriatic Pipeline and the Devoll hydropower plant. A sustained recovery in employment, wages and household credit boosted private consumption. Tourism exports and recovering commodity exports more than compensated for a surge in investment-related imports of machinery and equipment and in drought-related energy imports. Kosovo's GDP grew by an estimated 4.4 percent in 2017, driven mainly by increased public and private investment and a recovery in exports. Exports, building on higher prices for base metals and higher production and higher services exports, added 3.6 pp to growth. Private investment was encouraged by a more attractive business environment, better financing options, and more FDI inflows; public investments contributed 3 pp to growth, up from 2.1. Expansion in services (especially construction, trade, finance and transport) added 2.6 pp to growth, while agriculture and industry contributed only 0.4 pp and 0.7 pp, respectively. Finally, Montenegro's economy grew an estimated 4.3 percent in 2017, stimulated by household consumption and investment: investment contributed 5 pp, as construction of the Bar-Boljare Highway and residential construction accelerated, while consumption also

FIGURE 1.5.1
Western Balkans, GDP (% change)



Source: IMF, *World Economic Outlook,* April 2018.

FIGURE 1.5.2
Western Balkans, GDP per capita (US$)



Source: IMF, *World Economic Outlook,* April 2018.

grew, supported by employment and wage growth, adding 3.7 pp to GDP growth.

After contracting sharply in 2015, GDP per capita grew steadily in all Western Balkan countries over the following two years: in Albania, GDP per capita grew from USD 3,935 in 2015 to USD 4,582 in 2017; in Bosnia-Herzegovina, from USD 4,586 to USD 5,148; in FYROM, from USD 4,860 to USD 5,474; in Kosovo, from USD 3,506 to USD 3,880; in Montenegro, from USD 6,517 to USD 7,647 (the highest in the region); and in Serbia, from USD 5,237 to USD 5,899 (Figure 1.5.2).

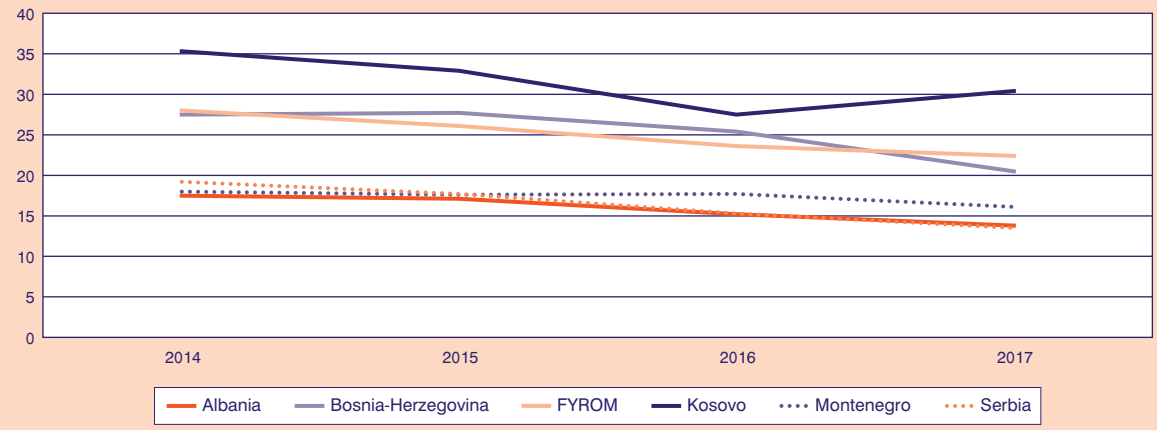
1.5.2. Employment

Unemployment declined in all countries in the region except Kosovo (Figure 1.5.3). As of September 2017, there were 1.24 million people unemployed – 5.6 percent fewer than a year earlier. During the same period, about 190,000 new jobs were created in the Western Balkans, with employment going up in all countries. The average employment rate in the Western Balkans has been increasing by 1.2 pp annually, reaching 44.2 percent in September 2017. In all the Western Balkan countries –except Kosovo– services accounted for over 80 percent of new jobs in 2017 (most of which were in wholesale and retail trade). Youth unemployment in the Western Balkans declined to 31.5 percent in September 2017 (307,000 fewer young people unemployed), 6 pp below the September 2016 rate.

In Albania, employment grew by 3.3 percent in 2017, following its impressive expansion of 6.5 percent in 2016. Labour force participation increased to 58.3 percent. In 2017 the unemployment rate declined by 1.4 pp to 13.6 percent –an historical low for the country. At 26 percent, youth unemployment in Albania is the lowest in the region. Unemployment in Bosnia-Herzegovina fell from 25.4 percent in 2016 to 20.5 percent in 2017, which was the largest decline in unemployment in the region during that period. However, this was due, to a large extent, to declining labour force participation as people emigrated or stopped searching for work. Moreover, although long-term unemployment in Bosnia-Herzegovina decreased by nearly 3.4 pp in 2017, at 82 percent it is still a very high percentage of the unemployed. Employment in 2017 stood at a low 33.9 percent. Most of the expansion in employment originated in agriculture and the services sector, while industrial employment went down in absolute terms.

In FYROM, employment grew by 2.4 percent in 2017, partly helped by subsidies in the first half of the year that facilitated the creation of more than 5,000 jobs (the policy was discontinued by the new government after July 2017). However, at 44.5 percent, the employment rate is still low. Most of the jobs created were in wholesale and retail trade, transport and storage and manufacturing –the sectors most linked to the FDI projects that benefit from tax exemptions and other government support. The unemployment rate fell to an historical low in 2017, 22.4 percent –of which 81 percent is long term– while youth unemployment declined by 1.5 pp to 46.7 percent. In Kosovo, higher growth fostered job creation in 2017. Labour force participation increased by 3.8 pp, and employment grew by 1.7 pp, although unemployment also increased (by 3.3 pp) reaching 30.4 percent as more people,

FIGURE 1.5.3
Western Balkans, Unemployment (% change)



Source: IMF, *World Economic Outlook,* April 2018.

particularly youth, entered the labour force at a faster pace than that of the creation of new jobs. Over 70 percent of unemployment is long term, and employment is still only 29.7 percent. Employment went up in information, manufacturing, agriculture wholesale and retail trade, communications, and administrative activities and support services. Youth unemployment dropped from 52.4 in 2016 to 51.6 percent. Kosovo was the only country in the region where industry –and not services– was the most important factor in employment growth, and a major impetus came from greater demand for Kosovar metal from the EU.

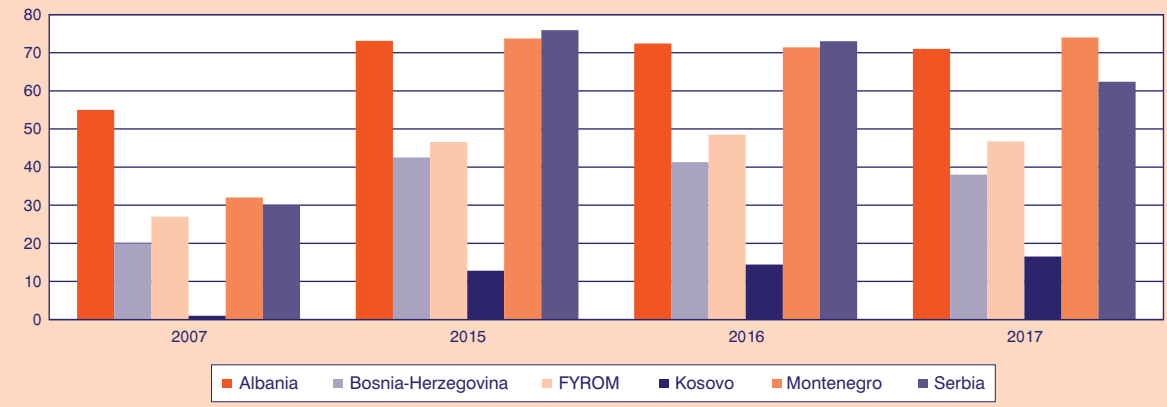
In Montenegro, employment increased by 2.3 percent, reaching 45.9 percent in 2017. The unemployment rate declined from 17.7 percent in 2016 to 16.1 percent in 2017 and youth unemployment decreased from 36.1 percent to 32 percent during the same period. In Serbia, despite the negative impact of the weather on agricultural activity, employment increased by about 3 percent in 2017 compared to the previous year. The average 2017 employment rate reached a record high of 46.7 percent, led by services, which created 33,000 new jobs (a quarter of them in wholesale and retail trade) spurred by higher consumption and fast-growing services exports. Manufacturing created another 23,700 jobs (a 6 percent increase in employment in this sector). Additional impetus came from greater demand from the EU for Serbian automotive products. Moreover, the number of registered entrepreneurs went up by 5.9 percent in 2017. Unemployment fell from 15.3 percent in 2016 to 13.5 percent in 2017, which was the lowest rate in the region. Youth unemployment also fell from 35.0 percent to 32.0 percent in the same period.

1.5.3. Fiscal balances

Although most countries took in more revenue (mostly through improved tax collection), few used the opportunity to improve fiscal balances: in most cases, higher revenue led to higher spending and higher deficits in the region, except in Serbia and Bosnia-Herzegovina, where continued consolidation efforts combined with lower subsidies to state-owned enterprises led to fiscal surpluses in 2017. By contrast, Montenegro recorded the largest increase ever in its deficit –2.3 percent of GDP– driven by extra spending on the construction of Bar-Boljare highway. However, in 2017 it introduced reforms to contain current spending, abolish untargeted social benefits and reduced spending on public wages. Albania increased public investment activity (public infrastructure and energy subsidies), FYROM chanelled extra spending on health, pensions, subsidies and social assistance, while Kosovo chose to increase pensions and benefits to war veterans, as well as public investment, e.g. on the Route 6 motorway.

Countries that undertook fiscal consolidation saw public debt ease (Figure 1.5.4). A combination of economic growth, fiscal discipline and active debt management in 2017 brought down the share of public and publicly-guaranteed (PPG) debt in Serbia, Albania, FYROM and Bosnia-Herzegovina. Between 2016 and 2017, PPG debt fell from 73.0 percent to 62.4 percent of GDP in Serbia, 72.4 percent to 71.0 percent in Albania, 48.5 percent to 46.7 percent in FYROM, and 41.3 percent to 38.0 percent in Bosnia-Herzegovina. On the contrary, Montenegro's PPG debt increased from 71.4 percent of GDP to 74.0 percent, and Koso-

FIGURE 1.5.4
Western Balkans, Public debt (% of GDP)



Source: IMF, *World Economic Outlook,* April 2018.

vo's PPG debt, while still the lowest in the region (16.5 percent of GDP in 2017), has been on a continuing upward trend since 2014.

1.5.4. Credit

In 2017, credit outstanding increased everywhere in the region, except in Albania. In Kosovo, the growth of credit to the private sector was particualrly strong, over 11 percent in 2017, as private demand grew with better market conditions and lower interest rates. In Montenegro, accelerating private sector credit growth exceeded 6 percent in December 2017, as confidence improved and there was a vigorous growth in deposits, a major source of funding for local banks. At 3 to 7 percent, lending remained robust in Bosnia-Herzegovina and FYROM, while credit growth was almost zero in Albania, mostly because of loan write-offs.

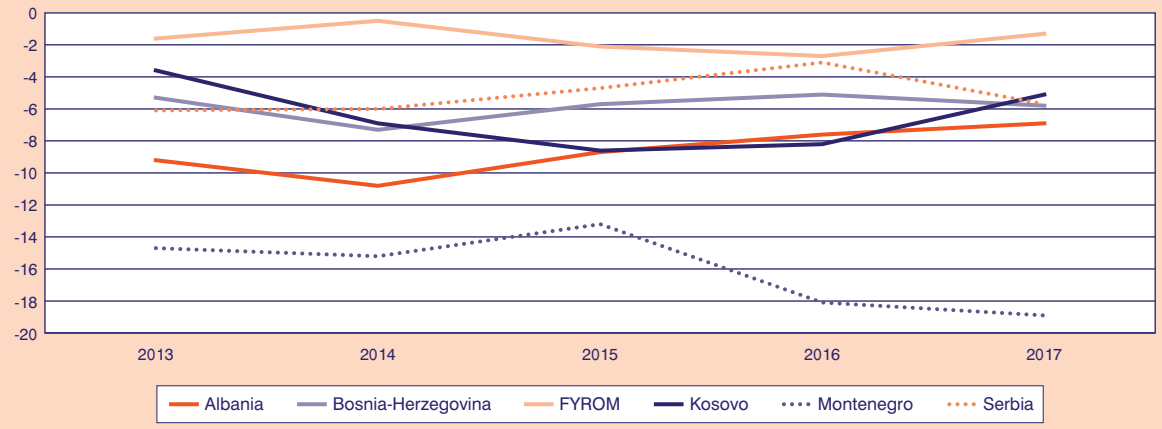
Banks in the region are liquid and well-capitalized. At the end of 2017, bank capital adequacy averaged 17.5 percent and the ratio of liquid to total assets was about 29.6 percent. Profitability, though low, has held firm, with a regional average return on assets of 1.7 percent. However, the sector is still dealing with the aftershocks of the financial crisis: despite improvements in the banking system as a whole, the vulnerabilities of domestic banks have renewed concerns about asset quality and the health of specific banks, especially in Bosnia-Herzegovina, Serbia and Montenegro. Further structural changes are likely after the planned sale of some foreign-owned subsidiaries as parent banks realign country exposures and smaller domestic institutions merge in Albania, Bosnia-Herzegovina and Serbia.

1.5.5. Current accounts

In 2017 external deficits widened in Bosnia-Herzegovina, Montenegro and Serbia, and narrowed in Albania, Kosovo and FYROM (Figure 1.5.5). The current account deficit in Serbia rose markedly –from 3.1 percent of GDP in 2016 to 5.7 percent in 2017– as supluses in trade in services failed to compensate for the 27.8 percent rise in the widening goods trade deficit and a 27.1 percent deficit in primary income. However, remittances grew robustly –by 10.1 percent, reaching 5.9 percent of GDP– and a net increase of 27.1 percent in FDI was enough to finance the current account deficit. Montenegro's high external imbalances worsened in 2017: the current account deficit widened to 18.9 percent of GDP in 2017, up from 18.1 percent the previous year. Imports of goods increased by 11.7 percent, led by the high import-dependence of investments in infrastructure and tourism. As EU demand rose, exports –led by metals and mineral ore sales– grew by 13.9 percent, and exports of services also rose by 8 percent. However this was not sufficient to offset the more than 2 pp widening of the trade deficit. Net FDI inflows increased to 11.2 percent of GDP, financing two thirds of the current account deficit. Bosnia-Herzegovina's current account deficit increased slightly in 2017, to 5.8 percent, driven mainly by increased imports needed for public investment projects. The services surplus from transport, travel, construction, and remittances was enough to finance a significant part of the trade deficit, while the rest was financed through FDI.

In contrast, a lower trade deficit and higher remittances contributed to the narrowing of current account deficits in Albania, Kosovo and FYROM. Specifically,

FIGURE 1.5.5
Western Balkans, Current account balance (% change)



Source: IMF, *World Economic Outlook,* April 2018.

Albania's current account deficit fell from 7.6 percent of GDP in 2016 to 6.9 percent in 2017, driven by an increase in exports of commodities, tourism and manufacturing-related services that pushed up total exports by 44.9 percent. Increased demand in the EU, Kosovo's main trading partner, led to a surge in exports of goods and services –by 23.1 percent and 17.7 percent, respectively– and contributed to the decrease in the current account deficit from 8.2 percent of GDP in 2016 to 5.1 percent. Higher remittance inflows also helped offset the rise in investment –and consumption– related imports. Finally, FYROM's current account deficit narrowed to 1.3 percent of GDP in 2017, down from 2.7 percent in 2016, driven by a solid export performance in iron and steel, furniture and tobaco.

Steady FDI inflows helped finance current account deficits: total FDI inflows to the region were relatively steady in 2017, supported by remittance inflows. In Montenegro, net FDI inflows went up 1.8 pp, to 11.2 percent of GDP as tourism and real estate investments resumed, but only financed 60 percent of the current account deficit. In Albania, net FDI inflows were associated with large investment projects, and in Kosovo diaspora investments in real estate were supported by the highest remittances in the region, 11.2 percent of GDP. In Serbia and FYROM, FDI inflows continued to fully finance the current accout deficit, but in Bosnia-Herzegovina, where FDI is significantly less than in other countries, they finance only about 30 percent of it. Although the Western Balkans have enjoyed substantial support to growth from FDI inflows, investment remains lower than recommended for sustainable growth.

1.5.6. Outlook and risks

In the medium term, real GDP growth in the western Balkans is projected to recover, reaching 3.2 percent in 2018 and 3.4 percent in 2019. (Table 1.5.1). FYROM's economy is projected to gain momentum in 2018 and grow at 2.3 percent, from zero in 2017, as investment and consumption recover after the resolution of the political crisis. In Serbia, a recovery in investment is projected to support growth of 3 percent in 2018 and 3.5 percent in 2019. Kosovo is projected to grow at 4.8 percent in 2018-19, led by higher capital spending and investment, while growth in Bosnia-Her-

TABLE 1.5.1 GDP growth (% change)

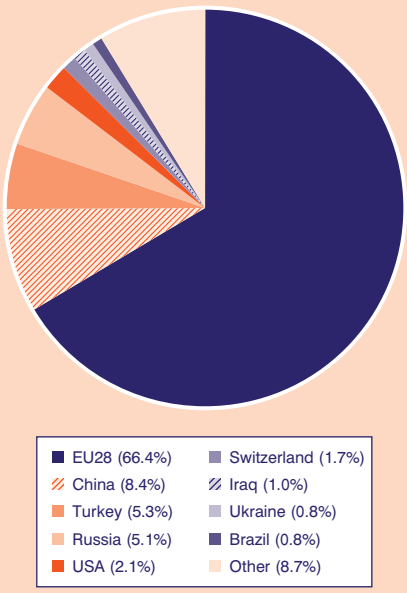
	2016	2017	2018*	2019*
Albania	3.4	3.8	3.6	3.5
Bosnia-Herzegovina	3.1	3.0	3.2	3.4
FYROM	2.9	0.0	2.3	2.7
Kosovo	4.1	4.4	4.8	4.8
Montenegro	2.9	4.3	2.8	2.5
Serbia	2.8	1.9	3.0	3.5
WB6	**3.1**	**2.4**	**3.2**	**3.5**

Source: IMF, *World Economic Outlook*, April 2018.

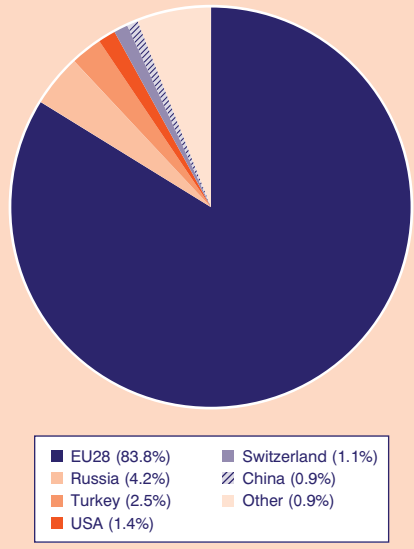
* Forecast.

FIGURE 1.5.6

Top trading partners
Imports 2017



Top trading partners
Exports 2017



Source: European Commission, Directorate-General for Trade, April 2018.

zegovina is also expected to pick up, supported by more investment in energy, construction and tourism. On the other hand, growth in Albania and Montenegro is expected to be moderate in 2018-19, as large FDI projects wind down and the necessary fiscal consolidation moves forward in Montenegro.

The projections for growth in the Western Balkans are closely linked to favourable external conditions: higher growth in global trade flows, favourable financing conditions and continued growth in the EU –the most important trade and investment partner of the Western Balkan countries (Figure 1.5.6). Implementation of structural reforms are also necessary for sustainable growth: these include reforming the complex tax administration, accelerating the privatisation agenda, improving the opaque business environment, dealing with clientelism and corruption.

Finally, a prerequisite for sustainable economic growth is political stability and ethnic reconciliation, an ever-elusive goal in the region. In this context, the Western Balkan regimes have to address the low quality of institutions and the electoral process, the protection of human rights and the freedom of the press. They must also push back against the recent increase in instances of ethnic tensions and populist/nationalist rhetoric. The European Union has a very important role to play in the economic, political and ethnic stability of the region: the EU's "Credible enlargement perspective for the Western Balkans" –launched in February 2018– aims at injecting fresh momentum into EU enlargement, speeding up the homework the six countries need to do and giving a concrete framework and timeline for achieving this.

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2. Public finance

KEPE, *Greek Economic Outlook,* issue 36, 2018, pp. 26-27

2.1. State Budget execution, first quarter 2018

Elisavet I. Nitsi

According to the most recent data retrieved from the General Accounting Office,[1] on a modified base, the execution of the State Budget in the first quarter 2018 shows an improvement compared to the corresponding period of 2017, as well as from the monthly targets set. These were reflected in the executive summary of the State Budget for the fiscal year 2018, as higher revenues were expected, as well as higher public expenditures.

According to the data shown in Table 2.1.1, the State Budget had a surplus in the balance amounting to 193 million euros in the period January-April 2018, against a deficit of 1.14 billion euros in the corresponding period of 2017, and a target for deficit of 1.76 billion euros. The State Budget Primary Balance had a surplus of 2.33 billion euros in comparison to a primary surplus of 1.73 billion euros for the same period in 2017 and a primary surplus target of 374 million euros.

More specifically, net revenues amounted to 15.52 billion euros, showing an increase of 215 million euros or 1.41% compared to the revenues of the first quarter of 2017 and 1.21 billion euros or 8.42% against the targets set by the 2018 Budget. The Ordinary Budget revenues amounted to 14.42 billion euros and are reduced by 135 million euros or 0.93% in comparison to last year's corresponding period, while they are higher by 689 million euros or 5.02% compared to the targets. Public Investment Program (PIP) revenues reached 1.09 billion euros, showing an increase compared both to the corresponding period of 2017 (350 million euros or 47.17%) and the budget target (516 million euros or 89.58%). It should be noted here that EU inflows increased compared to the budget target by 496 million euros or 99.20%, which means that less than budgeted revenue will flow in the remainder of the year.

On the opposite side, the State Budget expenditures decreased by 1.12 million euros or 6.81% compared to the corresponding period of 2017, showing a smaller reduction against the target set by the 2018 State Budget. This reduction can be attributed both to the restriction of the Ordinary Budget expenditures (6.84% compared to the corresponding period in 2017 and 1.29% against the Budget's target) as well as the interest payments (25.35% compared to the corresponding period of the previous year) and the PIB (5.79% and 52.45%, respectively), as the Government expenditures did not reach half of what was budgeted. In particular, the Ordinary Budget expenditures amounted to 14.82 billion euros, showing a decrease of 1.09 billion euros over the expenditures of the corresponding quarter of 2017 and 194 million euros against the target, while the primary expenditures that amounted 12.68 billion euros show a reduction of 361 million or 2.77% and 198 million euros or 1.54%, respectively. Finally, the Public Investment Budget shows a deficit of 556 million euros against a deficit target of 1.06 billion euros.

In sum, the execution of the State Budget in the first quarter of 2018 was clearly better than expected, due to increased revenues. Though part of these revenues, i.e. EU inflows in PIP and revenue refunds, have already been budgeted for the year. Moreover, the increased surplus also contributed to the reduced expenditures, and in particular the under-execution of the PIP, which is not enhancing the country's development effort.

On the other hand, in the ongoing assessment, which is expected to be the most difficult of all, an effort to close all the remaining prior actions of the third program will be made, but also decisions should be made on the final amount that Greece will be disbursing from the overall package of the third memorandum, as well as on the characteristics of the following day on debt and primary surpluses, as well as on the supervision framework with or without the IMF, to ensure that

1. Based on preliminary data published in the State Budget Execution Monthly Bulletin: General Accounting Office, May 2018.

TABLE 2.1.1 State Budget execution first quarter 2018, million euros

	Jan.-Apr. 2017	Jan.-Apr. 2018		2017	2018
	Outcome	Outcome	Targets[1]	Outcome[2]	Budget[3]
State Budget					
Net Revenue	15,300	15,515	14,310	51,422	54,244
Expenditures	16,442	15,322	16,073	55,690	55,188
Ordinary Budget					
Net Revenue	14,558	14,423	13,734	48,973	50,509
Expenditures	15,907	14,819	15,013	49,740	48,438
- Primary expenditure	13,039	12,678	12,876	43,532	43,238
- Interest payments (on a cash basis)	2,868	2,141	2,137	6,208	5,200
Public Investment Program (PIP)					
Revenue	742	1,092	576	2,444	3,735
Expenditures	535	504	1,060	5,950	6,750
State Budget Primary Balance[4]	1,724	2,334	374	1,940	4,257
State Budget Balance	-1,142	193	-1,763	-4,268	-943

Source: General Accounting Office, Greek Ministry of Finance.

Notes:

1. Targets as they were reflected in the Executive Summary of the State Budget for the fiscal year 2018.
2. The total revenue and expenditure outcome is preliminary and will be finalized after the vote of the 2017 annual Budget report (for both revenue and expenditure).
3. Annual estimates as depicted in the Executive Summary of 2018 Budget.
4. + surplus, - deficit.

Greece can cover its financing needs from the markets after the end of the program.

It is worth noting that the key decisions concern the budget, i.e. whether the agreed primary surpluses will be achieved and whether additional measures will be needed from 2019, such as the reduction of the tax-free threshold. Other important issues for which decisions should be taken are: real estate property values, the non-performing or so called "red" loans and the abolition of the protection of the first home (Katseli's law). In addition, there should be agreement on the activation of the "compensatory" measures that the government wants to institutionalize so as to enhance social protection, such as rent subsidies, creation of new child care centers, further expansion of the school meal program and the creation of active employment programs through the OAED, but also to invest in energy infrastructure and the primary sector.

In addition, there should be an agreement upon the package of medium-term debt relief measures, which will probably be linked to Greece's specific commitments to achieve the agreed budgetary targets, but also to the completion of the agreed reforms, if new measures are not required.

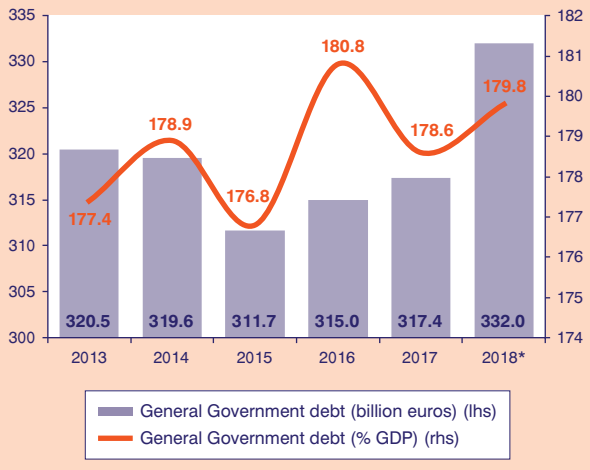
Finally, in addition to the assessment and agreement with the creditors, it is important to implement a development plan for the country, which although it has been presented to the institutions, it is not known in the country, except in its guidelines. If this project can change the country's productive model, attract new investment (both foreign and domestic), take advantage of the country's comparative advantages, boost economic efficiency and undertake major reforms (not only for public administration, tax, and insurance and banking systems, but also for the privatization program and the competitiveness of the markets), then there will be a revival of the economy, an increase in GDP and, consequently, the achievement of the fiscal targets in particular, the agreed surpluses and, therefore, returning the economy to regularity without additional fiscal measures.

2.2. The evolution and structure of public debt

Christos Triantopoulos

The level of public debt in 2017 was determined –among other factors– by the General Government balance, which, exceeding relevant estimates also showed a surplus over the past year. In particular, according to the initial estimates, of the Hellenic Statistical Authority (ELSTAT), the General Government surplus in 2017 stood at € 1.4 billion or 0.8% of GDP and the primary General Government surplus increased to € 7.1 billion or 4.0% (according to the Eurostat methodology and not that of the fiscal adjustment program). This better-than-expected fiscal performance –a result of the overperformance of fiscal policy measures– also affected the level of General Government debt, which stood at the end of 2017 at 317.4 billion (or 178.6% of GDP), whereas the estimate of the State Budget of 2018 –in November 2017– stood at € 318.3 billion (178.2% of GDP). Compared to the previous year, the General Government debt increased by € 2.4 billion in 2017, as a result of fiscal performance, the increase in cash flow through the European Stability Mechanism (ESM), and the funding –also provided by the support mechanism– of the arrears program (Figure 2.2.1). During the current year, according to the State Budget 2018 estimates, the General Government debt is projected to increase to € 332 billion (or 179.8% of GDP) as a result of: (a) the even larger funding by the ESM that is expected to increase cash flow (b) the funding –by the support mechanism– of the arrears clearance program, and (c) the substitution of the part of the debt that is based on short-term loans. Regarding, in particular, the latter factor, it is worth noting that a significant part of short-term loans corresponds to intergovernmental debt (see repos); thus, its substitution will result in an increase in the General Government debt.

FIGURE 2.2.1
General Government debt performance and estimates



Source: Hellenic Statistical Authority (ELSTAT) (for years 2013-2017) and State Budget 2018 (for 2018).

Note: * Estimate.

The Central Government debt emerges when intergovernmental debt is not taken into account (e.g. short-term borrowing through repos agreements with General Government entities). According to the data of the General Government Monthly Bulletin, the Central Government debt in February 2018 stood at € 337.1 billion, increased by € 8.4 billion compared to the end of 2018 (Table 2.2.1). This increase is due to the issuance of a new 7-year Greek Government bond of € 3 billion as well as the increase in short-term loans by approximately € 6 billion. Thus, the share of Central Government debt held in bonds stood in February 2018 at 15.3% of the debt (€ 53.5 billion), while the share of debt which is based on the loans of the support mechanism remained stable at 69% of debt (Table 2.2.1). In addition, Central Government funding is maintained at the same levels as in the previous months through short-term securities and, in particular, Treasury bills, which remained stable at € 14.9 billion (Figure 2.2.2).

Additionally, as mentioned above, short-term loans through repos agreements with General Government entities increased significantly in the first two months of 2018, standing at € 20.8 billion in February 2018, compared to € 14.9 billion at the end of 2017, constituting 6% of the total Central Government debt. However, this is expected to be limited, since, according to the State Budget 2018, it is estimated that these loans will be reduced –in the context of replacing short-term with long-term debt– to the amount of € 9 billion at the end of the year (Figure 2.2.3).

Alongside the debt structure, a significant change was noted in the Central Government debt characteristics

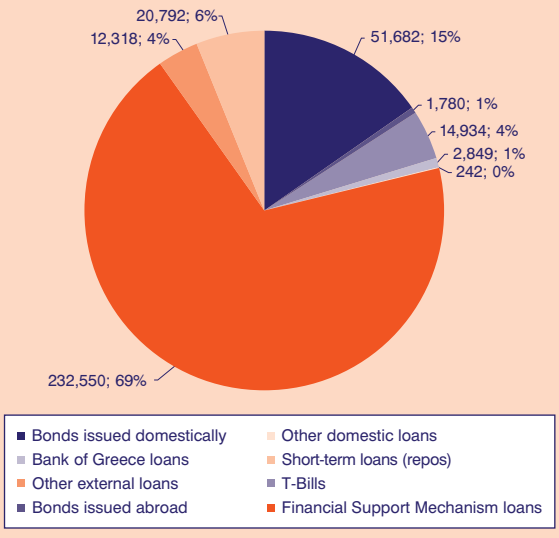
TABLE 2.2.1 Structure of Central Government debt

	2011		2013		2017		February 2018	
	Million euros	% debt	Million euros	% debt	Million euros	% debt	Million euros	% debt
A. Bonds	**259,774.18**	**70.6**	**76,296.25**	**23.7**	**50,457**	**15.4**	**53,462**	**15.9**
Bonds issued domestically	240,940.37	65.5	73,415.28	22.8	48,681	14.8	51,682	15.3
Bonds issued abroad*	18,833.81	5.1	2,880.97	0.9	1,776	0.5	1,780	0.5
B. T-Bills	**15,058.63**	**4.1**	**14,970.82**	**4.7**	**14,943**	**4.5**	**14,934**	**4.4**
C. Loans	**93,145.19**	**25.3**	**230,210.90**	**71.6**	**248,373**	**75.6**	**247,959**	**73.5**
Bank of Greece	5,683.99	1.5	4,734.61	1.5	2,849	0.9	2,849	0.8
Other domestic loans	836.71	0.2	115.50	0.0	247	0.1	242	0.1
Financial Support Mechanism loans	73,210.36	19.9	213,152.48	66.3	232,959	70.9	232,550	69.0
Other external loans **	13,414.13	3.6	12,208.31	3.8	12,318	3.7	12,318	3.7
D. Short-term loans * **	**0.00**	**0.0**	**0.00**	**0.0**	**14,931**	**4.5**	**20,792**	**6.2**
Total (A+B+C+D)	**367,978.00**	**100.0**	**321,477.97**	**100.0**	**328,704**	**100.0**	**337,148**	**100.0**

Source: Public Debt Bulletin (December 2011, December 2013) and General Government Bulletin (February 2018).

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

FIGURE 2.2.2
Central Government debt (February 2018), (million € ; % debt)

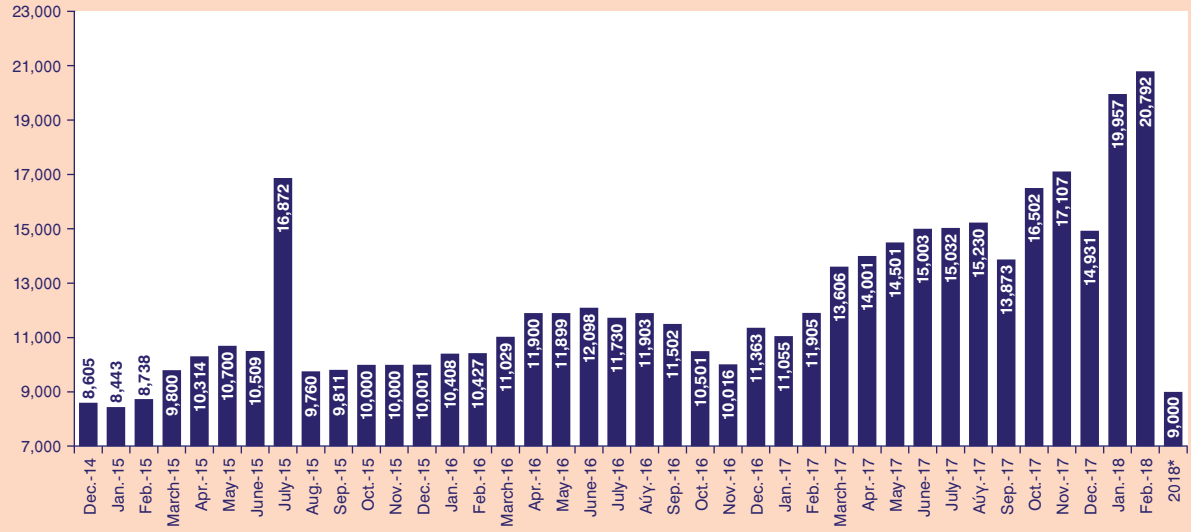


Source: Ministry of Finance, *General Government Bulletin* (February 2018).

and, in particular, in the stability or instability of the interest rate. Specifically, in December 2017, the fixed-rate debt ratio rose to 48.1% of debt versus 30.0% in December 2016, as a result of the increase in fixed-rate debt, which was 11.1% of the 2017 new loans. As for the other characteristics, there was no differentiation compared to the previous year; thus, the non-negotiable debt stood, in December 2017, at 80.1% of the total debt, while 97.4% of the debt was in euro(s) (Table 2.2.2 below).

Finally, with regard to public debt management, in 2018 –following the implementation of the first 2017 short-term measures to enhance sustainability– the focus is on shaping a strong "buffer" of liquidity, as part of an effort to increase non-program funding. This is an attempt based on both the fiscal outturn as well as the inflows of the planned ESM funding, which are expected to increase the cash flows of the State, which already stand at quite satisfactory levels.

FIGURE 2.2.3
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.

* Estimate.

TABLE 2.2.2 Composition of Central Government debt

	December 2011	December 2012	December 2013	December 2016	December 2017
A. Rate					
Fixed rate[1]	62.0%	32.7%	28.5%	30.0%	48.1%
Floating rate[1,2]	38.0%	67.3%	71.5%	70.0%	51.9%
B. Trade					
Tradable	74.7%	34.3%	28.4%	21.9%	19.9%
Non-tradable	25.3%	65.7%	71.6%	78.1%	80.1%
C. Currency					
Euro	97.5%	96.7%	95.9%	97.0%	97.4%
Non-Euro area currencies	2.5%	3.3%	4.1%	3.0%	2.6%

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

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

3. Human resources and social policies

KEPE, *Greek Economic Outlook,* issue 36, 2018, pp. 31-39

3.1. Recent developments in key labour market variables

Ioannis Cholezas

3.1.1. Introduction

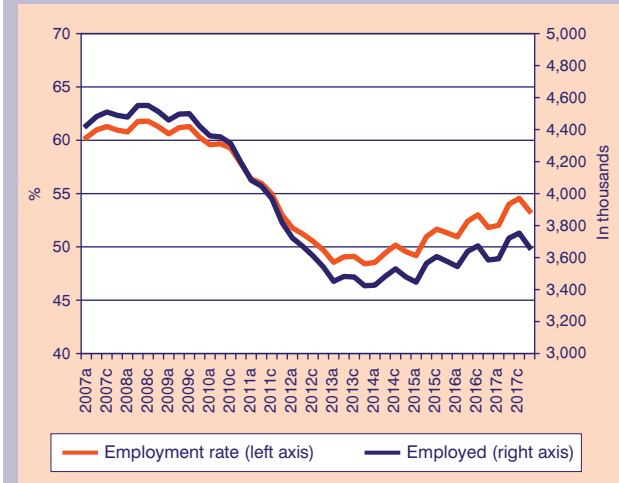
This issue focuses on employment and, particularly, the rebound that has been recorded since 2014, which continued in the last quarter of 2017, at least on an annual basis. The topics discussed include the characteristics of the new jobs created and, especially, their geographic distribution, occupations and industries involved, the ethnic origin of employed individuals, the level of education attained, gender and age. Finally, the last section discusses the temporary increase in the unemployment rate reported in the last quarter of 2017, which, nevertheless, does not seem to compromise positive employment prospects.

3.1.2. Employment

In the fourth quarter of 2017 the employment rate of individuals aged 15-64, which equals the ratio of the employed to the total population in the respective age band, was 53.4%. Thus, approximately eleven out of twenty individuals were employed or, in other words, there were 3.66 million employed individuals. This means that there were fewer employed compared to the third quarter of the year by 88.8 thousand individuals, probably due to the seasonal variation of employment. On the other hand, there were more employed compared to the same quarter in 2016 by approximately 79.1 thousand individuals. Therefore, on an annual basis the number of employed people continued to increase.

The employment rate typically was not this low (see Graph 3.1.1), although it always fell short of employment rates in other European countries. Note that the employment rate in Greece for individuals aged 15-64 has been fifteen percentage points lower than the EU average over the past few years, according to Eurostat. Note also that before the crisis erupted, the gap between Greece and the European average, with respect to the employment rate, was down to approximately five percentage points. In the fourth quarter in 2008 the employment rate was 61.3% and there were 4.51 million employed individuals in Greece, when the EU average was 65.6%. The economic downturn, coupled with austerity policies, pushed the employment rate lower very fast and expanded the differential with the other European countries. In the fourth quarter in 2013, almost 3.42 million individuals were employed and the employment rate reached 48.4%, which is the lowest rate over the past few years. Consequently, within five years some 1.1 million jobs were destroyed (2008-2013), while in the following four years –due to the weak growth rate– barely 240.2 thousand jobs were created (2013-2017), which is less than a quarter of the jobs lost. It becomes obvious then that the rate of job creation falls short of the rate of job destruction, which suggests that creating new jobs is neither an easy nor a simple task. In accordance with the arguments in the previous issue of *Greek Economic Outlook*, new jobs are very different than those they replace in many qualitative characteristics that have to do with working hours, job contract duration, etc.

GRAPH 3.1.1
Number of the employed and the employment rate



Source: Labour Force Survey, ELSTAT, KEPE processing.

The type of new jobs created since 2014 is important. Therefore, it is interesting to look into their characteristics. It is often argued, for instance, that the recovery of the economy should be based on the transformation of the production base. But if the new jobs are mostly created in traditional industries, e.g. agriculture and trade, then the growth process is not going as wished. Likewise, if the new jobs are occupied by graduates from the lower levels of education and/or immigrants and/or unskilled workers, then this is likely to be a sign that the value added of goods and services to be produced could be considerably enhanced, given that it is probably based on cheap labour. Moreover, if the new jobs are occupied primarily by males or mature individuals, then we are not making good enough use of the female and youth labour force. In other words, these two groups do not contribute to the growth of the economy as much as they should. Furthermore, if a big share of the increase in employment is fueled by the increase in self-employment, then the economy probably does not create as many paid employment jobs as it should or small firms are being established. The thing is that such firms will most likely find it difficult to survive once they enter the highly competitive international, or even European, business environment. Other parameters may also lead to differential results of which policy-makers should be aware.

Table 3.1.1 breaks down the increase in employment in period 2013d-2017d according to various individuals attributes. The first attributes are gender, age, education and citizenship. Note that a wider definition for youth is adopted, in order to include individuals aged 15-29. We strongly feel that integration problems facing youth entering the labour market for the first time are mostly due to the lack of work experience rather than age. Therefore, it is considered crucial to include tertiary education graduates in the group of youth.

The number of employed men increased during period 2013d-2017d by 135.8 thousand people. This equals a 6.6% increase and falls short of the respective increase in the number of employed women. As a result, the employment rate of men increased by four percentage points and that of women by three percentage points, leading to the widening of the gender differential. Therefore, the increase in employment is unbalanced and favours men. Likewise, the increase in the number of the employed aged 30-64 is almost twice as big compared to the increase in employed youth (7.5% vs. 4%). During period 2013d-2017d the

TABLE 3.1.1 Changes in the number of employed according to specific attributes

	2013d-2017d		Employment rate		
	Change (in thousands)	Change (%)	2013d	2017d	Change (per. points)
Total	256.4	7.4	37.4	40.8	3.4
Men	135.8	6.6	45.6	49.4	*3.8*
Women	120.6	8.4	29.7	32.7	3.0
Youth (15-29)	17.7	4.0	25.3	28.5	3.2
Mature (30-64)	222.5	7.5	56.0	61.1	*5.1*
PhD or Master Degree	53.2	39.0	71.8	78.1	*6.3*
University Degree	45.8	6.5	59.6	60.0	0.4
Higher Technical Vocational Education*	148.4	23.6	54.4	60.6	*6.2*
Lyceum	127.2	10.9	40.2	44.0	*3.8*
Gymnasium	-1.3	-0.4	30.0	30.2	0.2
Primary or less	-117.0	-22.9	18.5	16.8	-1.7
Greek citizenship	316.6	9.8	36.9	40.5	*3.6*
Foreign citizenship	-60.2	-23.8	46.3	47.4	1.1

Source: Labour Force Survey, ELSTAT, KEPE processing.

* Higher Technical Vocational Education includes graduates from post-secondary non-tertiary education (IEK) and TEI graduates.

Note: Italics represent changes bigger than the country average.

employment rate went up for both age groups, but more so for the 30-64 group; their employment rate increased by more than five percentage points. Bear in mind that the increase in youth employment is much weaker, despite active labour market policies targeted at youth. It is likely that without these targeted policies youth would be worse off. Nevertheless, assessing their effectiveness and results would be welcome.

People are becoming increasingly better educated in every country of the world that has a positive growth record. Technology is an important driving factor. The presence of a skilled labour force, i.e. human capital of good quality, is a crucial input in the process of technological development and at the same time a skilled labour force fuels this development. It is also well established that the level of education is one of the two key components of human capital. The other one is work experience. In this context, it is interesting to note that the number of employed individuals holding a PhD and/or a Master degree exhibited a 40% increase during period 2013d-2017d, which is the biggest increase amongst education groups and corresponds to 53 thousand new jobs, i.e. 20% of total new jobs. It would come as no surprise if it turned out that a large part of the increase is due to lowering wages of this group, which made them even more attractive for high skilled jobs. Another interesting fact is that the number of employed technical vocational education graduates exhibited the second biggest increase. Coupled with the significance attached to technical vocational education in the country, this observation becomes even more important. If we further add the weak increase in the number of employed university graduates, which falls short even of the increase in the number of employed lyceum graduates, there seems to be signs pointing to the conclusion that the labour market is transforming in ways that unexpectedly benefit certain education groups over others. Nevertheless, a clear view can only come from the detailed examination of the matching quality between graduates and jobs. Lastly, the employment rate increases with education, which shows that education does improve employment prospects, at least until now. Note that employment prospects got worse for graduates from the two bottom levels of education over the past four years, despite the overall increase in the number of the employed.

Another thing that is different compared to the recent past is the reduction in the number of employed foreign citizens during period 2013d-2017d who are mostly employed in low skilled or unskilled jobs, like some agricultural or construction related tasks.[1] The phenomenon is partly due to the linguistic difficulties facing foreigners in the Greek labour market and the low value attached to degrees awarded abroad. In any case, the reduction in the number of foreign citizens, while in the meantime the number of the employed increases (note that the number of employed natives increased by approximately 10%), may be attributed to the reduction of employment opportunities for the specific population group. The fact that there are fewer foreigners[2] nowadays does not diminish the importance of this observation, but rather reinforces it. The reader should recall that the main cause for migration in the past was finding a job,[3] which is probably why migrants typically have a higher employment rate than natives.

It is also interesting to look into the geographical distribution of the increase in the number of the employed. Table 3.1.2 consists of two parts. The first one presents the geographical distribution based on the degree of urbanity. In period 2013d-2017d the area around the capital city suffered from a 3.6% loss of jobs, which means that approximately 42 thousand jobs were lost. On the contrary, in the rest of the country new jobs were created. The biggest relative increase was recorded in Thessaloniki (22.4%), while the rest of the urban areas followed closely. Nevertheless, it should be noted that Thessaloniki exhibited the biggest decrease in the number of the employed in the previous period, i.e. 2008d-2013d.[4] The smallest increase in the number of employed individuals was recorded in rural areas, but compared to Thessaloniki, they also exhibited a smaller decrease in the previous period. Therefore, it seems that in both cases, changes in the number of the employed in period 2013d-2017d counterbalanced movements that took place before, when the number

1. It is estimated that in the mid-2000s the one out of four foreign citizens was employed in construction, while one out of ten of those working in agriculture was a foreign citizen. See Cholezas, I. and P. Tsakloglou (2009), "The economic impact of immigration in Greece: taking stock of the existing evidence", *Southeast European and Black Sea Studies*, 9(1-2), pp. 77-104.

2. The interested reader can verify the claim by looking at ELSTAT's labour force data. It turns out that the number of migrants in the labour force declined between 2013 and 2017 by over 25%.

3. See Cholezas, I. and P. Tsakloglou (2009). Ibid.

4. The respective data are not presented here due to space constraints, but they are available by ELSTAT.

of the employed decreased. These facts suggest that the reduction in the number of the employed in the capital is more serious than originally thought, since it is the only area in which the number of the employed falls consistently for almost a decade. As a result, in the last quarter of 2017 semi-urban areas are the ones with the biggest employment rate. Note also that the smallest employment rate is typically reported in Thessaloniki.

Turning to the second part of Table 3.1.2, it is clear that the increase in the number of the employed is not equally distributed across regions. The first observation is the reduction in the number of the employed in the Ionian Islands, despite the increase reported in the rest of the regions. The biggest increase is recorded in West Macedonia, followed by Continental Greece, the Peloponnese and East Macedonia & Thrace. There is a weak increase in the number of the employed in Attica, the North Aegean Islands and Epirus (4% or less). Note that during the downturn in employment, the number of the employed reduced the least in the North Aegean Islands and the most in Central Macedonia. Therefore, in the former, the number of the employed is less sensitive to economic conditions, while in the latter, it seems more sensitive. Attica, on the other hand, seems extremely sensitive to the worsening of economic circumstances in terms of employment, but it is less sensitive during the period of upturn.[5] The Ionian Islands are a special case

TABLE 3.1.2 Change in the number of employed individuals by degree of urbanity and region

	2013d-2017d		Employment rate		
	Change (in thousands)	Change (%)	2013d	2017d	Change (per. points)
Capital	-41.9	-3.6	39.2	41.7	2.5
Thessaloniki	57.3	22.4	33.1	38.8	*5.7*
Other urban areas	151.8	17.2	37.0	40.7	*3.7*
Semi urban	69.3	15.9	37.5	42.1	*4.6*
Rural	19.8	2.7	36.9	39.5	2.6
East Macedonia & Thrace	19.4	10.3	36.3	40.8	*4.5*
Central Macedonia	84.3	15.4	34.1	39.4	*5.3*
West Macedonia	5.6	7.1	32.7	36.0	3.3
Epirus	4.1	4.0	34.4	36.5	2.1
Thessaly	22.1	9.5	37.2	41.0	*3.8*
Ionian Islands	-5.9	-8.2	41.0	38.2	-2.8
West Greece	17.4	8.7	34.6	37.9	3.3
Continental Greece	20.7	12.3	35.3	39.9	*4.6*
Attica	41.7	3.2	39.1	41.5	2.4
Peloponnese	19.9	10.6	39.6	44.3	*4.7*
North Aegean	2.5	3.8	38.2	41.3	3.1
South Aegean	6.0	5.1	42.0	44.8	2.8
Crete	18.7	8.9	40.8	43.9	3.1

Source: Labour Force Survey, ELSTAT, KEPE processing.

Note: Italics represent changes bigger than the country average.

5. At this point it should be noted that the capital city is different than Attica, since the latter is much wider. Therefore, the reduction in the number of the employed in the former is not at odds with the increase in the number of the employed in the latter, since the difference can be attributed to areas outside Athens, but within Attica. More specifically, Athens exhibits a reduction in the number of the employed over the past four years.

TABLE 3.1.3 Change in the number of the employed by type of employment

	2013d-2017d		Employment composition	
	Change (in thousands)	Change (%)	2013d	2017d
Entrepreneurs	59.0	26.3	6.5	7.6
Self-employed	-37.5	-4.2	25.5	22.7
Employees	256.3	11.6	63.3	65.8
Assistant in family business	-21.3	-12.9	4.7	3.8

Source: Labour Force Survey, ELSTAT, KEPE processing.

on their own which should be more thoroughly investigated, in order to explain the continuous reduction in the number of the employed. Interestingly, the biggest employment rate was reported in the South Aegean Islands, the Peloponnese and Crete.

Another interesting fact is the type of employment of new employed individuals. Table 3.1.3 suggests that two types of employment increased and another two decreased during the past four years. More specifically, the number of entrepreneurs, i.e. self-employed with personnel, exhibited the biggest increase in period 2013d-2017d, followed by employees. On the contrary, the number of assistants in family businesses decreased the most, followed by the self-employed. The shares of each group increased or decreased accordingly. Moreover, it seems that the Greek economy converges to European standards which are characterised by a bigger share of employees and smaller shares of the remaining groups.[6] Note that the share of employees in the EU28 was 85.6% in 2017d, while the share of self-employed individuals did not exceed 10%; the share of assistants in family businesses barely reached 1% over the past years, while entrepreneurs typically accounted for 4% of all the employed. Nevertheless, it should be made clear that employees are the group that is farthest away from its pre-crisis level.

In previous issues of the *Greek Economic Outlook*, it was made clear that the consequences of the crisis did not spread equally across industries. The recovery that started back in 2014 has similar characteristics in the sense that some industries perform significantly better than others. In the past four years, most new jobs were created in the industry *Accommodation and food service activities* (more than 74 thousand jobs). *Wholesale and retail trade, etc.* and *Manufacturing* followed closely. Nevertheless, these industries are the biggest in the Greek economy (in terms of number of employed) and, thus, their sizeable contribution is, to some extent, expected. Taking size into account, it turns out that the number of employed individuals increased relatively more in *Mining and quarrying* and *Real estate property management*. The only issue is that these industries employ few individuals and, thus, the sample data may not be accurate. There is not a similar issue, though, for the industries of *Administrative and support activities* and *Hotels and restaurants service activities,* which exhibit a 30% increase in the number of the employed.

So far, tourism seems to be responsible for increasing employment over the period examined, both in relative and absolute terms. On the other hand, given that the demand for tourism services comes primarily from abroad, there are factors that can be only partially influenced by a single country's policies. Contrary to tourism, other industries shrank and continue to do so. For example, the number of employed individuals in *Agriculture, forestry and fishing* decreased by 26 thousand (5.4%), while in *Construction* the decrease in the number of the employed that started in 2008 still continues. At this point is seems noteworthy to refer to the industry of *Household activities as employers*,

6. Recall that in 2017 the self-employed with one or two employers were reclassified in the social security system as employees by Law 4387/2016. That may have driven the share of the employees upward. Nevertheless, the reform seems to have adapted to the labour market's practices, since this group of employed individuals were called quasi employees, i.e. they were not actually self-employed, and it was argued that Greece exhibited a big share of self-employed due to this group of employed individuals. This could be true as long as interviewees reported the change in their status, since LFS relies on their answers.

TABLE 3.1.4 Change in the number of the employed by industry

	2013d-2017d		Employment composition	
	Change (in thousands)	Change (%)	2013d	2017d
Agriculture, forestry and fishing	-25.8	-5.4	13.8	12.1
Mining and quarrying	3.0	34.1	0.3	0.3
Manufacturing	42.5	13.3	9.2	9.7
Electricity, gas, steam and air conditioning supply	1.7	5.8	0.8	0.8
Water supply; sewerage, waste management and remediation activities	5.0	21.0	0.7	0.8
Construction	-9.3	-6.1	4.4	3.9
Wholesale and retail trade; repair of motor vehicles and motorcycles	67.7	11.0	17.7	18.3
Transportation and storage	15.6	8.9	5.0	5.1
Accommodation and food service activities	74.2	29.5	7.2	8.7
Information and communication	14.0	18.4	2.2	2.4
Financial and insurance activities	-15.9	-15.1	3.0	2.4
Real estate activities	1.0	31.3	0.1	0.1
Professional, scientific and technical activities	12.9	6.6	5.6	5.6
Administrative and support service activities	20.5	31.2	1.9	2.3
Public administration and defence; compulsory social security	-1.1	-0.3	9.4	8.8
Education	12.2	4.3	8.1	7.9
Human health and social work activities	32.2	15.4	6.0	6.5
Arts, entertainment and recreation	4.2	9.2	1.3	1.3
Other service activities	18.1	28.2	1.8	2.2
Activities of households as employers; undifferentiated goods- and services-producing activities of households for own use	-16.1	-33.1	1.4	0.9
Activities of extraterritorial organizations and bodies	0.2	12.5	0.0	0.0

Source: Labour Force Survey, ELSTAT, KEPE processing.

since, despite the small number of the employed, it typically employs more foreign citizens. The decrease in the number of the employed reported is in accordance with the reduction in foreign citizens discussed in Table 3.1.1.

To sum up, employment expanded in some industries and shrank in others, causing changes in employment shares. Nevertheless, in either case, state policies should be suitable. In the first case, they should support those losing their job and accommodate their transition to a new job[7]. In the second case, they should refrain from actions that could jeopardise the favourable course so far, but at the same time make sure that employers fully comply with the tax regime and labour laws.

Table 3.1.5 presents the occupations which exhibited an increase in the number of the employed. *Managers* suffered the biggest decrease, which exceeded 40%.

7. Note that those who leave work are not automatically classified as unemployed, since they may retire, look for a job abroad or even drop out of the labour force (especially when alternate sources of income are available).

TABLE 3.1.5 Change in the number of the employed by occupation

	2013d-2017d		Employment composition	
	Change (in thousands)	Change (%)	2013d	2017d
Managers	-73.5	-42.4	5.0	2.7
Professionals	50.6	7.4	19.7	19.7
Technicians and associate professionals	19.3	7.1	7.8	7.8
Clerical support worker	60.9	17.9	9.8	10.7
Services and sales workers	163.1	23.1	20.3	23.2
Skilled agricultural, forestry and fishery workers	-30.5	-6.8	12.9	11.2
Craft and related trades workers	2.5	0.7	9.7	9.1
Plant and machine operators and assemblers	36.4	16.6	6.3	6.9
Elementary occupations	27.9	12.1	6.6	6.9
Other	-0.3	-0.5	1.9	1.8

Source: Labour Force Survey, ELSTAT, KEPE processing.

Given that the overall number of employed individuals increased, the reduction in the number of those at the top of the administrative hierarchy, although it seems relevant to cutting cost, it entails risks for the future, as long as it cannot be attributed to firms closing down, but to a firm choice. The second biggest reduction involves those working as *Skilled agricultural, forestry and fishery workers*, which seems to be in accordance with the reduction reported earlier in *Agriculture, forestry and fishing*, although much smaller in size. The number of the employed increased in the remaining occupational groups over the past four years. The biggest increase is reported for those employed in *Services and sales workers*, *Clerical support worker* and *Plant and machine operators and assemblers*. The first two groups seem to be at odds with the increase in the number of graduates from technical vocational education discussed earlier. But, there is reason to discard the possibility that these hires involve sizable mismatching, i.e. they are hired to do jobs that require a different set of skills. A safer conclusion can be reached only if richer data are analysed.

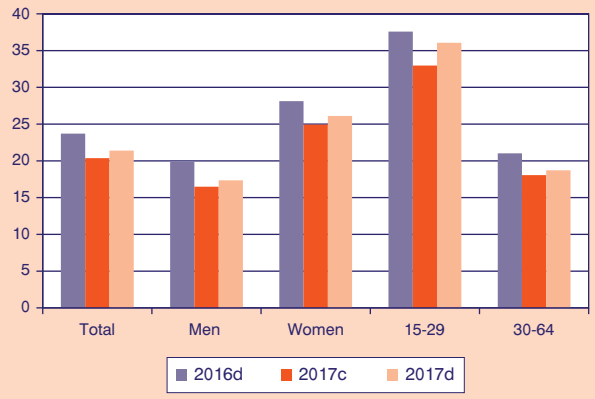
Moreover, it seems that the strongest increases in the number of the employed are reported in industries that could be termed "labour intensive". Although that means more jobs, at the same time it could prove problematic in the future, since it does not seem to align with increasing the economy's competitiveness through innovation and technological development, both of which can create sustainable jobs. Therefore, it would be desirable to increase the pace of creating new jobs in the capital intensive industries through shaping a suitable economic and business environment, in order to attract domestic and foreign investment. To that end, collaboration between the government and the social partners would be necessary.

3.1.3. Unemployment

The decrease in the number of the employed reported in the last quarter of the year due to seasonal variation was accompanied by an increase in the unemployment rate to 21.4% for individuals aged 15-64. Compared to the same quarter in 2016, the number of the unemployed decreased by 116 thousand and reached 997.8 thousand. In particular, on an annual basis, unemployed men decreased by 67.3 thousand and unemployed women decreased by 49.8 thousand. Moreover, unemployed youth aged 15-29 decreased by 25.3 thousand, while the unemployed aged 30-64 decreased by 90.7 thousand over the past year. Thus, the reduction in the number of the unemployed is mostly due to the reduction of unemployed men (share: 57%) and individuals aged 30-64 (77%).[8]

8. Note that a person can be a member of both groups.

GRAPH 3.1.2
Unemployment rate for selected population groups

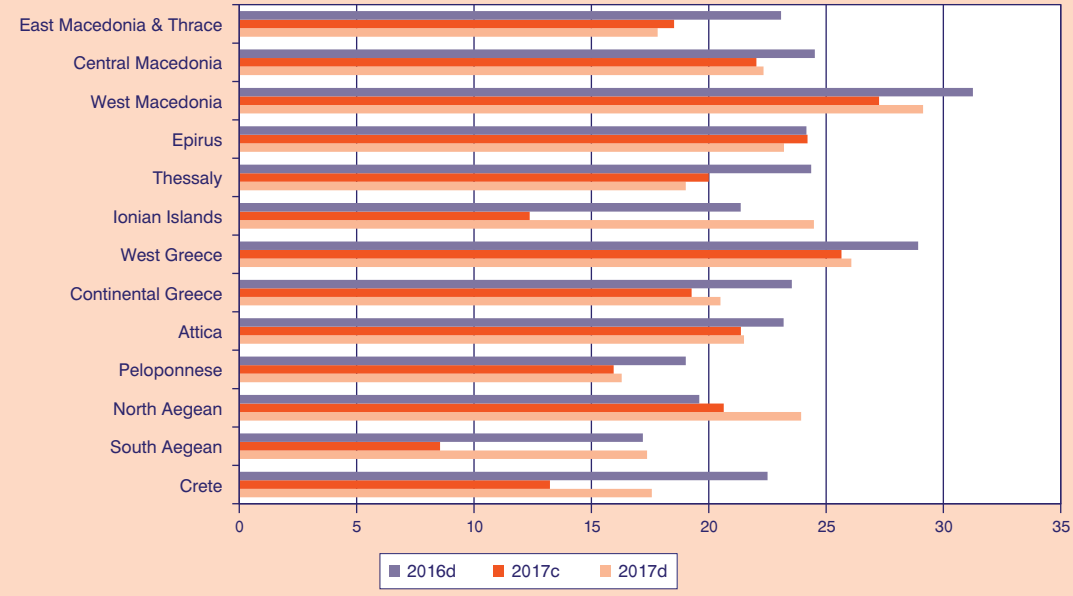


Source: Labour Force Survey, ELSTAT, KEPE processing.

On a quarterly basis, the number of the unemployed increased by 37.4 thousand, when last year the increase had been marginally over 31 thousand. This means that unemployment increased more this year due to seasonality. Indeed, a thorough look at the data reveals that this year's bigger increase is due to the bigger increase in the number of unemployed females (than men) compared to last year, i.e. the number of unemployed women increased by 3.5% this year compared to 1.8% last year. To sum up, despite the bigger seasonal increase in the unemployment rate in the last quarter of 2017, it seems that on an annual basis the downward trend of the unemployment rate still holds, which is encouraging for the labour market prospects.

Unemployment did not change uniformly across the country. Graph 3.1.3 shows that the number of the unemployed decreased on an annual basis in almost all regions. The North Aegean Islands, the Ionian Islands and the South Aegean Islands are exceptions to the rule. Recall that the North Aegean Islands are facing unusual circumstances due to the increased inflow of refugees; thus, it would come as no surprise if part of the unemployment increase was fueled by the fall in tourism activity due to refugee inflows. In defense of the argument, note that in the last quarter of the year the unemployment rate for individuals over 15 years of age in the North Aegean increased by 3.3 percentage points, when in other tourism-dependent regions the increase was much bigger. This fact shows that the North Aegean exhibited a smaller sensitivity to seasonal variation than other similar regions. To further demonstrate this point, note that the unemployment rate increased by 8.8 percentage points in the South Aegean Islands and by 12.1 percentage points in the Ionian Islands. Moreover, on an annual basis, the unemployment rate in the South Aegean

GRAPH 3.1.3
Unemployment rate by administrative region



Source: Labour Force Survey, ELSTAT, KEPE processing.

Islands increased by 4.3 percentage points. The respective figure in the Ionian Islands is 3.1 percentage points. The evolution of the unemployment rate in the Ionian Islands is hard to explain, since there are no obvious excuses like in the case of the North Aegean. On the other hand, the unemployment rate decreased significantly in East Macedonia & Thrace and in Thessaly. The reduction equals 24.2% fewer unemployed individuals in the former (14.4 thousand) and 21.4% fewer unemployed individuals in the latter (16.3 thousand). In Attica, where half of the country's population resides, the de-escalation of the unemployment rate was weak in the past year; it fell by nearly 1.7 percentage points. Nevertheless, due to its size, this reduction is responsible for about 1/3 of the country-wide decrease in the number of the unemployed.

KEPE, *Greek Economic Outlook,* issue 36, 2018, pp. 40-46

3.2. The Special Eurobarometer on the integration of migrants and the case of Greece

Jennifer Cavounidis

3.2.1. Introduction

In April 2018, refugee and migration flows to Greece increased significantly, not only to the Aegean islands from the coast of Turkey, but also to the mainland of Greece across the land border with Turkey formed by the Evros River. This new development created great concern that the flows might once again take on the massive proportions of those observed in 2015, before they were radically reduced subsequent to the common declaration of the European Union (EU) and Turkey issued in March 2016.

The public authorities, the mass media and public opinion focused once again, as in the past when migrant and refugee flows increased steeply, on the short-term, and specifically, on measures to meet emergency needs, such as border controls and the preparation of reception centers. Unfortunately, the long-term perspective has been overlooked. Issues of utmost importance for the future of Greek society and economy have been neglected, such as the design, in collaboration with the EU, of effective policies for the management of refugee and migrant flows and for the successful integration in Greek society of the migrants and refugees who will remain, despite their initial aim to move on to other countries of Europe.

The results of the Special Eurobarometer "The Integration of Immigrants in the European Union" that were published in April 2018 provide indications of the long road Greece must travel to achieve the smooth integration of those who will remain. The Eurobarometer data allow the comparison of attitudes in Greece about migrant integration with views prevalent in other EU countries. They point to areas where targeted Greek policies could contribute to the formation of more positive stances towards the migrants and refugees who will need to be integrated, as well as to various integration measures which appear to enjoy widespread approval in Greece.

As has been repeatedly noted (e.g. Jacobsen and Fratzke 2016; Papademetriou, Benton and Banulescu-Bogdan 2017), the effectiveness of policies for migrant integration depends not only on the economic conditions and opportunities in reception countries, but also on the perceptions prevailing amongst their populations. The design of suitable integration policies should take these perceptions into account as well as the wider economic and social landscape of the country where integration is being attempted.

3.2.2. Goals and topics of the Special Eurobarometer

The continuous migrant flows to the EU over the last decades and the near certainty that these will remain a reality in the 21st century, thereby rendering the development of effective migrant integration policies a major priority, constituted the impetus for the European Commission and the General Directorate of Migration and Home Affairs to request the Special Eurobarometer on the integration of migrants. As noted in the report presenting the results of the Eurobarometer (European Commission 2018), migration and migrant integration have become sensitive political topics, especially subsequent to the massive refugee flows into Europe observed in recent years. In many surveys of public opinion carried out in various European countries, migration proved to be the topic mentioned by the greatest numbers of citizens as the most pressing issue facing the EU. The achievement of successful migrant integration poses major challenges, and it was therefore considered advisable to systematically examine the views of EU populations, in order to facilitate the design of appropriate strategies and policies through the collaboration of European institutions with the member-states and other bodies. The field study of the Special Eurobarometer was conducted in the autumn of 2017, and specifically, between October 21 and 30.

It should be noted that at the beginning of the interviews, the respondents were informed that the questions about migrants referred to individuals who were born outside the EU (third countries) and moved from their country of birth and are presently residing legally in an EU country. In order to ensure that all the respondents had the same understanding of the individuals meant by the term 'migrants', this definition was repeated several times during the interview. Additional clarification was given that the term does not include migrants who have become citizens of the EU, or the children of migrants who have acquired

citizenship of the EU country where they reside, or migrants who are residing in the country illegally. In order to provide yet further clarification, the respondents of each country were told the top source countries of migrants in their country, which means that in Greece, Albania was mentioned as the main source country of migrants.

Because the refugee crisis, the difficult conditions experienced by newly-arrived refugees and migrants, and the problems faced by local communities where they have concentrated, particularly in the Aegean islands, have predominated in Greek news over the last few years, it is very likely that when Greek respondents of the Eurobarometer were asked about migrants, not only the older, settled, legal migrants suggested by the given definition were considered, but also the newly-arrived refugees and migrants. The Eurobarometer results for Greece should be interpreted bearing this in mind.

The Eurobarometer focused on the following topics:

- perceptions towards migrants and knowledge of the extent and characteristics of migration to their specific country,
- personal experiences and relations with migrants and comfort in interaction with migrants,
- evaluation of the success of migrant integration and the factors affecting it, and
- views about the roles and responsibilities of various institutions in migrant integration.

In what follows, some of the main findings of the Eurobarometer will be briefly overviewed, while noting the convergence with or divergence of Greece from other countries of the EU. Where feasible, the possible repercussions of the Greek findings for the design of Greek policies for migrant integration will be discussed.

3.2.3. Knowledge of migration

In the 28 countries of the EU (EU28), most of the respondents, and specifically, 61%, stated that they are not well informed about migration and migrant integration. In Greece, the proportion reached 69%, indicating that there is a wide margin for public information campaigns.

In order to assess the knowledge of the respondents, questions were posed about the migrant population in their own countries. They were first asked whether they believed most of the migrants in their country are residing there legally or illegally. In Greece, the highest percentage of all EU28 countries was observed with respect to those believing that most migrants are in their country illegally, and specifically 58%, compared to the EU28 average of 29%. The other country exhibiting a much higher than average percentage was Italy (47%), a country which, like Greece, has been the recipient of large numbers of refugees and migrants since 2014. The recent massive inflows appear to have influenced the formation of responses given in Greece, "displacing" the experiences of respondents with the hundreds of thousands of migrants from Albania and other countries of Central and Eastern Europe who arrived in Greece from the early 1990s and acquired residence permits in the various programmes for legalisation of undocumented migrants.

It should be noted that for the EU28 as a whole, the view that most migrants are residing legally and not illegally is more typical of respondents of younger ages and with higher levels of education. It is worth noting how the view that most reside legally is associated with responses to other questions in the Eurobarometer. More particularly, those who perceive migration to be more of an opportunity than a problem are more likely to believe that most migrants are in their country legally than those who consider migration to be more of a problem. Similarly, those who believe themselves well-informed about migration are more likely to think that most migrants are in their country legally. Furthermore, those who feel more comfortable in social relations with migrants as friends, colleagues, neighbors, etc., are more likely to believe that most migrants in their country are residing there legally.

Next, respondents were asked to estimate the proportion of migrants in the population of their country, with the clarification that migrants are those born outside the EU. When the response "I cannot estimate their proportion" is excluded from the analysis, in almost all countries (25 of 28), the estimates surpassed the actual proportion, while in 19 countries the estimate was at least double their actual proportion. Greece was among these 19 countries, with the average estimate to be about 20% of the population, compared to the figure of 8.4% cited by the Eurobarometer report (European Commission 2018) to be their actual proportion in the Greek population at the time, based on Eurostat data. Nonetheless, the degree of overestimation observed in Greece (2.4) was not among the highest and was close to the average degree of overestimation (2.3) for the EU28. In some countries, all with small proportions of migrants in their populations, the overestimates were much greater – in Romania, Bulgaria and Poland, the

estimated proportion was at least eight times their actual proportion, while in Slovakia, it was fourteen times greater. For the EU28 as a whole, the estimated proportion of migrants was smaller when the respondent had more education and less difficulty in paying bills frequently or sometimes (the variable used in the study to assess the economic security of respondents).

3.2.4. Personal experiences with migrants and comfort in interaction with them

Questions were posed in the interviews as to the frequency of interaction with migrants in different contexts, with the clarification that interaction can be of any type, such as the exchange of a few words or participation in some activity together. It is noteworthy that of all 28 EU countries, the respondents of Greece presented the greatest frequency of interaction with migrants. For the EU28 as a whole, 37% replied that they had daily interaction with migrants, 23% that they had such interaction on a weekly basis, and 37% that their interaction was less frequent. In comparison, 57% in Greece said they had daily interaction, while the other countries with relatively high percentages were Ireland (55%), Austria and Sweden (each 52%), and Spain and Italy (each 51%), while the smallest percentages of daily interaction were observed in Bulgaria (1%) and Romania (3%), countries which have very small proportions of migrants in their populations.

With regard to interaction with migrants in the neighborhood (the respondents were given the examples of interaction in shops, restaurants, parks, and on the street), once again Greece presented the highest percentage, with 45% reporting that they have such interaction daily in their neighborhood, in comparison to 23% for EU28. On the contrary, with respect to interaction with migrants at the workplace, Greece recorded the same percentage (20%) as the EU28 average. Greece also placed close (18%) to the EU28 average (15%) with respect to the reporting of daily interaction with migrants while using public services such as hospitals or mass transportation. Daily interaction with migrants at childcare centers, schools or universities was at similar levels for respondents in Greece (14%) and the EU28 as a whole (12%).

The next topic in the interviews was how comfortable the respondents would feel with different types of social relations with migrants. Given that the level of daily interaction with migrants in Greece was the highest of any EU country, it is surprising that the percentages of respondents in Greece who said they would not feel comfortable interacting with migrants in various contexts were high compared to the EU28 averages and were close to those recorded in Bulgaria, Hungary, and the Czech Republic.

The specific social relations asked about were having a migrant as a friend, a colleague at work, a neighbor, a doctor, a member of the family (including as a partner), and as a manager. Three responses were possible: “totally comfortable”, “somewhat comfortable”, and “totally uncomfortable”.

For each relation, the proportion of respondents in Greece who replied that they would be totally uncomfortable with the specific relation is higher than the corresponding EU28 average. The relations for which Greece exhibits the greatest divergence from the EU average are for having a migrant as a manager and as a family member. For the relation of manager, 47% of respondents in Greece said they would feel totally uncomfortable, while the other countries with high levels of discomfort were Hungary, Bulgaria, and the Czech Republic. As far as the relationship of family member is concerned, in Greece 51% stated they would feel totally uncomfortable, while other countries with large proportions declaring the same were Hungary (59%) and Bulgaria (55%), followed by the Czech Republic (44%), Cyprus (42%), and Romania (40%). On the contrary, countries where large proportions declared that they would feel totally comfortable with a migrant as a family member are the Netherlands (78%) and Sweden (74%).

Analysis was performed of the responses about comfort levels with various social relations according to social and demographic factors. Lesser comfort with migrants was ascertained of those who are older (55+), have less education (finished their education at age 15 or earlier), and are of lesser economic means (have difficulty paying their bills often or sometimes). A strong association was observed between comfort in interaction with migrants and the view that migration is more of an opportunity than problem. It is noteworthy that precisely this combination was observed in Greece, with a small proportion declaring comfort in relations with migrants and a small proportion considering migration to be an opportunity.

In any case, it should be added that Greece was close to and slightly higher than the EU28 average with respect to actual friendship relations with migrants, with 29% and 27%, respectively, declaring that they have migrants as friends. On the contrary, the proportion of respondents in Greece who have migrants as family members was lower (1%) than the EU28 average (4%).

3.2.5. Views about the impact of migration on society and the economy

In the key question of the Eurobarometer about whether migration from countries outside the EU is more of a problem or opportunity for the respondent's country, in the EU as a whole 38% replied that it is more of a problem, 31% that it is equally a problem and an opportunity, and 20% that it is more of an opportunity. In Greece, as in Hungary and Malta, the highest percentage (63%) of the EU28 was observed with respect to respondents considering migration more of a problem than an opportunity. Correspondingly, in Greece the lowest percentage (3%) was observed for those considering migration more of an opportunity, while the highest percentages were observed in Sweden (45%), Ireland (36%), and the United Kingdom (35%).

It should be noted that for the EU as a whole, the tendency to consider migration a problem increases with the age of the respondent, decreases the greater the age at which the respondent completed his/her education, while it increases if the respondent has difficulty paying bills. Furthermore, respondents who believe most of the migrants in their country are there legally rather than illegally are more likely to consider migration an opportunity. As seen above, in Greece a large percentage (the highest of all EU countries) believe that most migrants are there illegally, and a very small percentage (the lowest of the EU) consider migration an opportunity.

It was also ascertained that countries with large proportions of migrants in their populations tend to have more positive views about the impact of migration. Relevant examples here are Sweden, the United Kingdom and Luxembourg, where the proportion of migrants exceeds 8%, and positive views about the impact of migration are observed, while in Bulgaria and Hungary, where the proportion of migrants is less than 2%, negative views about migration are recorded. Obviously, Greece must be considered an exception to this trend, given that it is among the countries with a large proportion of migrants (8.4% according to the Eurostat data presented in the Eurobarometer report (European Commission 2018)), but at the same time registers very negative views about the migration impact. Greece must also be considered an exception to another ascertained trend that frequent interaction with migrants is accompanied by more positive views about the impact of migration, given that, as seen above, Greece was the country with the highest percentage of respondents declaring that they have daily interaction with migrants. The negative attitudes observed in Greece as to the impact of migration are undoubtedly related to the inadequate management of the massive inflows observed in recent years, a phenomenon not observed in the aforementioned countries with large proportions of migrants in their midst and positive views about their presence.

Questions were also posed as to the impact of migrants on various dimensions of economy and society, and once again respondents in Greece and a few other countries stood out in terms of their negative views. With respect to the impact of migrants on society, 61% in Greece replied that their impact is negative, as did 64% in Bulgaria and 60% in Hungary, compared to 13% in Sweden and the average of 23% for the EU28. As in most all of the countries, the majority of respondents in Greece (62%) agreed that migrants help by taking on jobs for which it is difficult to find workers. As for the impact of migration on the economy more generally, respondents in Greece had the most negative views of all the EU28, with 67% disagreeing that migrants have a positive impact, followed by Hungary (66%) and Bulgaria (63%). Similarly, a relatively high proportion (67%) of respondents in Greece disagreed that migrants bring new ideas and contribute to innovation. As far as the cultural impact of migrants is concerned, in Greece the majority did not agree that migrants enrich cultural life, contrary to most countries.

In the interviews, respondents were also asked if they believe migrants constitute a burden on the welfare system of their country. Greece once again diverged from most countries, along with Malta, and registered the largest percentage (75%) of agreement that they are a burden, while the average for the EU28 was 56%. Nonetheless, where Greece diverged even further from the EU average in terms of its negative views was on the question as to whether migrants take jobs from others, with 73% replying affirmatively, while the next highest percentage was 65% and belonged to Cyprus, compared to the EU28 average of 39%. As far as criminality is concerned, 70% in Greece replied that migrants worsen the crime problem, compared to 55% for the EU28.

In the analysis of responses for the EU28 as a whole, it was ascertained that those who consider themselves well-informed about migration and migrant integration stated in larger percentages that migration is more of an opportunity than a problem. As noted above, the proportion of respondents in Greece who consider that they are not well-informed was higher than the average for the EU28, and specifically, 69%. Therefore it could probably be expected that respondents in

Greece would negatively evaluate the impact of migration, as indeed was the case.

3.2.6. Views about the success of migrant integration and relevant criteria

In the eyes of respondents in Greece, the integration of migrants is not successful. They were asked about the success of migrant integration: 1) generally, 2) in the city or area where they live, and 3) in their country more generally. On all three questions, the respondents in Greece said in smaller proportions than the EU28 average that integration is successful, while large percentages in Greece said that integration is unsuccessful (49%, 51% and 62%, respectively, to the three questions). Countries where larger percentages of respondents than in Greece (62%) declared that integration in their countries more generally is not successful were Sweden (73%), France (64%), Italy (63%), and Germany (63%).

In the data analysis, it was ascertained that respondents who were older (55+), of lesser education, and were economically insecure were more likely to believe that migrant integration in their country is unsuccessful. As might be expected, those who believe migration is more of a problem than an opportunity were also more likely to judge integration to be unsuccessful. It is noteworthy that those who consider themselves well-informed about migration matters were more likely to believe that migrant integration is successful.

With respect to the criteria for a migrant to be considered successfully integrated into the specific society, the criterion chosen by the largest percentage of respondents (68%) as very important was the ability to speak the language of the host country, while the respective percentage for Greece was 76%. At the EU28 level, it was also considered very important by a large percentage (62%) that the migrant contributes to the welfare system through the payment of taxes, while Greece exhibited the highest percentage of respondents considering this very important, and specifically, 88%. Garnering considerable percentages, but smaller than those for the previous prerequisites, were the criteria that the migrant accepts the values and social norms of the society (56% for the EU28 and 54% for Greece), that the migrant has suitable education and vocational skills to find a job (48% and 59%, respectively), and that the migrant has friends of the country's nationality (34% and 32%, respectively). The dimension along which Greece (47%), together with Spain (47%) and Ireland (48%), presented much higher percentages than the EU28 (34%) was to consider as very important that the migrant shares the cultural traditions of the host country. This dimension was also ascertained in other studies and surveys (reviewed in Cavounidis 2017) as differentiating Greece from other countries, with respondents in Greece placing great emphasis on the adoption of its cultural customs by migrants.

3.2.7. Views about obstacles to integration and measures to promote it

Finally, respondents were asked to evaluate potential obstacles to migrant integration as well as measures to facilitate it. In Greece, the factor that was considered by the highest percentage of respondents (77%) as a serious obstacle to integration is difficulty in finding work (compared to 63% for EU28), while the next important obstacle according to respondents in Greece is the limited effort made by migrants themselves, cited by 73% compared to 65% in the EU. Other serious obstacles reported by substantial percentages in Greece are the difficulties in accessing long-term residence permits (70%), discrimination against migrants (69%), and their restricted access to education, health care and social protection (68%).

It is interesting that the percentage of respondents in Greece who consider the promotion of migrant integration to be a necessary investment for the future of their country was one of the lowest of the EU28, and specifically 47%, compared to the EU28 average of 69%. The other countries with low percentages believing migrant integration to be a necessary investment were Bulgaria and Hungary (41%), as well as Slovakia (44%), while the highest percentages were found in Sweden (91%) and the Netherlands (89%), along with Portugal and Finland (85%), compared to the EU28 average of 69%. The data analysis showed that those who disagree that migrant integration is an important investment are more likely to be older (55+) and of lower education, and to have difficulty paying their bills. It was also found that the overwhelming majority (90%) of those who believe migration is more of an opportunity for their country rather than a problem agree that it is an important investment while those who believe it is more of a problem agree less (49%).

Turning to the specific measures that residents of Greece think contribute to migrant integration, the measures that gathered the largest percentages of the reply "I agree completely", all with at least 52%, were the provision of language courses to migrants when they arrive in the country, support for registration of migrant children in preschool education, and compulsory attendance of language and integration programs

upon arrival. It should be noted that when the replies "I agree completely" and "I tend to agree" are grouped together, the percentage that agrees with each of these three measures approaches or surpasses 90% of the valid answers. It should also be noted that the proportions in Greece who agree with each of the measures were higher than the respective EU28 averages; lower than average percentages were observed in most of the countries that Greece had been Eurobarometer "partners" with, in terms of their negative attitudes towards migration and specifically Hungary, Romania, and Italy. In other words, Greece parted company with these countries when it came to attitudes about integration measures.

Particularly noteworthy is the very large proportion (89%) of respondents in Greece who agree (completely or somewhat) that the better preparation of local communities, with the provision of information about migration and migrants, would advance integration. Yet other measures that were considered in Greece to promote migrant integration are the introduction or improvement of programmes for migrants upon their arrival (89%) and the provision of measures for finding work, such as vocational education and the recognition of qualifications, etc. (86%).

With respect to the question as to whether they consider successful migrant integration in their country to be a process of mutual adaptation where both the migrants and the specific society have joint responsibilities or whether it is a more a matter for the migrants themselves or for the specific society, the majority of respondents in Greece and specifically 60%, replied that it is a mutual process, compared to 69% for EU28. As far as the role of various institutions in achieving integration is concerned, the overwhelming majority of respondents in Greece, as in the EU28, believe that an important role (either "very important" or "somewhat important") should be played by many bodies, and specifically the national government (96%), local and regional authorities (96%), and educational bodies such as preschools, schools, and universities. To the question whether the government is doing enough to promote the social integration of migrants, 58% of respondents in Greece answered affirmatively and 37% negatively, compared to 51% and 39%, respectively, for the EU28.

3.2.8. Conclusions

Analysis of the data from the Special Eurobarometer for the integration of migrants identified two main axes which differentiate the responses given in various countries of the EU28. First, there was an important socio-demographic divide between those who are younger, better educated, and economically secure (based on their reply that they do not have difficulty paying their bills), and those who are older, with less education, and economically insecure, with the former group exhibiting more favorable attitudes towards migrants.

Second, there was striking regional differentiation in the EU28, with countries of Northern Europe together with Portugal diverging from countries of Central and Eastern Europe along with some Mediterranean countries that recently received massive inflows of migrants and refugees, and specifically, Greece and Italy. In the first group of countries, more positive attitudes towards migration and migrants were observed than in the second group.

Even though clarifications were given at various points in the interviews as to which population of migrants the questions referred to, that is, those residing legally in the country, such as, in the case of Greece, the hundreds of thousands of migrants from Albania and elsewhere who arrived from the early 1990s, it appears very likely that the negative attitudes towards migrants observed in Greece were shaped in relation to the unprecedented flows of refugees and migrants to Greece in recent years and the ineffective management of these flows.

Ineffective management of these flows not only has serious negative repercussions for the welfare of newly-arrived migrants and refugees and of the local communities where they stay, but as is apparent in the responses of Greece to the Eurobarometer, may also affect future prospects for successful integration in Greek society of those who remain. When flows are not effectively managed, citizens come to believe that migration is out of control and negative attitudes towards migrants are forged, undermining prospects for smooth integration in the long term. In short, with inadequate migration management, not only are the human rights of the newly-arrived jeopardized along with the social cohesion of local communities where they arrive, but also the prospects for successful integration.

Nonetheless, there are some areas in which Greek responses to the Eurobarometer create room for optimism. It is noteworthy that there was widespread recognition that various measures can contribute to migrant integration (presumably, recognition implies approval of the measures), including the registration of children in the educational system, a measure previously found to enjoy widespread acceptance in Greece (Cavounidis 2017).

The data for Greece also indicate that there is great scope for information campaigns which can contribute to more positive attitudes towards migrants, given that a very large percentage of the respondents stated that they were not well-informed about migration and migrant integration. Furthermore, a large percentage declared that better preparation of local communities, through the provision of relevant information, would assist migrant integration. With respect to the very negative views recorded as to the impact of migration on Greece, it could be emphasized in information campaigns that most of the large migrant population is residing in Greece legally and makes a substantial contribution to the Greek economy through their employment and their contributions to the Greek social security system, and also that most of the migrants who arrived in the past have been successfully integrated into Greek society. It could also prove effective, with respect to reversing negative views about the migration impact, to discuss migration in terms of the serious demographic problem facing Greece due to the ageing of its population, and its dire consequences for the social security system.

The Greek state should focus its attention not only on the short-term, but also on long-term measures for effective management of inflows and the successful social integration of those who will remain in Greece. Unfortunately, to date, Greek policies have focused almost exclusively on the short term, with the hasty preparation, at the last minute, of temporary measures to handle new inflows. Ineffective management of inflows and of reception facilities for new arrivals seriously damages future prospects for successful migrant and refugee integration.

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4. Development policies and sectors

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4.1. External trade of agro-food products

Athanasios Chymis

4.1.1. Introduction

Economic theory predicts and international experience shows that when there is economic growth, imports also grow. This is the result of an increase in household consumption and, possibly, public sector consumption. Greece had a relatively weak growth in 2017, 1.4%. However, total imports (including petroleum) rose by 14% to € 50.26 billion while total exports rose by 13.4% to € 28.83 billion. The total trade deficit grew by 14.9% to € 21.43 billion.

It is customary in the literature to take out petroleum when studying trade. This is particularly the case when dealing with non-petroleum-producing countries, like Greece. The reason is that petroleum imports and exports are a significant part of the total trade and they distort the picture of the trade of all other goods. Moreover, the significant fluctuations in the price of petroleum over the years also distort the picture of the total trade. Greece is a net importer of petroleum products. However, a large part of these gets processed in the Greek refineries and is then exported. In 2017, petroleum imports were € 12.21 billion whereas petroleum exports were € 8.97 billion. The difference –€ 3.24 billion– is the contribution of the petroleum trade deficit to the overall trade deficit. It is worth noting that in 2008, the year with the largest trade deficit for the Greek economy, the agro-food products trade deficit was € 3.01 billion.

4.1.2. Agro-food trade in comparison to total trade (excluding petroleum)

Table 4.1.1 shows the evolution of agro-food trade in comparison to total trade (now excluding petroleum products) for the period 2008-2017. The calculation

TABLE 4.1.1 Total trade and agro-food products trade (in billion €)*

	2008	2010	2012	2013	2014	2015	2016	2017	% annual change rate	% change 2016-2017
						Imports				
Total	48.60	36.49	30.21	29.64	31.66	31.24	34.34	38.05	5.0 ('13-'16)	10.8
Agro-food	7.05	6.30	6.34	6.54	6.49	6.31	6.62	7.00	**0.8** ('10-'16)	**5.7**
Agro (%)	*14.5*	*17.3*	*21.0*	*22.1*	*20.5*	*20.2*	*19.3*	*18.4*		
						Exports				
Total	15.46	14.46	16.73	16.67	16.84	17.90	18.53	19.86	5.2 ('09-'16)	7.2
Agro-food	4.01	4.41	5.24	5.42	5.18	5.72	6.14	6.10	**6.3** ('09-'16)	**-0.5**
Agro (%)	*25.9*	*30.5*	*31.3*	*32.5*	*30.7*	*31.9*	*33.1*	*30.7*		
						Deficit				
Total	33.14	22.04	13.48	12.98	14.82	13.34	15.81	18.18	6.8 ('13-'16)	15.0
Agro-food	3.04	1.89	1.09	1.12	1.31	0.60	0.49	0.90	**-20.3** ('10-16)	**84.6**

Source: Hellenic Statistical Authority (ELSTAT), own calculations.

* Excluding petroleum.

of the average annual rate of change is not based on the same year for each case. The reason is that 2008 was a year of relatively high values (and volumes) of trade. Then as the global financial crisis hit and as it evolved into a full-blown economic crisis in Greece, trade changed dramatically. Total imports, total exports, agro-food imports and agro-food exports took different times to adjust to the new economic conditions.

Specifically, after total imports hit an all-time high of € 48.60 billion in 2008, they shrank 39% by 2013, reaching € 29.64 billion. Since then total imports have been increasing, particularly during the last two years. During the period 2013-2016 the average annual rate of imports growth was 5.0%, while last year they accelerated up to a 10.8% rate of growth (Table 4.1.1).

Total exports adjusted to the crisis by declining 15.7% in 2009 (€ 13.03 billion), down from € 15.46 billion in 2008. They have been increasing since, albeit not as fast as the Greek economy would require for a faster growth. Between 2009 and 2016 total exports grew at an annual average rate of 5.2%, while last year they grew at 7.2%.

The total trade deficit mostly follows imports' changes because imports are far larger than exports. After an historical high of € 33.14 billion in 2008, the total trade deficit reached a low of € 12.98 billion in 2013, which is a cumulative decrease of 60.8%. Since 2013 the trade deficit has been on the rise at an average annual rate of 6.8%, while in 2017 the growth rate jumped to 15.0%.

Agro-food products, as this column has repeatedly written, are necessity goods, rather than luxury goods (such as vehicles and other industrial goods). This means that agro-food products have low elasticity and their imports cannot decrease as much as all other goods. Agro-food imports declined in 2009 and 2010, cumulatively by a mere 10.7%, down to € 6.30 billion from a high of € 7.05 billion in 2008. They have since been exhibiting a rising trend which has intensified during the last two years, thus reaching again € 7 billion in 2017 (Table 4.1.1).

Agro-food exports remained stable in 2009 (marginal decrease of 0.3%) and have been increasing since at an average annual rate of 6.3%, except in 2014 when agro-food exports declined by 4.4%. Last year, 2017, there was a marginal decrease by 0.5%. It should be noted that the cumulative growth of agro-food exports between 2009 (€ 4 billion) and 2016 (€ 6.14 billion) is 53.5%.

The result of these developments is that the agro-food trade deficit was cumulatively cut by 83.9% between 2008 and 2016. The average annual rate of decline during the period 2010-2016 was 20.3%. The deficit grew slightly in 2013-2014, while last year it almost doubled (84.6% increase). The years to come will show a) if the agro-food trade deficit has a ceiling (e.g. € 1 to € 1.5 billion) under which it can fall only temporarily (e.g. during good years of olive oil production, as was the case for 2015 and 2016) or, b) if the Greek agro-food sector can support such an increase of exports that they could cut the deficit further. This column has repeatedly underlined the potential of the agro-food sector (both the land and the processing industry) to not only further decrease the deficit but to make it a surplus.

4.1.3. Geographical distribution of agro-food trade

Table 4.1.2 below shows that the economic crisis of the previous years has not significantly affected the geographical structure of the agro-food trade. Agro-food imports come mostly from European Union (EU) countries (75-78%) while the remaining 22-25% comes from third countries. Agro-food exports go mostly to EU countries (70-72%) and the remaining 28-30% goes to non-EU countries. The main characteristic of the agro-food trade last year was the increase of the imports and the marginal decrease of the exports (mainly of olive oil, as will be shown in the next section). Exports to non-EU countries had a slight increase of 1%.

The direct consequence of these developments is the considerable increase of the agro-food trade deficit. While the deficit declined at an average annual rate of 20.5% during the period 2008-2016, in 2017 it increased by 84.6%. It is interesting that the agro-food trade with non-EU countries has had a surplus for the last few years, although this surplus is continuously shrinking. Last year it declined by 36.0%.

4.1.4. Structure of agro-food products trade

The most important feature of agro-food imports in 2017 was the significant increase of meat and dairy products imports. It is well known that the Greek livestock sector does not have the capacity to cover domestic demand, especially bovine and porcine demand. For many decades now, the livestock sector has not been able to increase its production and compete with the production of other European counterparts such as France, Germany or the Netherlands, which are the main import sources. In 2017 imports of meat and dairy products reached € 2.1 billion, that

TABLE 4.1.2 Geographical distribution of agro-food trade (in million €)

	2008	2010	2012	2013	2014	2015	2016	2017	% annual change rate 2008-2016	% change 2016-2017
						Imports				
Total	7,054	6,299	6,335	6,537	6,488	6,313	6,621	6,998	-0.8	5.7
EU	5,295	4,947	4,903	5,082	5,102	4,841	5,086	5,382	-0.5	5.8
Non-EU	1,758	1,352	1,432	1,455	1,385	1,472	1,535	1,616	-1.7	5.3
% EU	*75.1*	*78.5*	*77.4*	*77.7*	*78.6*	*76.7*	*76.8*	*76.9*		
% Non-EU	*24.9*	*21.5*	*22.6*	*22.3*	*21.4*	*23.3*	*23.2*	*23.1*		
						Exports				
Total	4,011	4,406	5,241	5,415	5,176	5,717	6,136	6,103	5.5	-0.5
EU	2,783	2,954	3,424	3,692	3,539	4,061	4,422	4,372	6.0	-1.1
Non-EU	1,228	1,452	1,817	1,723	1,636	1,657	1,715	1,731	4.3	1.0
% EU	*69.4*	*67.1*	*65.3*	*68.2*	*68.4*	*71.0*	*72.0*	*71.6*		
% Non-EU	*30.6*	*32.9*	*34.7*	*31.8*	*31.6*	*29.0*	*28.0*	*28.4*		
						Balance				
Total	-3,043	-1,893	-1,094	-1,122	-1,312	-596	-485	-895	-20.5	84.6
EU	-2,513	-1,993	-1,479	-1,390	-1,563	-780	-664	-1,010	-15.3	52.0
Non-EU	- 530	100	385	268	251	185	180	115	*	-36.0

Source: Hellenic Statistical Authority (ELSTAT), own calculations.

* Due to changes in the sign, the calculation of the rate of change is not possible.

is 30% of the total € 7 billion agro-food imports. It is worth noting that the rise in the value of meat and dairy products was mostly due to price increases, not quantity.

The next most important category of agro-food products imports is fruits and vegetables, which has a share of 11.6% (Table 4.1.3). The increase in the value of fruit and vegetable imports is due mostly to quantity increases as their prices declined. Cereals come fourth, with a share of 9.6%, while fish rose to the fifth place after the increase of the import value, which was the result of price (rather than quantity) increases. Coffee, tea etc., after the increase of import values in 2016, last year declined considerably and reached the levels of previous years. Looking at Table 4.1.3, it becomes obvious that since 2008 the structure of agro-food imports has not changed significantly.

Agro-food exports marginally declined by 0.5% in 2017. This decline is due to the decrease of olive oil exports, which is hardly a surprise especially after two consecutive highly productive years which raised the quantities exported. The value of the exported oils declined by 15.4% and was considerably mitigated by the increase of the international price of olive oil. The quantity exported in 2017 was 31.1% lower than the quantity exported in 2016. This column has often highlighted the importance of the development of the processing and marketing of olive oil, which could offer a significant boost in the price per unit of exported olive oil, thus further mitigating the year-to-year changes in olive oil production.

Fruits and vegetables are always, by far, the most exported agro-food product category and consistently comprise one third of the total agro-food exports. In 2017, although the exported quantity declined by 9.3%, the value of exports increased marginally due to the price increases of the products. Fish climbed to the second place with a share of 11%, increasing their exports both in value and quantity. Dairy products continue their dynamic increase in exports, reaching for the first time a share above 10%.

TABLE 4.1.3 Imports of agro-food product categories in million € (M €)

	2008		2010		2013		2014		2015		2016		2017	
	M €	%	M €	%	M €	%	M €	%	M €	%	M €	%	M €	%
Meat products[a]	1,211	17.2	1,160	18.4	1,179	18.0	1,162	17.9	1,117	17.7	1,150	17.4	**1,242**	**17.7**
Dairy	808	11.5	770	12.2	847	13.0	842	13.0	752	11.9	749	11.3	**856**	**12.2**
Fruits-Vegetables	786	11.1	672	10.7	642	9.8	663	10.2	731	11.6	748	11.3	**812**	**11.6**
Cereals	681	9.7	541	8.6	595	9.1	532	8.2	554	8.8	615	9.3	**673**	**9.6**
Fish	428	6.1	384	6.1	351	5.4	378	5.8	375	5.9	432	6.5	**489**	**7.0**
Coffee, tea, etc.	365	5.2	376	6.0	404	6.2	442	6.8	472	7.5	547	8.3	**425**	**6.1**
Feeding stuff	406	5.8	371	5.9	400	6.1	403	6.2	401	6.4	423	6.4	**407**	**5.8**
Various foodstuff	344	4.9	356	5.7	346	5.3	367	5.7	352	5.6	354	5.3	**347**	**5.0**
Beverages	436	6.2	370	5.9	257	3.9	248	3.8	255	4.0	281	4.2	**318**	**4.5**
Tobacco	335	4.7	310	4.9	234	3.6	236	3.6	301	4.8	323	4.9	**305**	**4.4**
Oils and fats	290	4.1	232	3.7	264	4.0	274	4.2	264	4.2	244	3.7	**291**	**4.2**
Sugars	225	3.2	220	3.5	278	4.3	227	3.5	207	3.3	231	3.5	**251**	**3.6**
Oil seeds	224	3.2	173	2.7	238	3.6	220	3.4	211	3.3	193	2.9	**203**	**2.9**
Raw materials	130	1.8	111	1.8	116	1.8	121	1.9	123	1.9	132	2.0	**142**	**2.0**
Wood	262	3.7	148	2.3	113	1.7	118	1.8	124	2.0	135	2.0	**127**	**1.8**
Hides-skins	93	1.3	76	1.2	147	2.2	116	1.8	56	0.9	46	0.7	**86**	**1.2**
Total	**7,054**[b]		**6,299**		**6,537**		**6,488**		**6,313**		**6,621**		**6,998**	

Source: Hellenic Statistical Authority (ELSTAT), own calculations.

a. Includes live animals and meat products.
b. The sum of values for each product may not equal to 'Total' because some categories with insignificant values such as cotton, natural rubber, other natural textile fibers, wool and jute are not included.

As mentioned above, exports of oils significantly decreased, as expected, after two consecutive years of increased production and exports. Besides oil exports, tobacco and cereal exports also declined. The exported quantity of cereals dropped by 40%, but their per-unit price increase limited the export value decline to just 14%. Similarly, the quantity of tobacco exports decreased by 14.5% while its price increase almost halved the drop at export value (7.7%). Overall, most categories of agro-food products exports increased in value, but these increases were neutralized by the considerable decline of oil, cereal and tobacco exports (Table 4.1.4).

4.1.5. Conclusions

Although total agro-food exports marginally declined in 2017, it is a positive development that most agro-food product categories increased their exports. It is very promising that during the years of economic crisis agro-food exports have increased over 50% since 2008. Comparatively, all other products' exports (except agro-food) have increased by 20% between 2008 and 2016. This is indicative of the dynamism of the agro-food sector. It is true that during 2017, the first year with a positive GDP change after many years of continuous contraction of the economy, all other products' exports increased considerably, by 11%. This is very good and it should be continued given that exports growth is a major indicator of economic growth.

A final remark is about imports. Imports growth is not necessarily a bad thing. On the contrary, it shows the level of wealth of a nation. It goes without saying that imports should not be a result of unsustainable borrowing, which was the case in pre-crisis Greece and one of the reasons the country went bankrupt.

TABLE 4.1.4 Exports of agro-food product categories in million € (M €)

	2008		2010		2013		2014		2015		2016		2017	
	M €	%	M €	%	M €	%	M €	%	M €	%	M €	%	M €	%
Fruits-Vegetables	1,346	33.6	1,485	33.7	1,856	34.3	1,826	35.3	1,846	32.3	1,966	32.0	**1,969**	**32.3**
Fish	449	11.4	541	12.3	562	10.4	556	10.7	590	10.3	661	10.8	**674**	**11.0**
Dairy	275	6.9	301	6.8	416	7.7	483	9.3	561	9.8	593	9.7	**634**	**10.4**
Oils and fats	333	8.3	287	6.5	580	10.7	322	6.2	714	12.5	674	11.0	**570**	**9.3**
Tobacco	416	10.4	374	8.5	392	7.2	386	7.5	450	7.9	524	8.5	**484**	**7.9**
Cereals	315	7.9	292	6.6	270	5.0	338	6.5	303	5.3	421	6.9	**361**	**5.9**
Cotton	236	5.9	391	8.9	377	7.0	310	6.0	299	5.2	316	5.1	**355**	**5.8**
Various foodstuff	124	3.1	161	3.7	206	3.8	221	4.3	236	4.1	253	4.1	**282**	**4.6**
Beverages	163	4.1	166	3.8	192	3.5	198	3.8	209	3.7	205	3.3	**222**	**3.6**
Meat products[a]	76	1.9	67	1.5	74	1.4	84	1.6	84	1.5	95	1.5	**109**	**1.8**
Sugars	54	1.3	129	2.9	96	1.8	71	1.4	77	1.3	91	1.5	**96**	**1.6**
Coffee, tea, etc.	30	0.7	34	0.8	64	1.2	60	1.2	78	1.4	86	1.4	**80**	**1.3**
Oil seeds	76	1.9	64	1.5	79	1.5	86	1.7	96	1.7	81	1.3	**75**	**1.2**
Hides-skins	38	0.9	40	0.9	87	1.6	64	1.2	73	1.3	69	1.1	**73**	**1.2**
Feeding stuff	51	1.3	41	0.9	59	1.1	58	1.1	54	0.9	58	0.9	**61**	**1.0**
Raw materials	18	0.4	20	0.5	32	0.6	34	0.7	37	0.6	35	0.6	**46**	**0.8**
Wood	9	0.2	7	0.2	10	0.2	10	0.2	8	0.1	6	0.1	**10**	**0.2**
Total	**4,011**[b]		**4,406**		**5,415**		**5,176**		**5,717**		**6,136**		**6,103**	

Source: Hellenic Statistical Authority (ELSTAT), own calculations.

a. Includes live animals and meat products.
b. The sum of values for each product may not equal to 'Total' because some categories with insignificant values such as wool, natural rubber, other natural textile fibers and jute are not included.

Increased borrowing increases debt and undermines future generations' financial sustainability. Imports should be the result of a virtuous cycle of increased production, which means increased exports as well as other income that flows into the country (e.g. tourism, shipping, etc.).

KEPE, *Greek Economic Outlook,* issue 36, 2018, pp. 52-58

4.2. The development of the transport fuels market for the 2016-2017 period and the impact from the Excise Duty increase

Vassilis Lychnaras

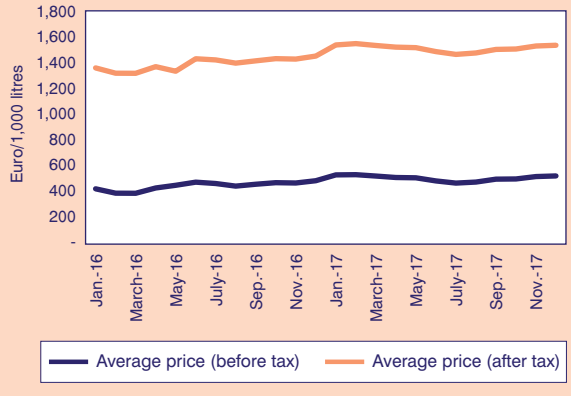
4.2.1. Introduction

A main characteristic of the Greek liquid fuel market is that, despite the significant capacity of the Greek refineries, our country still depends mainly on imports of crude oil. Therefore, the domestic market acts as price recipient of the international oil market and any changes in international oil prices have a direct impact on our market. On the other hand, another important factor that affects the final consumer price of fuels in our country is fuel taxation, and mainly the Excise Duty and the VAT. Following the evolution of liquid fuel prices over the last two-year period, 2016-2017, there was a limited increase in international prices that led to an increase in domestic prices before taxes. Additionally, there was an increase of fuel Excise Duties, starting from January 2017. More specifically, the Excise Duty of unleaded petrol increased from 670 to 700 euro/1,000 litres, while of automotive diesel, it increased from 330 to 410 euros/1,000 litres. As a result, the final price of fuel increased for the consumer. This article aims at recording the price trend, the impact of taxation and the evolution of consumption of the main liquid transport fuels of the domestic market, and in particular unleaded petrol and automotive diesel, during the latest two-year period, 2016-2017. At the same time, it examines the status of Greece in relation to the other EU28 member states, in terms of prices and taxation on transport fuels.

4.2.2. Evolution of prices and taxes on liquid fuels

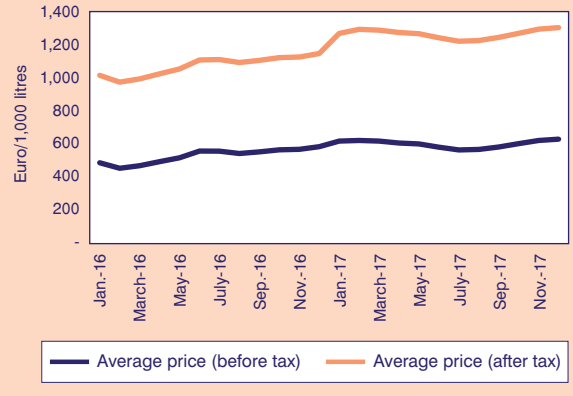
This paragraph records the evolution of prices of unleaded petrol and automotive diesel, on a monthly and annual basis, for 2016 and 2017. It also presents the tax share as a percentage of the annual average final price of fuels. In particular, monthly, as well as annual average prices, before and after taxes, are calculated in euro/1,000 litres. At the beginning, Figures 4.2.1 and 4.2.2 record the monthly evolution of prices, before and after tax, for unleaded petrol and automotive diesel, respectively. Regarding price trend, there is a limited upward trend for both be-

FIGURE 4.2.1
Monthly average price of unleaded petrol 2016-2017 (in euro/1,000 litres)



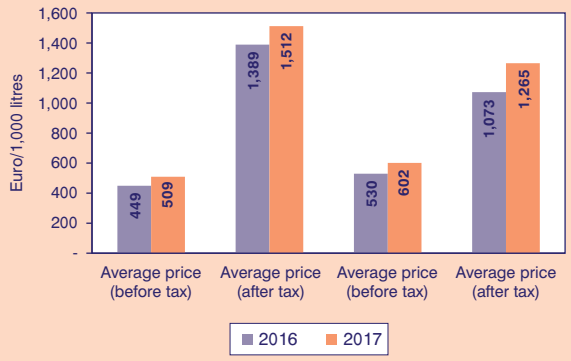
Source: Own processing of data from European Commission, Energy, Market Observatory & Statistics, *Oil Bulletin* <http://ec.europa.eu/energy/observatory/oil/bulletin_en.htm>.

FIGURE 4.2.2
Monthly average price of automotive diesel 2016-2017 (in euro/1,000 litres)



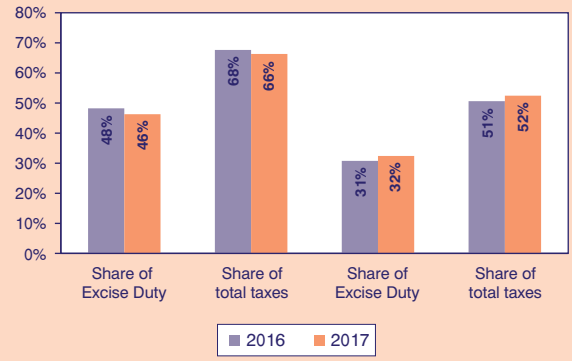
Source: Own processing of data from European Commission, Energy, Market Observatory & Statistics, *Oil Bulletin* <http://ec.europa.eu/energy/observatory/oil/bulletin_en.htm>.

FIGURE 4.2.3
Annual average price of liquid transport fuels 2016-2017 (in euro/1,000 litres)



Source: Own processing of data from European Commission, Energy, Market Observatory & Statistics, *Oil Bulletin* <http://ec.europa.eu/energy/observatory/oil/bulletin_en.htm>.

FIGURE 4.2.4
Percentage of the tax share in the final prices of liquid transport fuels, 2016-2017



Source: Own processing of data from European Commission, Energy, Market Observatory & Statistics, *Oil Bulletin* <http://ec.europa.eu/energy/observatory/oil/bulletin_en.htm>.

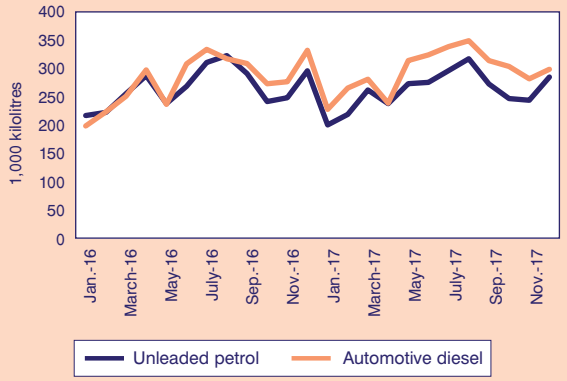
fore and after tax prices, for the two categories of the fuels. A more general picture of the evolution of prices during the latest two years is presented in Figure 4.2.3, which shows the average annual prices of the two fuels. On an annual basis for the unleaded petrol, a 13.4% increase of the price before tax and an 8.8% increase of the final price are recorded between 2016 and 2017. Similarly, as regards automotive diesel, there was a more important increase on the average annual prices between 2016 and 2017. The price before taxes increased by 13.6%, while the final price increased by 18%.

From the figures above, we notice, first, the great difference between prices before and after tax for both fuels. This is clearer in the case of unleaded petrol, because of the higher Excise Duty. Another important observation from Figure 4.2.3 is that, due to the difference in taxation levels between the two types of fuel, even if the price of unleaded petrol before tax is lower than that of automotive diesel, the final prices of the fuels are exactly opposite. Regarding the taxes and other charges as a share of the final fuel prices, Figure 4.2.4 shows the percentage of the Excise Duty, as well as the percentage of total taxes and charges on the final price. As shown, for unleaded petrol, in 2016, the Excise Duty represented 48% of the final annual average price, while the total taxes covered 68% of the price. For 2017, the corresponding figures were 46% for the Excise Duty and 66% for the total tax share. We can see that, even if the Excise Duty increased by 4.5%, the share of taxes in the final price decreased, due to the simultaneous increase of the price before tax. Regarding diesel, the share of the Excise Duty on the final prices increased from 31% in 2016 to 32% in 2017. Additionally, the share of total taxes covered 51% of the final price in 2016 and increased to 52% in 2017. In this case, the significant change in the Excise Duty, by 24.2%, had a stronger and clearer effect on the final price.

4.2.3. Evolution of the consumption of liquid transport fuels

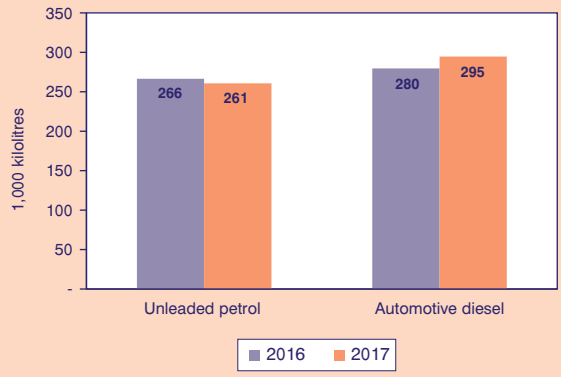
This section reports the monthly and annual consumption of unleaded petrol and automotive diesel for the period 2016-2017. First, Figure 4.2.5 records the monthly consumption of the two types of fuel. It can be seen that the consumption of the two fuels is roughly at the same level and follows similar trends. Additionally, Figure 4.2.6 presents the total annual consumption of the two fuels and shows that the consumption of unleaded petrol tends to be a little lower than that of diesel. In fact, in 2017, the consumption of unleaded petrol decreased by 2.2% compared to 2016, while the consumption of automotive diesel increased by 5.4%. It seems that even the increase in the final price of diesel in 2017, not only did not decrease its consumption, but it increased significantly. This shows that it was a result of other parameters apart from price, such as, for example, the increased sales of new vehicles during 2017, especially diesel cars. Nevertheless, the analysis of these parameters that affect diesel demand is out of the scope of this article.

FIGURE 4.2.5
Monthly consumption of transport fuels for 2016-2017 in thousands of kilolitres



Source: Processed data from the Independent Authority for Public Revenue (IAPR) and the General Accounting Office of the Ministry of Finance.

FIGURE 4.2.6
Annual consumption of transport fuels for 2016-2017 in thousands of kilolitres



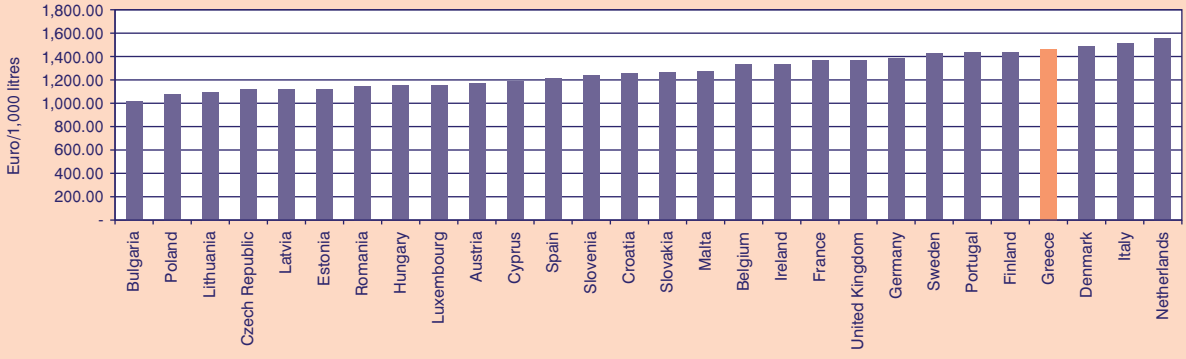
Source: Processed data from the Independent Authority for Public Revenue (IAPR) and the General Accounting Office of the Ministry of Finance.

4.2.4. The status of Greece in relation to the other EU28 member states

Another interesting issue is the status of Greece in relation to the other EU countries, regarding both the level of final fuel prices, as well as the share of taxes in the final price. The typical prices of the last record for 2016 (19/12/2016) and 2017 (18/12/2017), for the EU28 member states, are presented below. At this point, we should note that these figures are only indicative, because they result from data on a specific day and do not show the average prices for the two-year period under examination. However, one can extract useful conclusions from the comparison of the figures among different countries.

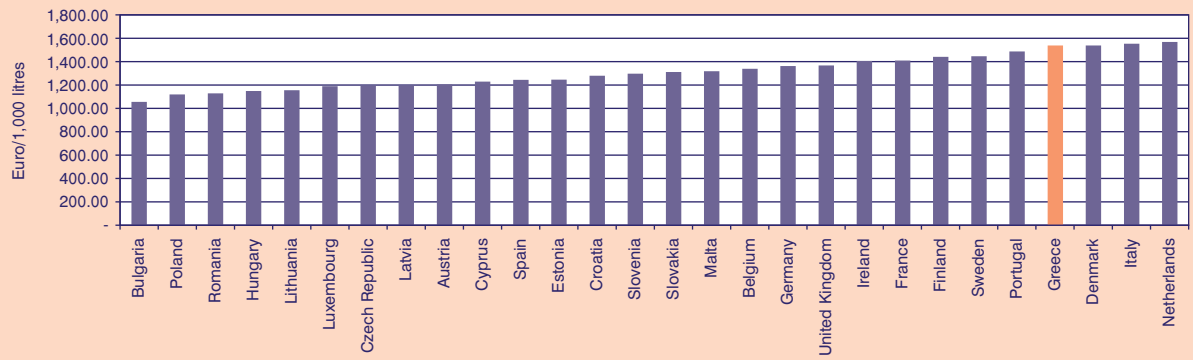
As shown in Figures 4.2.7 and 4.2.8, the price of unleaded petrol in Greece at the end of 2016 and 2017, is one of the highest prices among EU28 countries. The price recorded for Greece on 19/12/2016 was 1,466 euro/1,000 litres, while the average price for EU28 was 1,353 euro/1,000 litres. Respectively, on 18/12/2017, the price of unleaded petrol in our country was 1,534 euro/1,000 litres, while the EU28 average was 1,363 euro/1,000 litres. On the contrary, the automotive diesel price for the end of 2016 in Greece is a little lower than the European average

FIGURE 4.2.7
Final price of unleaded petrol on 19/12/2016 (in euro/1,000 litres)



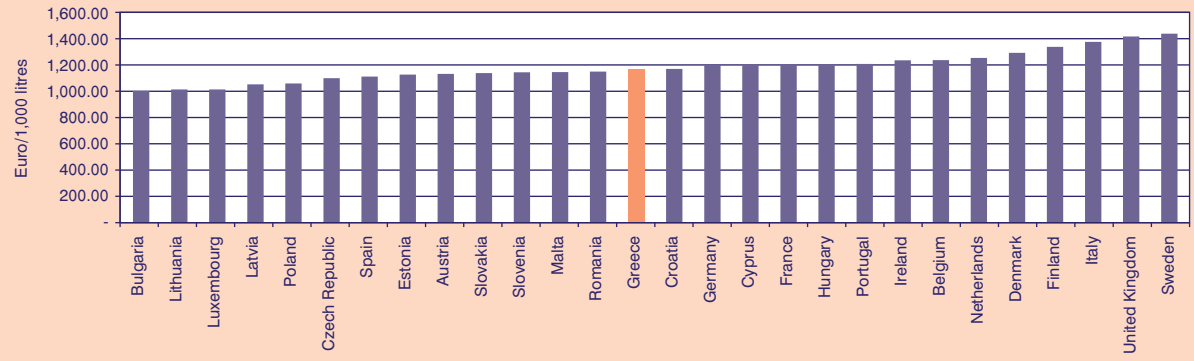
Source: European Commission, Energy, Market Observatory & Statistics, *Oil Bulletin* <http://ec.europa.eu/energy/observatory/oil/bulletin_en.htm>.

FIGURE 4.2.8
Final price of unleaded petrol on 18/12/2017 (in euro/1,000 litres)



Source: European Commission, Energy, Market Observatory & Statistics, *Oil Bulletin* <http://ec.europa.eu/energy/observatory/oil/bulletin_en.htm>.

FIGURE 4.2.9
Final price of automotive diesel on 19/12/2016 (in euro/1,000 litres)

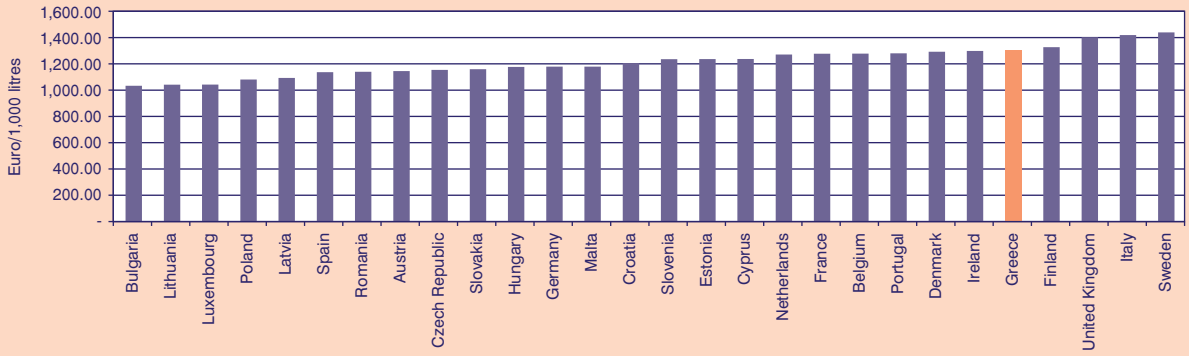


Source: European Commission, Energy, Market Observatory & Statistics, *Oil Bulletin* <http://ec.europa.eu/energy/observatory/oil/bulletin_en.htm>.

(Figure 4.2.9). In particular, the price on 19/12/2016 was 1,161 euro/1,000 litres in Greece and the corresponding average of EU28 was 1,216 euro/1,000 litres. However, the increase in the Excise Duty of diesel since January 2017 resulted in a significant increase in the final fuel price compared to other European countries and led Greece to the highest price levels (Figure 4.2.10). More specifically, on 18/12/2017, the final price for our country was 1,303 euro/1,000 litres, while the average for EU28 member state was 1,250 euro/1,000 litres.

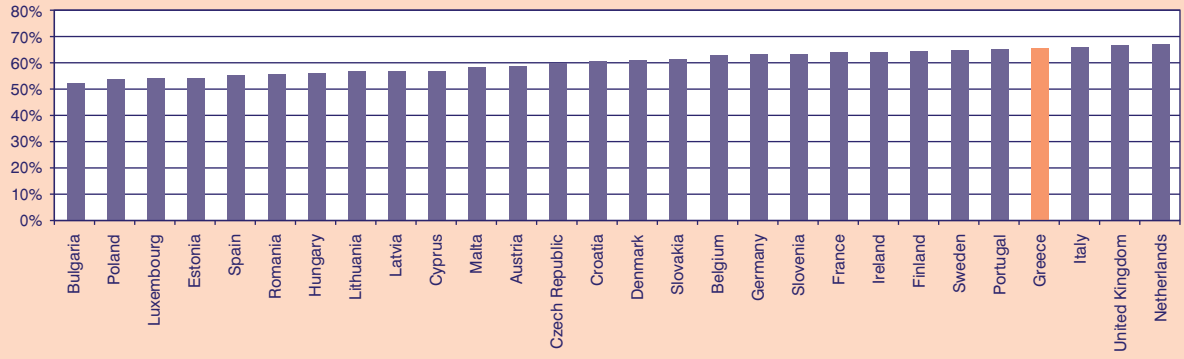
The following figures present the position of Greece among the EU28 member states, regarding the share of total taxes and charges on the final price of the fuels. As shown in Figures 4.2.11 and 4.2.12, Greece had one of the highest rates of taxation concerning unleaded petrol at the end of 2016. Thus, on 19/12/2016 the share of total taxes and charges on the final price in Greece was 65.7%, while the average for EU28 countries was 63.4%. In 2017, the Excise Duty of fuels increased and Greece's position worsened in relation to the rest of the EU. More specifically, while the tax share of the price of unleaded petrol in Greece remained almost stable at 65.8%, the average share for the EU28 fell to 62.7%. On the other hand, regarding automotive diesel, at the end of 2016, our country had one of the lowest shares of taxation on the final price. Thus, on 19/12/2016 (Figure 4.2.13), taxes and charges covered 48.7% of the final price in Greece, while the average for the EU28 was 57.4%. Upon the increase of the Excise Duty for fuel in Greece since January 2017, the status of our country has worsened. Nevertheless, it remained at a

FIGURE 4.2.10
Final price of automotive diesel on 18/12/2017 (in euro/1,000 litres)



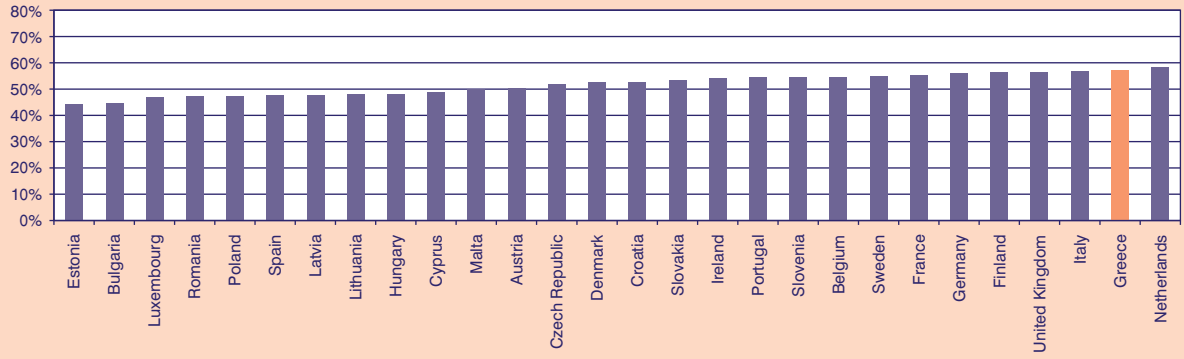
Source: European Commission, Energy, Market Observatory & Statistics, *Oil Bulletin* <http://ec.europa.eu/energy/observatory/oil/bulletin_en.htm>.

FIGURE 4.2.11
Percentage of the tax share in the final prices of unleaded petrol on 19/12/2016



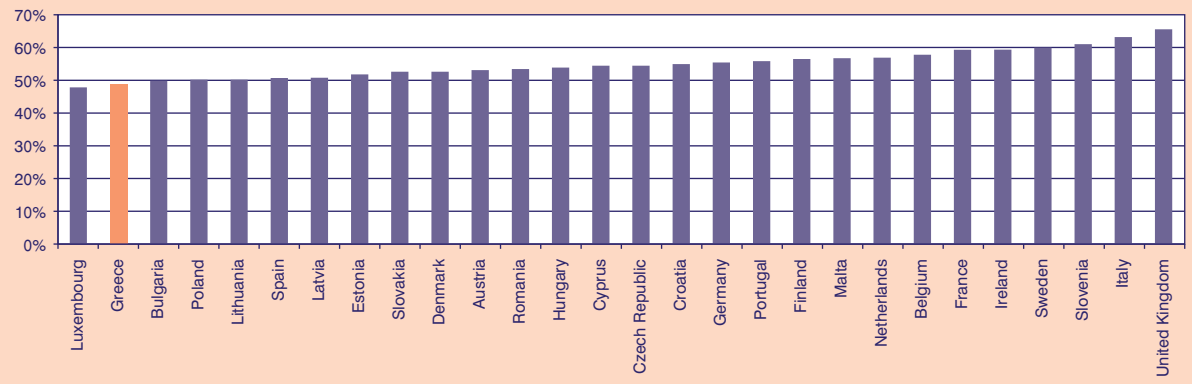
Source: European Commission, Energy, Market Observatory & Statistics, *Oil Bulletin* <http://ec.europa.eu/energy/observatory/oil/bulletin_en.htm>.

FIGURE 4.2.12
Percentage of the tax share in the final prices of unleaded petrol on 18/12/2017



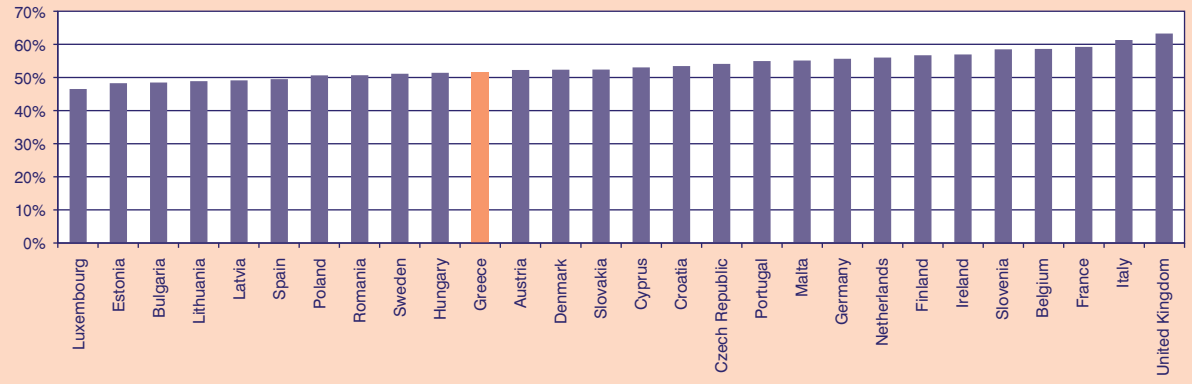
Source: European Commission, Energy, Market Observatory & Statistics, *Oil Bulletin* <http://ec.europa.eu/energy/observatory/oil/bulletin_en.htm>.

FIGURE 4.2.13
Percentage of the tax share in the final prices of automotive diesel on 19/12/2016



Source: European Commission, Energy, Market Observatory & Statistics, *Oil Bulletin* <http://ec.europa.eu/energy/observatory/oil/bulletin_en.htm>.

FIGURE 4.2.14
Percentage of the tax share in the final prices of automotive diesel on 18/12/2017



Source: European Commission, Energy, Market Observatory & Statistics, *Oil Bulletin* <http://ec.europa.eu/energy/observatory/oil/bulletin_en.htm>.

relatively low level compared to the other European countries. More specifically, on 18/12/2017, the tax share in the final price increased to 51.7%, while the corresponding average for the EU28 member states fell to 56.6% (Figure 4.2.14)

4.2.5. Summary conclusions

In the context of this work, we attempt to record the key issues regarding the evolution of the market of transport fuels, namely the price and consumption of unleaded petrol and automotive diesel during the latest two-year period, 2016-2017. A main reason for this analysis was the increase of the Excise Duty of fuels in January 2017 and its impact on final prices. We observe that there was a limited increase of fuel prices, both before and after tax, in 2017, compared to 2016. However, despite the increase in Excise Duty, the share of taxation on the final price did not change significantly, due to the simultaneous increase of the prices before tax. Additionally, the increase of prices did not have any particularly negative impact on consumption in 2017. In fact, the consumption of automotive diesel increased, despite the increase of its Excise Duty and the rise of the final price. This shows that there must be other parameters, apart from the price, such as the sales of new vehicles for example, which had a positive impact on demand. Finally, regarding the status of the country

in relation to the other EU member states, Greece remains one of the most expensive countries for unleaded petrol and also has one of the highest shares of taxation in the final price of fuel. On the contrary, regarding automotive diesel, and by the end of 2016, both the total price of fuel and its taxation in Greece were at the lowest levels compared to the rest of Europe. However, the country's position has worsened since the significant increase of the Excise Duty of diesel.

KEPE, *Greek Economic Outlook,* issue 36, 2018, pp. 59-70

Changes in inequality and poverty in Greece: 2007-2015

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Alexandros Karakitsios*
Panos Tsakloglou**

Abstract

The Greek crisis was the deepest and longest ever recorded in an OECD country in the post-war period. Output declined by over a quarter and disposable income by almost 40%, while the rate of unemployment exceeded 27%. The article explores the effects of the crisis on the level and the structure of aggregate inequality and poverty using the data of the EU-SILC for the period 2007–2015. The results show that inequality rose, but the magnitude of the change varies considerably across indices. The recorded increases are larger when the indices used are relatively more sensitive to changes close to the bottom of the income distribution. Unlike claims often made in the public discourse, the elderly improved their relative position in the income distribution while there was substantial deterioration in the relative position of the enlarged group of the unemployed. All poverty indicators suggest that poverty increased markedly, especially when "anchored" poverty lines are used. Substantial changes are observed regarding the structure of poverty. Despite an increase in the population share of households headed by pensioners, their contribution to aggregate poverty declined considerably, with a corresponding increase in the contribution of households headed by unemployed persons (or households with unemployed members). The changes are starker when distribution-sensitive poverty indices are utilized.

Key words: *poverty, inequality, Greece, economic crisis*

1. Introduction

Greece experienced the deepest and longest crisis among developed countries in the postwar period (Reinhart and Rogoff, 2009). According to Eurostat,[1] between the last year with a positive growth rate before the crisis (2007) and the last year covered by our analysis (2015), GDP per capita declined by 24.6% in real terms. However, a considerable part of the enormous consolidation effort undertaken since 2010 was based on tax increases that reduced the real incomes of the household sector both directly (income and property taxes) and indirectly (consumption taxes). As a result, the EU-SILC data used in the article suggest that during the same period the decline in real disposable income per capita was substantially larger, 35.2% (Graph 1).[2]

Naturally, such a deep and prolonged crisis is expected to affect both the living standards of various population groups in absolute terms and their relative position in the income distribution. "Poverty" and, to a lesser extent, "inequality" were almost constantly at the forefront of the public discourse in the years of the crisis. The main claims made in this discourse were that poverty and inequality rose steeply during the crisis and that successive wage and pension cuts led to

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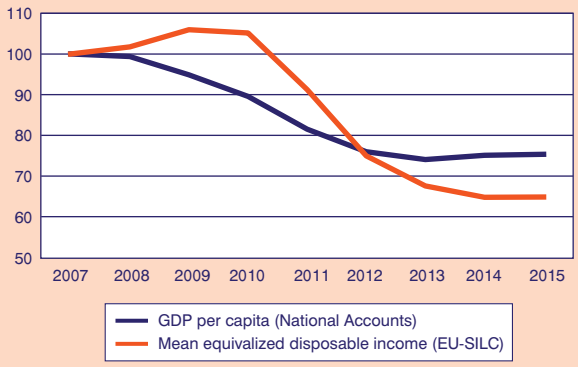
– The views expressed in the article are those of the authors and should not be attributed to the Council of Economic Advisors.

– Opinions or value judgments expressed in this article are the authors' own and do not necessarily reflect those of the Centre of Planning and Economic Research.

1. All references to Eurostat estimates are derived from <http://ec.europa.eu/eurostat/web/> or <http://ec.europa.eu/economy_finance/ameco/> accessed on various dates in March 2018.

2. GDP per capita is deflated using the GDP deflator while disposable income per capita is deflated using the Consumer Price Index. Note that in 2008 and 2009, due to lax fiscal policies, GDP declined while disposable income rose. If the fall in disposable income per capita is measured peak (2009) to bottom (2014), the proportional decline is even larger, 38.9%.

GRAPH 1
Evolution of GDP per capita and mean equivalized disposable income in real terms (2007:100)



Source: Eurostat, EU-SILC 2008-2016 (incomes 2007-2015), own calculations.

the impoverishment of large segments of the population, especially the elderly.

A number of empirical investigations can be found in the literature examining in depth the above claims, as well as the effects of particular policies adopted in recent years (Matsaganis and Leventi, 2013, 2014a, 2014b; Koutsogeorgopoulou et al., 2014; Mitrakos, 2014; Kaplanoglou, 2015; Katsikas et al., 2015; Kaplanoglou and Rapanos, 2018; Giannitsis and Zografakis, 2018). They use a variety of data and methods. Some use real data and some simulated estimates, while the observation period varies across studies and, hence, their results are not always strictly comparable. Nonetheless, they confirm that poverty rose during the crisis, especially when "anchored" poverty lines are used.

The present work is an extension and update of Andriopoulou et al. (2018) and aims to provide a picture of the changes in aggregate inequality and poverty in Greece between 2007 and 2015 (the last year for which information is available) using the data of the European Union Statistics on Income and Living Conditions (EU-SILC), as well as a decomposition of poverty and, to a lesser extent, inequality in 2007 and 2015 with a focus on the most important socioeconomic differences across groups. Section 2 provides a literature review. Section 3 deals with data and methodological issues. Section 4 presents and discusses our empirical findings, and Section 5 concludes.

2. Poverty and Inequality before the crisis

Inequality and poverty in Greece in the pre-crisis years were studied in quantitative terms in sufficient depth, using a number of data sets, primarily Household Budget Surveys, the European Community Household Panel (ECHP) and the EU-SILC (indicatively, Pashardes, 1980; Kanellopoulos, 1986; Tsakloglou, 1990, 1992, 1993, 1997; Sarris and Zografakis, 1993; Tsakloglou and Mitrakos, 1998, 2000, 2006; Tsakloglou and Panopoulou, 1998; Papatheodorou, 1998; Papatheodorou and Petmesidou, 2006; Mitrakos and Tsakloglou, 2000, 2012a, 2012b; Papatheodorou et al., 2008). Regarding inequality, the main findings were that, unlike many other developed countries, in Greece inequality had been gradually but not continuously declining since the mid-1970s, that inequalities "within population groups" were far more important in shaping aggregate inequality than inequalities "between population groups" irrespective of the partitioning criterion (with the possible exception of education) and that inequality in Greece was higher than in most EU countries.

When "relative" (or "floating") poverty lines were employed, poverty recorded a modest decline from the 1970s until the eruption of the crisis, while the decline was very substantial when the poverty line used was "anchored" in real purchasing-power terms. In the earlier years, poverty was primarily a rural phenomenon, while in more recent years, with the declining importance of the agricultural sector, the elderly became the largest group in poverty, although they did not experience extreme poverty. Relative poverty in Greece was found to be higher than the EU average, while there was evidence that poverty was, to some extent, "state dependent" (Andriopoulou and Tsakloglou, 2011, 2015). Nevertheless, for the majority of the people experiencing a fall below the poverty line, poverty was a transient phenomenon with poverty entries and exits affected by specific socioeconomic characteristics and events (demographic and labour market) (Andriopoulou and Tsakloglou, 2016). Considerable overlap could be observed between the groups of the "poor" and the "socially excluded" (Andriopoulou et al., 2013).

Finally, the redistributive role of the state in Greece was limited in comparison to other EU countries, with indirect taxation being regressive, social insurance contributions almost neutral and direct taxation and social transfers progressive (Tsakloglou and Mitrakos, 1998; Heady et al., 2001; Kaplanoglou and Newbery, 2003, 2008; Papatheodorou, 2006). At the same time, in-kind transfers in the field of public education and public health care had a substantial progressively redistributive effect (Paulus et al., 2010; Koutsampelas and Tsakloglou, 2013).

3. Data and methodology

The data used in the article come from the European Union Statistics of Incomes and Living Conditions

(EU-SILC) for the period 2007-2015. The EU-SILC is a harmonized cross-national longitudinal survey, carried out annually in all EU member-states. It contains detailed information on income, employment, health, education, housing, migration, social transfers and social participation, as well as socio-demographic characteristics of the participating households and their members.

The concept of resources used here is "disposable monetary household income", which is the sum of monetary incomes of all household members from all sources after the subtraction of direct taxes and social insurance contributions. Despite its popularity, monetary income is not necessarily the most appropriate concept of resources for distributional studies in turbulent periods (Deaton, 1993; Sen, 1995). In order to take into account differences in the needs of households with differences in size and composition, household incomes are standardized using the household equivalence scales used by Eurostat (they assign, respectively, weights of 1.0, 0.5 and 0.3 to the household head, each additional adult and each child –person aged below 14– in the household).[3]

Changes in the level of aggregate inequality are measured using the Gini index, the Mean Log Deviation (MLD) and two members of the Atkinson family of inequality indices for inequality aversion parameters 0.25 and 0.75 (ATK0.25 and ATK0.75, respectively). These indices satisfy the standard axioms of inequality measurement (symmetry, mean independence, population invariance and the principle transfers). Each index of inequality corresponds to a different Social Welfare Function and is relatively more sensitive to changes in different parts of the income distribution. Of the indices used here, the Gini index is relatively more sensitive to changes in the middle of the income distribution, ATK0.25 is more sensitive to changes close to the top of the distribution, while ATK0.75 and the MLD are more sensitive to changes close to the bottom of the distribution (Cowel, 2011). Further, MLD is "strictly additively decomposable"; that is, when the population is partitioned in non-overlapping and exhaustive groups using a particular criterion (demographic, occupational, etc.), it allows the identification of the contribution of each population group to aggregate inequality as well as the identification of the contribution of disparities between population groups to aggregate inequality (Shorrocks, 1980; Anand, 1983; Tsakloglou, 1993). Hence, MLD is used for the analysis of the structure of inequality.

For the purposes of poverty analysis we rely on the use of the Foster et al. (1984) parametric family of indices (FGT) when setting the value of the poverty aversion parameter to 0, 1 and 2 (FGT0, FGT1 and FGT2). FGT0 is the most well-known index of poverty –the poverty rate, which is the proportion of the population that falls below the poverty line. FGT1 is the "income gap ratio", which is the share of the total income that would be needed to eliminate poverty. FGT1 is not sensitive to the extent of inequality among the poor (and, hence, to the extent of extreme poverty), while FGT0 is sensitive to neither the average depth of poverty nor the extent of inequality among the poor. Of the indices used here, only FGT2 satisfies the standard axioms of poverty measurement (focus, symmetry, monotonicity, ranked deprivation, normalization and transfer; Seidl, 1988).

Although all members of the Foster et al. (1984) family of indices are "additively decomposable" (that is, they can identify the contribution of each population group to aggregate poverty when the population is grouped into non-overlapping and exhaustive groups), due to space limitations, we rely on FGT0 and FGT2 to analyse the structure of poverty.

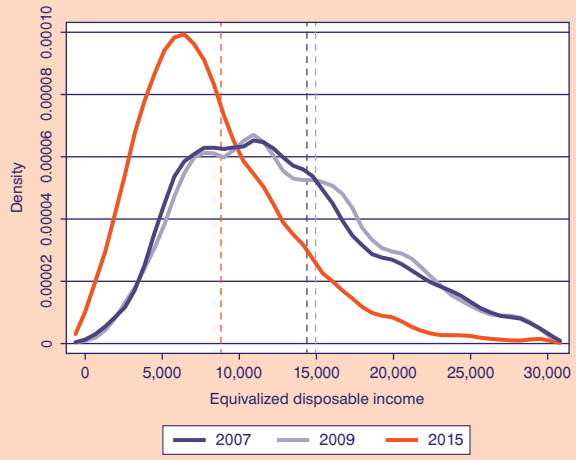
Unlike inequality, which is a "relative" concept, poverty can be used in "relative" or "absolute" terms.[4] Hence, when examining inter-temporal changes in the level and structure of poverty, we use both "floating" and "anchored" poverty lines. The "floating" poverty lines used are those of Eurostat that set the poverty line equal to 60% of the median equivalized income of the contemporaneous income distribution. The "anchored" poverty line is the poverty line of the base year (2007) adjusted for the cost of living for each subsequent year.[5]

3. Following the practice of the Luxembourg Income Study (LIS) database, we removed households with equivalized incomes less than 1% and more than ten times the mean equivalized income of the corresponding distribution ("top and bottom coding"). The number of households removed from the sample does not vary substantially across years and the results do not depend on this treatment. Note that all inequality and most poverty indices cannot be calculated if there are negative income values in the sample.

4. In other words, a population member may be unable to reach a particular fixed in time and/or space standard of living ("poverty in absolute terms") or his/her standard of living is quite low in comparison with the reference population ("poverty in relative terms").

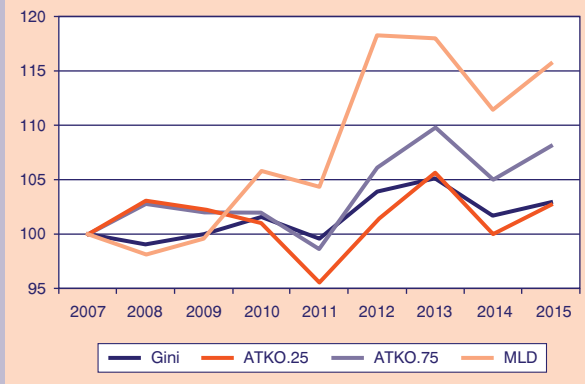
5. The year 2007 was selected as a reference year due to the fact that it was the last year with a positive growth rate before the emergence of the economic crisis. This does not mean that we consider the level of welfare of that year as sustainable, because it was based on extremely high "twin deficits" (budget and current account).

GRAPH 2
Kernel density function & mean values for years 2007, 2009 and 2015



Source: Eurostat, EU-SILC 2008-2016 (incomes 2007-2015), own calculations.

GRAPH 3
Inequality trends (2007-2015)



Source: Eurostat, EU-SILC 2008-2016 (incomes 2007-2015), own calculations.

4. Empirical results

4.1. Inter-temporal changes

4.1.1. Changes in income distribution

Graph 2 presents the distributions of equivalized disposable income per capita for 2007 and 2015 in constant prices using kernel density functions. A massive shift of the distribution to the left is evident. A higher concentration is observed around the mode in 2015 than in 2007 that, *prima facie*, could be an indication of a decline in inequality. However, many more observations are concentrated close to the bottom of the distribution in 2015 than in 2007, operating in the opposite direction.[6]

4.1.2. Changes in aggregate inequality

Graph 3 depicts the evolution of the four inequality indices, when their values are standardized to 100 for the base year (2007). In the first three years (2007-2010), the changes in the indices are relatively small and not uniform– an indication of intersecting Lorenz curves. All indices decline between 2010 and 2011 and, in fact, the index that declines most is ATK0.25, indicating that the decline in top incomes was larger than the decline in the incomes of the rest of the population. This is probably the combined effect of a decline in profits and the steep tax increases that affected primarily the top end of the income distribution. In the next year, inequality rose sharply according to all indices; presumably the effect of the sharp increases in unemployment and the lack of adequate social protection for those affected. Interestingly, between 2012 and 2013 all indices record a substantial increase in inequality, apart from MLD which registers a very marginal decline. This is another indication of intersecting Lorenz curves, this time close to the bottom of the distribution. Finally, all indices record a robust decline between 2013 and 2014. This is probably the result of the stabilization in output and a marginal decline in unemployment in 2014, combined with specific policies targeted towards the poorest segments of the population in that year (income-related family benefits, a lump-sum, one-off "social dividend" to the poorest segment of the population). In 2015 all indices record a clear increase, probably due to the first package of fiscal consolidation measures of the 3rd bailout programme.

All in all, between 2007 and 2015 inequality rose by -15.6%, 8.1%, 2.7% and 3.0% according to MLD, ATK0.75, ATK0.25 and Gini, respectively. Careful inspection of the data reveals that between 2007 and 2015 there was a decline in the income shares of the two bottom deciles by -0.6 and -0.1 percentage points, respectively, but also of the top decile by -0.5 percentage points and a corresponding increase in the income shares of the seven middle deciles (results available from the authors on request).

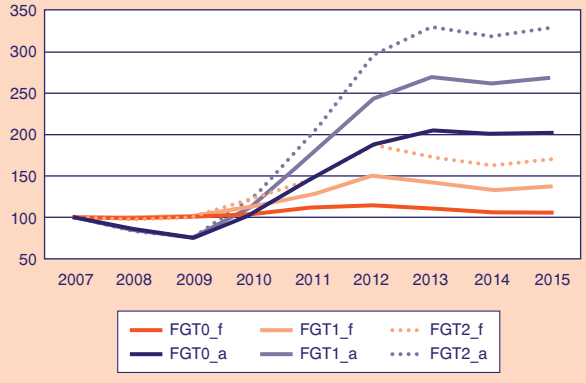
6. For exposition purposes, both distributions are cut off at the annual level of 30,000 euros per capita (in equivalized terms). Naturally, the distribution of 2007 has a fatter right tail above this threshold than the 2015 distribution.

4.1.3. Changes in aggregate poverty

Graph 4 presents the evolution of the three poverty indices using both "floating" (orange lines) and "anchored" (blue lines) poverty thresholds when their values are standardized to 100 for the base year (2007). When floating poverty lines are used, the indices remain stable for the first couple of years and then rise until 2012, but in a very different pattern. During this period, 2009-2012, the estimate of the poverty rate (FGT0), rises by almost 15% whereas the estimates of FGT1 and FGT2 rise by around 50% and 87%, respectively. Clearly, not only was there an increase in the share of the population falling below the poverty line, but also a decline in the incomes of the poor vis-à-vis the poverty line (increase in the "depth" of poverty) as well as an increase in inequality among the poor. In 2013 and 2014 all indices record a decline, while in 2015 FGT0 decreases while the two other indicators FGT1 and FGT2, capturing the depth of poverty, increase. The values of all indices are higher in 2015 than in 2007, but the differences in the proportional increases are substantial. FGT0 is 5.5% higher, while FGT1 and FGT2 are 37.4% and 69.9% higher, respectively.

The pattern is very different when the poverty line used is "anchored": that is, fixed in real terms to its value in 2007. In the first couple of years, all indices decrease substantially, by almost 25% cumulatively. However, in the period 2009-2013 their values rise sharply and they only decline a little in 2014. In 2015 FGT0 decreases, while FGT1 and FGT2 rise. In the end of the period under consideration, the respective values of FGT0, FGT1 and FGT2 are 101.4%, 168.1% and 228.7% higher than in 2007 –a tremendous increase that it is accounted for primarily by the decline in disposable incomes.

GRAPH 4
Poverty trends (2007-2015)



Source: Eurostat, EU-SILC 2008-2016 (incomes 2007-2015), own calculations.

4.2. Changes in the structure of inequality and poverty

4.2.1. Changes in population shares and mean group incomes

For the purposes of our analysis, the population is grouped using two criteria. The first criterion is the socio-economic group of the household head. Eight groups are formed: Self-employed with employees, Self-employed without employees in the agricultural sector, Self-employed without employees outside agriculture, Private sector employees, Public sector employees, Unemployed, Pensioners and Other. In Table 1, the first two columns report the group population shares in 2007 and 2015, respectively, while the next two show the group mean incomes, normalized by the national average of the corresponding year.

The main effect of the crisis was the spectacular rise in the unemployment rate. Despite high growth rates before the crisis, the rate of unemployment in 2007 was quite high, 8.4%. By 2015 it had reached 25.7%.[7] This is reflected in our data. Between 2007 and 2015 the share of the population living in households headed by unemployed persons rose from 2.2% to 9.4%. Furthermore, even though the mean income of the group was only 64% of the national average in 2007, it dropped to 53% in 2015. This should be attributed partly to the fact that between these years long-term unemployment shot up (in 2015 over three-quarters of the unemployed were long-term unemployed) and the income protection for this group was almost non-existent. Besides the gradual ageing of the population, during the crisis, a considerable proportion of people who were close to retirement chose to exit the labour market and take early retirement. In our data, this is reflected in the rise of persons living in households headed by pensioners from 28.9% to 33.6%. However, unlike what is often heard in the public discourse, the relative income position of this group rose during the crisis (even though it decreased substantially in real terms). In 2007, on average, the members of this group had incomes 5% lower than the population mean. By 2015 their incomes were 7% higher than the national average.

7. It had peaked two years earlier at 27.5%.

TABLE 1 Population shares and group mean incomes

Population group	Population share		Mean income	
	2007	2015	2007	2015
Socio-economic group of household head				
Employer	7.3	4.7	1.35	1.27
Self-employed (agriculture)	5.8	4.7	0.65	0.68
Self-employed (non-agriculture)	3.6	3.1	1.00	1.04
Employee (private sector)	31.4	25.1	1.01	1.04
Employee (public sector)	9.4	9.2	1.24	1.23
Unemployed	2.2	9.4	0.64	0.53
Pensioner	28.9	33.6	0.95	1.07
Other	11.4	10.2	0.91	0.92
Households with/without unemployed				
No unemployed in household	88.1	69.8	1.03	1.13
At least 1 unemployed in household	11.9	30.2	0.78	0.71
GREECE	**100.0**	**100.0**	**1.00**	**1.00**

Source: Eurostat, EU-SILC 2008-2016 (incomes 2007-2015), own calculations.

Naturally, the increase in the share of these two groups was counterbalanced by the decline in the share of the population living in households with employed heads. This effect was not symmetric for all groups. One distinguishing feature of the Greek labour market is the large share of the self-employed. According to Eurostat, the share of the self-employed among all employed persons in Greece is by far the largest in the EU. The corresponding share in Greece was 28.9% in 2007 and, despite a substantial decline in the number of self-employed in absolute terms, rose to 33.6% in 2015, versus 15.0% in the EU27 in both years, using Eurostat figures. Reflecting the small size of the average Greek firm, the share of self-employed with employees among all employed persons was substantially higher in Greece than in the EU27 (7.3% vs 4.7%). The effects of the crisis on small firms were devastating and the number of self-employed with employees declined by almost 40% in the period under examination. These changes are reflected in the estimates reported in the first two columns of the table. The shares of the population living in all types of households headed by employed persons declined –far more so those for those headed by self-employed with employees and private sector employees. The relative mean incomes of these groups in comparison to the national average did not change considerably during the crisis, with population members living in households headed by self-employed with employees and public sector employees being substantially above the national average, while those living in households headed by self-employed in the agricultural sector had monetary incomes below two thirds of the national average (however, unlike the rest of the population, they are likely to have in-kind incomes in the form of consumption of their own agricultural production).[8]

The second panel of the table is, essentially, a companion to the first panel and refers to the second partitioning criterion used. As noted earlier, a very large proportion of the unemployed are not household heads and there are many households with unemployed members. In this panel the partitioning criterion is the presence of

8. The evidence of the columns of the upper panel of Table 1 seems to run contrary to two popular myths used in the public discourse: (a) that during the crisis there was a substantial migration of unemployed persons from urban areas to rural areas in order to get involved in agricultural activities, and (b) that although public sector employees did not experience unemployment, they paid a very high price since their salaries were reduced far more than private sector salaries, with obvious consequences for their living standards in relative terms.

at least one unemployed member in the household. In 2007, 11.9% of the population was living in households with at least one unemployed member. By 2015 this figure had risen to 30.2%. Moreover, the relative mean income of this group declined from 78% to 71% of the mean national income.[9]

4.2.2. Inequality decomposition

Table 2 reports the results of inequality decomposition using MLD. The results reported in the first panel of the table show that the only group with a decline in inequality between 2007 and 2015 was that of the households headed by pensioners, while the only group whose contribution to aggregate inequality rose substantially was that of households headed by unemployed persons (from 2.6% to 13.5%). This is a consequence of both a rise in its population share and the level of inequality within the group. On the contrary, the contribution of the rather heterogeneous group of population members living in households headed by self-employed with employees and private sector employees declines,

TABLE 2 Structure of inequality

Population group	Inequality		% Contribution[10]		Change
	2007	2015	2007	2015	
Socio-economic group of household head					
Employer	33.3	35.1	13.3	7.8	-5.5
Self-employed (agriculture)	14.2	21.2	4.5	4.7	0.2
Self-employed (non-agriculture)	27.3	32.4	5.4	4.8	-0.6
Employee (private sector)	15.7	17.7	27.2	21.1	-6.1
Employee (public sector)	7.6	10.4	4.0	4.5	0.6
Unemployed	22.2	30.3	2.6	13.5	10.9
Pensioner	13.9	12.1	22.1	19.4	-2.7
Other	21.4	26.2	13.4	12.7	-0.6
"Within groups"	16.8	18.6	92.6	88.7	-3.9
"Between groups"	1.4	2.4	7.4	11.3	3.9
Households with/without unemployed					
No unemployed in household	17.8	17.1	86.2	56.7	-29.5
At least 1 unemployed in household	17.8	23.1	11.7	33.2	21.5
"Within groups"	17.8	18.9	97.9	89.9	-8.0
"Between groups"	0.4	2.1	2.1	10.1	8.0
GREECE	**18.2**	**21.0**			

Source: Eurostat, EU-SILC 2008-2016 (incomes 2007-2015), own calculations.

9. The population was also partitioned by household type, age of population member and education level of the household head. Due to space limitations, the results are not shown here but are available from the authors on request. They are in line with the results reported in Table 1. Between 2007 and 2015 there was an increase in the population share of elderly households and a decline in the share of households with children (due primarily to emigration –"brain drain"– and, to a lesser extent, population ageing), while there was an increase in the share of households with better educational qualifications. In terms of group mean incomes, there was a substantial improvement in the relative position of the elderly and the members of the households headed by persons with lower educational qualifications (usually, elderly).

10. The contribution of each population group shows the share (percentage) of the particular group in the formulation of total inequality (it is derived by dividing the inequality index for each group by the total inequality index for the whole population and by multiplying it with the share of each population group). The sum of contributions of the particular group is the percentage change "within groups" at the bottom of the panel. The remaining figure to reach 100% is the percentage change "between groups" (it equals the inequality index of the group assuming that all the members of the group have the mean income of the group and divided by the inequality index for the whole population, multiplied by 100).

primarily because of the declines in the population shares of these groups. In spite of the large increase in its population share, the contribution of the group of population members living in households headed by pensioners declines marginally. This, in turn, should be attributed to the decline in the level of inequality within the group, especially vis-à-vis the national average. Further, the contribution of "between socio-economic groups" disparities to aggregate inequality rose considerably. Whereas such disparities accounted for 7.4% of aggregate inequality in 2007, their contribution rose to 11.3% in 2014.

To some extent, the results in the second panel of Table 2 complement those reported in the first panel. As noted earlier, most unemployed persons are not household heads. This increased considerably the heterogeneity of the group of persons living in a household with at least one unemployed member. Hence, although inequality declined marginally in the group of persons living in households with no unemployed members, it rose substantially in the group of persons living in households with unemployed members. The latter combined with the sharp increase in the population share of the group leads to a staggering increase of its contribution to aggregate inequality from 11.7% to 33.2%. The increase in its population share combined with the decline in its relative mean income leads to a rise in the share of inequalities "between groups" from 2.1% in 2007 to 10.1% in 2015.[11]

4.2.3. Poverty decomposition

Table 3 presents changes in the structure of poverty between 2007 and 2015. The first two columns show the estimates of FGT0 (the poverty rate) for the various groups in 2007 and 2015 using contemporaneous ("floating") poverty lines, set at 60% of the median equivalized income of the population in the corre-

TABLE 3 Structure of poverty

Population group	FGT0		FGT0 Contribution %[12]		FGT2		FGT2 Contribution (%)	
	2007	2015	2007	2015	2007	2015	2007	2015
Socio-economic group of household head								
Employer	19.7	16.4	7.2	3.7	2.97	2.21	9.5	2.7
Self-employed (agriculture)	43.5	48.7	12.7	11.0	5.00	8.97	12.8	10.9
Self-employed (non-agriculture)	30.1	23.2	5.5	3.5	4.15	4.26	6.6	3.4
Employee (private sector)	16.2	18.9	25.7	22.7	1.78	2.77	24.6	18.0
Employee (public sector)	3.0	3.1	1.4	1.3	0.26	0.19	1.1	0.5
Unemployed	40.1	55.8	4.3	25.0	9.36	14.60	8.8	35.4
Pensioner	18.6	13.2	27.1	21.2	1.37	1.29	17.3	11.2
Other	27.7	25.1	15.9	12.3	3.84	4.66	19.2	12.4
Households with/without unemployed								
No unemployed in household	18.6	13.4	82.6	44.6	1.92	1.84	74.3	33.2
At least 1 unemployed in household	28.9	38.3	17.4	55.4	4.90	8.54	25.6	66.9
GREECE	**19.8**	**20.9**	**100.0**	**100.0**	**2.27**	**3.86**	**100.0**	**100.0**

Source: Eurostat, EU-SILC 2008-2016 (incomes 2007-2015), own calculations.

11. When inequality decomposition analysis is performed using other criteria, the most striking result is, probably, the sharp decline of the contribution inequality "between educational groups" to aggregate inequality from 20.9% to 13.0%.

12. The contribution of each population group shows the percentage contribution of this group to overall poverty according to the indicator used (it is derived from the group poverty index divided by the index value for the total population and multiplied by the population share of each group).

sponding year. As shown at the bottom of the table, in 2007, 19.8% of the population falls below the poverty line, while by 2015 this percentage rises to 20.9%.[13] The next two columns report the contributions of the corresponding groups to aggregate poverty according to FGT0. This exercise is replicated for FGT2, as shown in the remaining columns of the table. The estimate of FGT2, which unlike FGT0, is sensitive to both the distance of the poor from the poverty line and the extent of inequality among the poor, is 70% higher in 2015 vis-à-vis the estimate for 2007.

In 2007 there were two population groups with poverty rates exceeding the national average by a wide margin: members of households headed by self-employed without employees in the agricultural sector (43.5%) and unemployed persons (40.1%). Yet, due to their small population shares, the contributions of these groups to the aggregate poverty rate were small. The bulk of the poor could be found in households headed by pensioners (27.1%) and private sector employees (25.7%). By 2015 the situation was very different. The poverty rate of the group of persons living in households headed by unemployed individuals rose to 55.8%, while that of the members of households headed by pensioners dropped from 18.6% to 13.2%. As a consequence and combined with the changes in the population shares, there was a dramatic change in the composition of the poor. In 2015 the most important contributor to aggregate poverty was the group of persons living in households headed by unemployed individual (25.0%), while, despite the increase in its population share, the contribution of the group of individuals living in households headed by pensioners dropped to 21.2%. At the other extreme, in both years poverty appears to be a rare phenomenon in households headed by public sector employees.

Turning to the estimates derived using FGT2, it can be noticed that the relative rankings of the groups are relatively similar with those reported when FGT0 is used. However, the quantitative differences across groups are larger and broadly in line with the group mean incomes and their evolution reported in Table 1. In both cases, two groups stand out as high poverty-risk groups: members of households headed by self-employed in agriculture and members of households headed by unemployed persons. Nonetheless, in 2007, using FGT0, poverty appears to be more common in the former than in the latter group, whereas according to FGT2, the estimate for the latter group is almost twice as high as that of the former group. Apparently, extreme poverty was more common in the latter group. In fact, in both years, the FGT2 estimates for the former group were a little more than twice as high as the national average, whereas for the latter they were more than four times the national average.

Turning to the contributions to aggregate poverty, it is stunning to report that in 2015 the group of members of households headed by unemployed persons, which accounted for less than 10% of the total population, contributed over 35% to aggregate poverty. At the other extreme, the contribution of households headed by public sector employees (population share 8.3%) was almost non-existent (0.5%), while that of the group of households headed by pensioners, with a population share of 33.6%, was just 11.2%.

A similar picture emerges in the second panel of the table where the population is grouped according to the existence of unemployed members in the household. In both years, the group of individuals living in households with unemployed members faced a markedly higher poverty risk than the rest of the population, irrespective of the poverty indicator. Both relative risks vis-à-vis the national averages and contributions of the group to aggregate poverty rose markedly in 2015. As a consequence, this group, which included a little less than a third of all population members in 2015, accounted for around half of the poor and almost two-thirds of the recorded poverty when using FGT2.[14]

5. Conclusions

We examined developments in the levels and the structure of inequality and poverty in Greece during the recent crisis, using the information of EU-SILC. During the period under examination, 2007-2015, there was a decline in the income shares of the two lowest and the top decile. As a result, indices sensitive to the existence of very low incomes record a substantial increase in inequality, while indices that are relatively more sensitive to changes in the middle or the top of the distribution record a more modest increase in in-

13. These rates are marginally lower than those reported by Eurostat, 20.1% and 21.2%, respectively, due to the top and bottom coding procedure applied here.

14. Estimates of poverty decompositions using other partitions of the population and/or an “anchored” poverty line are available from the authors on request. They show a decline in the poverty risk and the contributions of the elderly and persons living in households headed by persons with low educational qualifications, and a corresponding increase in the risk and contributions of households with children and households headed by better educated persons.

equality. Relative poverty, measured using "floating" poverty lines, recorded an increase that appears to be quite substantial when distribution-sensitive poverty indices are utilized. Taking into account that disposable income declined by almost 40% in the period under examination, it is not surprising to find that poverty using "anchored" poverty lines shot up. Depending on the index and its sensitivity to the existence of very low incomes, the estimated poverty indices rose between 100% and 250%.

Changes in the structure of inequality and, particularly, poverty were driven primarily by the enormous increase in unemployment. Regarding its structure, both before and during the crisis, inequality emanated primarily from differences "within" rather than "between" population groups. During the crisis, the importance of differences between socio-economic groups in shaping aggregate inequality rose. With respect to the structure of poverty, the effects of the increase in unemployment are enormous. On the contrary, despite the decline in their income in absolute terms during the crisis, pensioners improved considerably their relative position, and their contribution to aggregate poverty declined substantially.

What are the driving forces behind the observed changes? The explanation can, probably, be found in Greece's social model. Greece was arguably the most typical case of the "Mediterranean male-breadwinner welfare state" in the "old" EU member-states. According to the OECD, Greece's labour market lacked flexibility. Even before the crisis, youth and female unemployment rates were the highest in the EU, but for as long as at least one family member –usually, the male breadwinner– had a formal attachment to the labour market, there was an internal redistribution of resources within the family and, hence, strong family ties acted as a social shock absorber. Even though welfare spending as a share of GDP rose sharply in the years before the crisis,[15] it was directed mainly to pensions. The redistributive effects of welfare spending in reducing poverty and inequality were marginal in comparison to other EU countries, and Greece's levels of inequality and poverty were among the highest in the EU.

The limitations of this system became evident when the crisis erupted. Many household heads lost their jobs and a considerable proportion of the population was left with limited or even zero financial resources. Unemployment insurance was flat, inadequate and provided for a limited period of time; long-term unemployment assistance was almost non-existent, and Greece was one of the very few members of the EU without a Minimum Income Guarantee scheme. Unsurprisingly, the experience of the crisis for several households with unemployed heads and/or unemployed members was a free fall without a safety net. This partly explains the sharp increase in the contributions of these groups to aggregate inequality and aggregate poverty when indices sensitive to the existence of very low incomes are utilized.

The only segment of the population with a minimum income guarantee in place was pensioners. During the crisis there were cuts in pensions. However, unlike what is often heard in the public discourse, the cuts in pensions were far lower than the decline in average incomes. This is evident in the substantial improvement of pensioner household incomes in relative terms during the crisis. Moreover, cumulatively and also unlike what is often heard in the public discourse, the cuts in pensions were anything but uniform. High pensions were cut proportionally far more than low-level pensions. This explains the decline in inequality among pensioner households during the crisis.

A number of measures aimed to mitigate the effects of the crisis were taken, but always under very hard budget constraints. Some of these measures were one-off, whenever financial resources were available (for example, the "social dividend"), some were more structural in nature (for example, the introduction of income-related family benefits, unemployment assistance for long-term unemployed workers and unemployment insurance for the self-employed). Furthermore, a scheme for the introduction of a generalized Minimum Income Guarantee scheme was also piloted during the period under examination. At the same time, many measures were taken to liberalize the labour market, in the expectation that they would boost employment. A number of simulation studies (see, for example, Matsaganis et al., 2017) seem to suggest that several of these measures had the intended effects, but were "too little, too late".

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15. According to Eurostat, the share of social welfare protection in GDP rose from 18.5% in 1995 to 26.6% in 2009. The rise continued in the first years of the crisis and in 2012 Greece's social welfare spending was the third highest in the EU.

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The significance and impact of the time and cost of (non-) collecting claims on receivables from non-performing bank loans (NPLs)

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Abstract

The aim of this article is to reveal the importance and the impact of the time and the cost of (non)collecting claims on receivables for the internal rate of return (IRR) of a portfolio of non-performing loans (NPLs). In the first part of the article the Greek legal framework, related with the rules of the compelled collective receivables from NPLs, is described. Then, the article presents an overview of the regulatory framework concerning the loans' collaterals, provided by the mandates of Basel II (2006) and Basel III (2011). In order to reveal the significance of the time and the cost of collecting receivables for the determination of the discount rate of the non-performing loans of the systemic banks, the article presents: a) a model of the internal rate of return (IRR) valuation concerning an NPL portfolio and b) an analogous sensitivity analysis. Finally, in the last part of the article, there are some conclusions related with the consequences from delays in collecting claims on receivables from the loans of the banking system.

Keywords: *Non-performing loans (NPLs), Greek legal framework of compulsory claims on receivables, sensitivity analysis.*

1. Introduction

The Greek debt and the high level of the non-performing loans (NPLs) of the Greek banking system, as underlined in almost all the recent reports of the major international organizations (e.g., OECD, IMF, EU), are considered as high priorities for the country. As regards to the first (debt), its decline (with respect to the Greek GDP) will require a dynamic increase of the country's potential output. But such improvement requires a structural reforming "verve", in order to lift all the malfunctions of the past which negatively affected the economic momentum of the country. On the other hand, the NPLs, at the beginning of 2018, remain high, as a percentage of total loan portfolios (almost 45%). This high level of NPLs creates a negative atmosphere for the expansion of a bank's credit growth. Thus, the gradual relief of the Greek banks from their NPLs is considered as a major prerequisite for the creation of a credible capital adequacy for the system. In this context, the new institutional framework, concerning the claims of receivables from NPLs, has a prime role in the acceleration of this process. Actually, this new institutional framework is expected to help the "governability" of the banks by reducing the direct and indirect costs related to their attached NPLs.

In Section 2 of this article, an overview of the legal framework concerning the collecting claims on receivables in Greece is presented. Then in Section 3, the regulatory framework, provided by the Basel II (2006) and the Basel III (2011), concerning the loans' collaterals, is discussed. In Section 4, with the help of a mathematical model, we discuss the effects of the implementation of this legal framework on the internal rate of return (IRR) of a problematic loan portfolio. Finally, in Section 5, we present some inferences regarding the consequences from the delays of implementing the collecting claims of receivables laws on Greek banks' NPL portfolios.

2. The legal framework of the collecting claims in Greece

Banks use various techniques to reduce or mitigate the credit risk of the granted loans. For example, a loan could be secured partially or entirely with cash or shares, with a guarantee from a third party or with oth-

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er financial products. Depending on the kind of credits provided by credit institutions, they are secured mainly by registered interests and personal securities. More analytically:

a) Pursuant to the Greek Civil Code (CC), mortgage (article 1257 et seq. CC) and pledge (article 1209 et seq. CC) are forms of collateral security, though mortgage prenotation (article 1274 et seq. CC), which constitutes a mortgage under condition, is of a significant practical importance. Mortgage, as well as mortgage prenotation, is entered on a real estate property owned by the debtor or a third person, who agrees to provide security for the debtor. Mortgage (or mortgage prenotation), which is entered on an industrial real estate property, includes machines, utensils and tools intended for it (articles 959, 1282, 1283 and 1306 no. 5 CC), irrespectively of whether they existed at the time of the entry of mortgage or were added later, with the condition that they belong to the owner of the real estate property. It must be noted, too, that, according to the specific Law no. 4112/1929, mortgage (and not mortgage prenotation) on an industrial real estate property includes machines, irrespectively of whether they belong to the owner of the real estate property in mortgage or not.

b) It is common in banking practice, and especially in credit agreements of open joint account, that every nominal claim of the debtor constitutes an object of a pledge against a third party, according to the articles 35 et seq. of the Legislative Decree 17.7/13.8.1923 "on special provisions concerning Sociétés Anonyme". In this case, the pledge on the claim results in the assignment of the latter to the creditor, who becomes the real and sole beneficiary of the claim, having thus the right to collect it (articles 39 and 44 of the abovementioned Legislative Decree). A more specific case of pledge on a claim is the pledge on a debtor's bank account or the pledge on mutual funds units, which both result in the assignment of the claim, too, due to the application of the abovementioned Legislative Decree. Pledge is also constituted on order titles, mainly on bills of exchange, checks and repositories of general warehouses, by being endorsed to the banks and delivered to the latter, according to the respective articles of the Greek Civil Code and the provisions of securities law. In the past, before the outbreak of the financial crisis, a large number of credit agreements of open joint account were secured by endorsements of order titles. In practice, the constitution of a pledge on shares of a corporation listed on a regulated market was common, too. There is also the notional pledge (pledge without delivery) of Law no. 2844/2000, in cases that businesses or self-employed persons are the debtors, as a more modern form of security which serves better its security purposes in comparison to the simple pledge, as the material delivery of the pledged is not required. It is mainly imposed on several professional equipments and goods.

c) In addition, personal securities include guarantees of partners, as well as of third persons in relation to the debtors, who, according to the terms of the respective agreements, are jointly and severally liable with the debtors, with their whole property, movable and immovable.

From the above brief analysis of the forms of securities for banks' claims, it is readily understood that the "selling" value of a loan depends on many factors, including the form of security that the bank has chosen for being secured, either prior to the granting of the loan or during later arrangements. It has to be noted herein that, practically, the value of a loan depends, mainly, on the securities on real estate property owned by the debtors and the guarantors, as pledges resulting in assignment of claims (namely pledges on bank accounts, mutual funds units etc.), have, in their majority, already been collected by the banks in their own effort to recover part of the non-performing loans. Additionally, the proceedings of a forced collection of old pledged checks and bills of exchange have almost been legally completed by the banks, without being significantly successful, due to the years-long growing financial crisis. The attempt of collecting invoices or other claims (future or not) that had been assigned to the banks by their debtors had the same conclusion. With respect to the pledge on shares, provisions concerning a simple pledge are applicable proportionally and, consequently, the proceedings of forced execution on movable property can take place, where more specific provisions concerning Sociétés Anonymes listed in a regulated market are applicable in special cases. As a result, forced execution regarding pledged shares takes place with the same proceedings, regarding time and cost, as the forced collection of claims secured by a simple pledge on movable property.

The ancillary rights of banks (in which collateral and personal securities are included) as well as all rights connected with them are assigned to loans and credit acquisition companies, with sale as a legal base, for the collection of the overdue debts, which is to be pursued either extrajudicially or in the context of the enforcement procedure provided. The majority of forms that these rights have leads –inevitably– to an approximate enlargement, as far as this article is concerned, of the time and cost required for the forced collection of a claim, as functions that affect the recovery of the total or part of the claims arising from bank loans and credits.

Prior to the forced selling of the claims, the proceedings provided by the Code of Conduct of Law no. 4224/2013 must be completed, in case that the latter had not been completed by the credit institution before the transfer of the claim (article 3 par. 2 sentence b of Law no. 4354/2015), unless the debtor has already been characterized as "non-cooperative". As part of the implementation of the Code of Conduct, claims management companies have the obligation to seek and find the best solution for the voluntary restructuring or rearranging of the debt. The total time that is required, though, for the completion of the proceedings provided by the Code of Conduct, depends, mainly, on the stage at which the proceedings were at the time of the transfer of the claim to the claims acquisition company; on whether the debtor is a legal entity or a person; on whether he is "cooperative" or not or, in this last case, on the stage at which he became "non-cooperative"; on whether the legal entity-debtor has an annual turnover not exceeding the amount of € 1,000,000, etc. For example, if the credit institution, prior to the transfer of the claim, had sent to the debtor only the first letter of formal notice, the total duration of the implementation of the proceedings provided by the Code of Conduct, when it is leading to an arrangement or final settlement solution with the cooperative debtor, is calculated, at the minimum, from three to six months, depending on whether the debtor is a person or a legal entity. However, negotiations for finding the best solution, provided that such a perspective exists, last, in particular cases, much longer, especially in cases of medium or large enterprises, where the Code of Conduct proceedings are not required to be exhausted in their formal part regarding letters of formal notice as well as the subsequent proceedings.

Legal actions for implementing the collecting receivables

If, however, the application of the Code of Conduct does not lead the parties to a debt settlement agreement or to the finding of a final settlement solution, then the company has to take legal actions for the forced collection of the claim. The first action, after the termination of a loan agreement, is to pursue of the award of the claim by the issuance of an order for payment, which is preferred in comparison to the lawsuit filed in the regular proceedings of the Greek Code of Civil Procedure, as, on the one hand, the order for payment constitutes an enforceable title and, on the other hand, its issuance has a cost lower than the lawsuit. To the extent that the lawsuit is filed only exceptionally, mainly when the claim cannot be proved by documents, we are going to refer herein only to the order for payment, indicating the possibilities that it offers as an enforceable title, as well as to the direct and indirect cost of it and of the ancillary actions based on it. It is furthermore noted that the provisions applicable to the orders for payment issued after January 1, 2016 are those of the new Law no. 4335/2016, while the orders for payment issued until December 31, 2015 are governed by the previous law.

According to the new provisions of the Greek Code of Civil Procedure (CCP), the judge of the country court is competent for the issuance of an order for payment, with respect to the claims of the county court jurisdiction, namely claims of an amount not exceeding € 20,000. With respect to any other claim of an amount exceeding € 20,000, the judge of the Single Member Court of First Instance (articles 14 and 625 CCP has jurisdiction). The territorial jurisdiction of a court determines, to a large extent, the time of the issuance of the order for payment, after the filling of the application for its issuance. In the Athens and Piraeus county court and Single Member court of First Instance, orders for payment are issued approximately after three months, while in provincial courts they can be issued within a few days. The expenses for the issuance of an order for payment are approximately up to a percentage of 8‰ of the amount of the claim, plus the remuneration of the lawyer, which, in this case and in all cases in general, depends on whether the lawyer is remunerated with a fixed periodic remuneration or as simply cooperating with the company. In this last case the respective remuneration constitutes an object of an agreement. The order for payment, in order to have a force of a *res judicata*, must be served twice, according to the detailed provisions of articles 630A and 633 of the Greek Code of Civil Procedure. The cost of each service of the order for payment to the debtor is, at a percentage of 80% approximately, up to € 35, plus VAT, plus € 35 for the submission of a copy of it to the competent court, concerning the first service.

Moreover, if the existing securities on a claim are not sufficient, the creditors, immediately after the issuance of the order for payment (and in most cases before the latter is served), enter, according to Article 724 of the Greek Code of Civil Procedure, mortgage notifications on real estate property of the debtor and the guarantors, with the condition that they find a security value in it. The legislative framework in force further provides for the possibility of the imposition of a conservative seizure in the hands of the debtor or of a third person. Suspension of the enforceability of the order for payment does not prevent, by an express provision of the law, such precautionary measures. The cost for the

entry of a conservative seizure, as well as for the entry of a mortgage prenotation amount, including VAT, is about 10‰ of the amount for which they are entered, including certificates, copies, etc. To this cost has to be added a small additional percentage for the remuneration of lawyers and for subsequent registrations of the entered seizures and prenotations to the offices under cadastre (where, of course, such registration is required).

The amendments of the Greek Code of Civil Procedure aimed at speeding up the proceedings of the forced execution, so that the latter is completed in a relatively reasonable time frame, in comparison to the lengthy and costly proceedings of the previous law. Additionally, with the amendments of the Code of Civil Procedure regarding creditors' classification, the aim of the legislation was the even partial satisfaction of all the creditors of the debtor. Thus, unprivileged claims (namely those not being secured with a pledge, mortgage or mortgage prenotation) are now classified as up to 10% of the amount of the auction product to be distributed to the creditors. Claims with a general privilege, when flowing together with claims being secured with a special privilege (pledge, mortgage or mortgage prenotation) are classified at 1/3 of the auction product, while the claims of the special privileged creditors are classified at 2/3 of it. However, if the claims of the special privileged creditors flow together with the claims of unsecured creditors and the claims secured with a general privilege, the first of the above claims (namely those secured with a special privilege) are classified as up to 65% of the auction product, the claims of unsecured creditors as up to 10% of the auction product and those with a general privilege as up to 25% of it. In order to avoid a case-by-case legal analysis, which goes beyond the scope of the present article, we are going to briefly mention the provisions of the Greek Code of Civil Procedure in force –after Law no. 4335/2015– concerning the enforcement of pecuniary claims.

In particular, after the service of the order for payment with an order for enforcement and with the condition that three days from this service have passed (article 926 par. 1 CCP), the main stages of the enforcement take place for the pecuniary satisfaction of the creditor, namely the seizure and the auction of movable and real estate property. Criterion for the application of either the previous law or the law in force after Law no. 4335/2015 is the time of the service of the order for enforcement. If the latter took place after January 1, 2016, the new Code of Civil Procedure is implemented, otherwise the previous law applies. The date of the forced auction is set not earlier than seven months from the date of the completion of the seizure and not later than eight months from it (article 954§2 e CCP). If, for any reason, the auction does not take place on the date set and in case that another creditor submits a declaration of continuation of the proceedings, then a new auction is set two months from the date of the declaration, but not after three months from it (article 973§1 CCP). It is noted that according to the provisions in force, the parallel procedure of many forced executions is possible, after the imposition of a seizure by more than one creditor, so that the completion of the first auction with the selling of movable or real estate property can take place.

The collecting receivables expenses

If other judicial actions do not take place, the expenses are about 10‰ of the amount of the claim for the forced seizure of real estate property and 1.5% for the auction. In these expenses, the remuneration of the bailiff for the service of the seizure report is included, as well as the remuneration for the drafting and publication of a summary of the seizure report, the registration of the seizure in the competent cadastral office, the expenditures for the valuer, for the announcement of the claim and for its service, the remuneration of the notary, etc. The expenses of the enforcement, if the auction product is sufficient, are removed and given to the person who expedites the enforcement before its distribution with the drafting of the creditors' classification board. It is noted, though, that after the entry into force of the provision of many seizures, the search for enforcement costs, which the creditor has paid but the enforcement has not taken place, is not allowed (article 997 par. 3 CCP). With respect to the seizure of movable property, the costs are significantly reduced, as the registration in a cadastral office (about 8‰ plus VAT) and expenses for a valuer (about € 600) are not required. However, the exact determination of the expenses and the time required for the forced collection of a claim is extremely difficult, due to many factors, such as the amount of the claim, the stage on which the claim was transferred to the acquisition company (if, for example, an order for payment has been issued or not, prior to the transfer of the claim), if the previous law or the law in force is the applicable one, the number of judicial proceedings already opened or to be opened in the debtor's defense against the order for payment and the proceedings of enforcement, the bankruptcy of the debtor, the death of a person, the dissolution of a company and its position in liquidation, etc. It is thus clear that, despite the considerably limited –in comparison to the past– time frame for the collection of claims arising from non-performing loans and the

reduction of the expenses due to the reduction of the judicial actions (for example, for the suspension of the enforcement in the first stage), the forced collection of claims is lagging in terms of time and cost with respect to the finding of an arrangement solution and mainly of a final settlement solution within the context of the Code of Conduct of Law no. 4224/2013 or in general in the context of an extrajudicial settlement. Such delay, as will be demonstrated below, may have negative impacts, regarding the final decision of companies acquiring liquid assets, on whether to invest in the systemic banks' NPLs.

3. The Basel II[1] & III regulatory framework on loans' collaterals

The collaterals which cover the credit expansion granted by banks to their customers are hedging techniques that reduce or transfer the credit risk. At the same time, they can create other risks, e.g., legal, operational, market or liquidity risk, etc. For this reason it is necessary for the banks to use unambiguous procedures and control methods of these types of risk. It should be noted here that any reduction of risk and mainly the credit risk confronted by banks, which grant loans to their customers, makes them safer. This consequently reduces the need for extra supervisory capital. The regulatory framework of Basel II & III imposes institutional, legal and general criteria, in order to oblige banks to reduce the credit risk with the use of the hedging techniques mentioned above (see, for example, the *Standardized* method and the *Internal Rating Based* method). In addition, the documents that are used (e.g., for contracts, concessions, etc.) should be fully binding for all parties and also legally robust. For this purpose, legal revisions should be also carried out regularly, on behalf of banks, to ensure the solvency of those documents. Additionally, the legal framework must guarantee, to the examined bank, that the financial collateral which is assigned or transferred, can be further sold off; if it is kept in the safekeeping of someone else, it must be ensured that this is separate from the other assets of the custodian. Finally, the value of the asset used as collateral against the issued loan is assumed to not be positively correlated with the credit quality of the counterparty.

Banks can proceed to the calculation of their credit risk, for loans they have granted, provided that attached financial collaterals are recognized by the Basel II and III mandates. Then, as a second step, they can proceed to the calculation of capital requirements, which will reduce their exposure against their counterparties.

The recognized financial guarantees, which can be used as collateral for the mitigation of the credit risk of the banks, officially are considered the following:

- Cash on deposit in a bank recorded as debt,
- Gold,
- Highly ranked debt titles recognized by an independent rating institute,
- Debt securities not recognized by an independent institute but only by the publishers (e.g., banks),
- Stocks (or bonds convertible into shares) included on a major stock index,
- Stocks (or bonds convertible into shares) which are not included on a major stock index but are traded in a recognized stock exchange,
- Shares/securities of collective investments Institute which invest in traded liquid values, similar to those mentioned above, which are recorded daily.

Then the banks can follow one of the two different methods for calculating the net and the weighted (after deduction of pre-appraised value of the collaterals) credit exposure, in order to disclose the anticipated bank's loss and the corresponding capital requirements. They can use either the *Standardized* or the *IRB-Internal Ratings Based* method.

The Standardized method

This method is separated into two different sub-methods: The *Simple* and the *Comprehensive* method (see BCBS, 2006).

In the *Simple* method, the computational approach of the attached weight of every issued loan for calculating the expected losses, and thus the capital requirements, is exogenous (according to the predetermined Tables provided by the Basel II & III). Additionally, the existence and type of financial guarantees (collaterals), which are attached to mitigate the banking assets, are important. Afterwards we have the replacement of the weighted credit factor of the counterparty with the weighted factor of the guarantee (collateral), for the portion of the loan which is covered by this. For example, for either a bank or corporate risk covered by some non-recognized financial guarantee to

1. The reference to the Basel II regulatory framework is because some mandates did not change in Basel III.

be realized, a loss of 45% (of the total amount of loan exposure) would be accepted. On the other hand, for a country or bank risk, the identifiable loss would reach 75% of the specific loan exposure.[2] The weighted factor cannot be less than 20% (with a few exceptions), while the portion of the loan which is not guaranteed (hedged), will take the weighted value of the counterparty. So, for example, in cases where the counterpart is either a State, a central bank, a public company, a commercial bank, a financial firm, an insurance company, a mutual fund, etc., the weighting factor will be 0%.[3] If, however, the counterpart is none of the above, then the smallest weighted factor applied would be 10% (see BCBS, 2006).

In the case of the *Comprehensive* method, the bank needs to calculate the adjusted exposure of the credit risk of the counterparty. Actually, this method uses specific coefficients of variation (haircuts)[4] in order to adjust both the loan and the corresponding collateral. This way we can incorporate, in the loan exposure of the bank, any possible future variations of the collaterals due to the changes of the market values.[5]

The IRB-Internal Ratings Based method (IRB)

In this method, the bank's loans portfolio can be initially classified into five (5) different categories, following different credit risk characteristics: for example, business claims, claims against States, claims against other banking institutions, claims against other retail banking requirements and, finally, claims against financial assets. Consequently, a specific value is assigned to the specific loan, creating thus the weighted asset (Weighed Risk Asset, RWA) which corresponds to the specific credit risk (e.g. loan) of the examined portfolio.

More analytically, this specific method can be divided into two (2) sub-approaches: The *Fundamental* and the *Advanced*.

These two separate approaches differ fundamentally in the way they calculate the weighted requirement (RWA) which corresponds to each banking claim (asset) and, consequently, to the analogous capital requirement.[6] More specifically, if you follow the *Fundamental* approach, the bank is allowed to use its own estimates for calculating the probability of default (*Probability of default-PD*) of its counterparty, but, additionally, is obligated to follow guidelines from external mechanisms, e.g., the monetary authorities, for the assessment of the other parameters (i.e., the parameters *EAD* and *LGD*)[7] which contribute to the determination of credit risk.

On the other hand, in the case of the *Advanced* approach, the bank can use its own estimates of all these parameters (i.e. parameters: *PD*, *EAD* and *LGD*)[8] that help in the formation of the weighted credit risk in order to calculate the corresponding capital charge/losses.

2. As it is reported in Panagopoulos & Vlamis (2009), in the case of mortgage NPLs, the weighted rating of the collateral would be 100%.

3. There is of course a wider range of weighted factors, concerning the counterparties of the bank's assets, which are analytically described in regulation 575/2013 of the European Parliament.

4. The coefficient of variation (*H*) is a factor which is adjusted to the collaterals of each loan based on the variability of its price (see Panagopoulos & Peletidis, 2007, p. 127).

5. A simple algebraic presentation of the bank loan exposure would be of the following form (see, BCBS [2006]):

$$E_i^f = max\left\{0, \left[E_i \times \left(1 + H_i^e\right) - Co \times \left(1 - H_i^{Co}\right)\right]\right\} \quad \text{(I)}$$

where: E_i^f is the bank exposure from a specific loan, E_i is the exposure of an asset (loan) before its mitigation by the collateral, Co is the amount of the financial guarantee for compensation, H^e is the variation coefficient (%, Haircut) of the specific bank's loan (if it exists) and finally, H^{Co} is the variation coefficient (%, Haircut) of the specific financial collateral for hedging purposes.

The E_i^f calculation allows us, subsequently, to find the expected losses of the bank, based on the following algebraic formula:

$$E_i^f(\text{amount}) \times RWA_i(\%) = RWA(\text{amount}) \quad \text{(II)}$$

This way we can calculate the bank's capital requirements for the specific loan exposure.

6. With this term we mean the algebraic calculation of capital requirements for the specific loan exposure of a bank. More analytically, we refer to the relationship: RWA (weighted loan amount) × 8% = Expected Loss (amount), in order to calculate the required capital needs for this specific bank's loan exposure.

7. More specifically, the expected loss in case of default on behalf of the counterparty (*Loss Given default-LGD*) and the exposure of the bank's asset in the case of a defaulting counterparty (*Exposure at default-EAD*).

8. The methods for estimating these parameters can be either econometric (e.g. either Logit/Probit approach) or some Value at Risk (VaR) approach.

In the section that follows, after the presentation of the Greek legal framework that incorporates the rules for the collecting claims on NPLs and the analysis of the regulatory framework of Basel II & III for the calculation of the capital needs of banks in case of expected loss, we proceed to the valuation of an NPL (typical) portfolio before its reselling to an investing company.

4. A model of the NPL portfolio's valuation

The decision of investing companies to purchase any NPLs from the systemic banks will basically depend on the IRR of this investment. For such calculation we seek out the discount rate which makes the sum of the cash outflows, which were spent in the acquisition of this portfolio of problematic loans and, subsequently, the expected net free cash flow generated by the investment, equal to zero. The "green light" for such an investment decision is usually given after comparing the realized IRR with the investors' expected yield. If the resulting IRR exceeds the investors' expected yield, then the investment can be considered as potentially profitable.

The parameters which play an important role in this type of investment and to a large extent determine the amount that will be offered by such investing companies for the acquisition of a NPL portfolio are analytically presented in the first column of Table 1a.[9] In the second column of this Table, some plausible values/percentages, based on the Greek reality, are set to these variables.[10]

TABLE 1a The basic factors for the calculation of the IRR of an entity that invests in the NPL bank portfolio

The assumptions of the model	
1. The degree of recoverability of the NPLs[11]	40%
2. NPL portfolio purchasing value (as a % of the nominal one)[12]	7%
3. Operating expenses (as a % of the entity's annual receipts)	30%
4. The duration of the NPLs portfolio receipts	120
5. Interest rate of loans*	8%
6.a The market portfolio return**	15%
6.b The expected return of the distressed fund's shareholder	2-3 times of the market portfolio return
6.c The required return of the NPL portfolio (2.5 × 15%)	37.0%

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

** We use the Equity Risk Premium calculated by Damodaran (2018) for Greece.

9. For an analytical presentation of each parameter of Table 1a, see Mouzoulas et al. (2017).

10. In our previous article (Mouzoulas et al., 2017, Vol. 32, *Greek Economic Outlook*), we extensively discussed the variability of those parameters that, according to our opinion, affect the expected yield (IRR) of an NPL portfolio investment.

11. No previous experience, on the recoverability of an NPL portfolio, in the Greek banking system exists. The 40% recoverability, of Table 1, was also implemented in our previous article of the *Greek Economic Outlook* (see Vol. 32, Table 1). This recoverability can of course be changed upward or downward (as a percentage), within the framework of an educational example, although this is not an issue of this article.

12. The specific percentage of the discount rate, concerning the NPL portfolio, is an average indicative percentage with and without collaterals (e.g. a mixed NPL portfolio). This percentage is decided after taking into consideration some specific variations of parameters which hypothetically affect the decision of an acquiring company to purchase the NPL portfolio. In a very recent buy-out of an NPL portfolio with collateral property (Piraeus Bank, 30/5/2018), the discount rate reached about 20.0%. In another recent case without collateral (Alpha Bank, 13/3/2018), the discount rate of the nominal value of the NPL portfolio was much lower (2.40%). Finally, it is necessary to mention here that the average discount rate of Table 1 was also used in our previous article (see *Greek Economic Outlook*, vol. 32, Table 1).

TABLE 1b The IRR calculation of an entity that invests in bank NPLs

The IRR calculation

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

In Table 1b, the numerical calculation of the IRR, on the basis of the assumptions in Table 1a, is presented. Additionally, taking into consideration the realities of the Greek tax system, we set a tax corporate rate on revenues (net of operating expenses) equal to 29%.

Based on the initial assumptions, the numerical result concerning the IRR of an NPL portfolio is about 38.4%. In addition, for a better understanding of the other parameters in Table 1b, we provide the following explanations:

a) The price of this NPL portfolio buyout is only a percentage of its initial nominal value. Assuming that this nominal value is € 1 billion, the acquiring value of € 70 million makes the discount rate equal to 7%. This amount of money would be spent at year 0, and for the subsequent years (1-10), it is assumed that the investing company would generate some positive free cash flows, as described in the last row of Table 1b,

b) The annual revenues, from the principal and the interest rates, are the sum of installments of the 50% of the amounts recovered, as initially described in the postscript of Table 1a. The cash inflows from these regulated loans would correspond to an average interest rate of 8%,

c) The remaining 50% of annual revenues from NPLs will come from disposals of (real) assets. In addition, we follow the assumption that the amount of recoveries would come out by implementing methods of compelled collective receivables which would be produced in the early years of the investment in NPLs and would decline progressively,

d) The operating expenses are considered to be 30% of the annual revenues. This hypothesis was highlighted in the assumptions of Table 1a,

e) The free cash flow results after the deduction of operating expenses and the income taxes from the total revenues,

Under the aforementioned assumptions, it is estimated that the IRR of our example would be around 38.43%. This result is fundamentally the percentage that makes the net present value of the cash flows, of the last row of Table 1b, equal to zero.

Based on the regulatory framework discussed in Section 2, special attention is next attributed to the legal procedures of the compelled collective receivables and to the (time) efficiency of this mechanism. Two (2) parameters/variables, which were analytically presented in Table 1a, are expected to be seriously affected from this: the degree of revocability of the NPL portfolio and the operating expenses. Any variation of these two parameters, as we will demonstrate below, is expected to affect the percentage of the IRR of the NPL portfolio.

However, for a better understanding of the IRR behavior of the NPL portfolio, we will initially implement a mathematical model of net present values as indicated in the next section.

The model of time and cash collecting flows

The implemented mathematical model is in accordance with the assumptions of Table 1a for the computation of the IRR of an NPL portfolio. In brief, the calculation of the net present values (NPV) of such an investment will have the following algebraic form:

$$NPV = -IINV + \frac{C_1}{(1+r)} + \frac{C_2}{(1+r)^2} + \ldots + \frac{C_n}{(1+r)^n} \qquad (1)$$

where:

NPV is the net present value of the investment,

IINV is the initial cash investment outflow,

C_t is the expected cash inflow of the year *i* (with values from 1 to *n*),

n is the duration of the investment in years,

r is the discount rate.

For reasons of simplifying the mathematical calculations, we assume that an investment is composed of an initial cash outflow that only renders once at the end of the time duration, which is the year *t*. In this case, the equation (1) is simplified to the following form:

$$NPV = -IINV + \frac{C_t}{(1+r)^t} \qquad (2)$$

Because the IRR is the discount rate which makes the (aforementioned) net present value equal to zero, equation (2) can subsequently be transformed as:

$$0 = -IINV + \frac{C_t}{(1+IRR)^t} \qquad (3)$$

Then equation (3), with the appropriate mathematical transformations, can next take the following algebraic form:

$$IRR = \left[\frac{C_t}{IINV}\right]^{\frac{1}{t}} - 1 \qquad (4)$$

The aforementioned equation (4) implies that the realized IRR of a hypothetical NPL portfolio clearly depends on the initial amount of the cash investment outflow (IINV). Thus, the larger (smaller) the initial investing amount is, the smaller (larger) the IRR will turn out to be. It also depends on two additional factors:

- The size of the single cash inflow (C_t) that will happen in year *t*. According to our initial assumptions, the two parameters –the cash inflow and the expected yield– are expected to move accordingly, i.e. the larger (smaller) the amount of the initial cash inflow the larger (smaller) the corresponding IRR. Overall, whatever positively or negatively affects the cash inflows of an investment also affects the derived IRR and, therefore, makes it more or less efficient,
- The time (*t*). The IRR is inversely related to the time (*t*) receiving the unique (in this example) cash inflow of (C_t). In general, what emerges from the simplistic example of equation (4), is that the more we (time) extend the cash inflows of an investment, the more its IRR diminishes and, conversely, the faster these cash inflows "render" the higher the expected yield (IRR).

The extension of the aforementioned model in many time periods, in order to highlight the impact of the IRR determinants/factors, requires more complex calculations. This, however, goes beyond the main purpose of our article, although we believe that the results will be rather similar. The implementation of the above simplified mathematical model helps to effectively draw some interesting conclusions, which is our main objective here.

Following now a *Sensitivity analysis*, based on the initial numerical results derived from the simplified mathematical cash flow model (see Table 1b), we can next demonstrate how the Greek legal framework of the collective claim receivables upon problematic loans can influence both the direct and/or the indirect costs[13] of an NPL portfolio investment.

Sensitivity analysis of the model

Initially, we begin from the direct costs. These (costs) are classified in the general category of the operating expenses. Thus, the higher they are, the smaller the remaining net cash inflows. As explained in the initial description of the simplified mathematical model, the IRR changes in the same direction with the inflows. Thus, the smaller they are (e.g. higher direct costs, smaller realized inflows), the lower the excepted yield of the NPL portfolio will be. In Table 2 we present the change of the IRR relative to the operating costs as a percentage of the gross annual revenues.

13. More specifically, either through the impact on operating costs (direct costs) or through the impact on the time deferred revenues from disposals of assets.

TABLE 2 The impact of the variability of operating expenses for the IRR of the NPL portfolio[14]

Operating costs (as % of the annual revenues)	Internal rate of return (IRR, %)
25%	41.71%
26%	41.06%
27%	40.40%
28%	39.75%
29%	39.09%
30%	38.43%
31%	37.77%
32%	37.10%
33%	36.44%
34%	35.77%
35%	35.10%
36%	34.42%
37%	33.75%

From the results of Table 2 we can easily see that any increase (%) of the operating expenses (of Table 1b), will lead to the reduction of the expected yield (IRR) of the NPL portfolio.

Before we proceed to the discussion regarding the time-deferred revenues from assets disposals, we should discuss the significance of the way the time factor (t) affects the expected yield (IRR) of an NPL portfolio. For this purpose Table 1b should become more analytical, and then we can proceed to the presentation of Table 3. Thus, Table 2 is derived from the assumptions provided in Table 1a with some additional explanations presented below:

a) Gross revenues from assets disposals: The amount of money for all examined years is actually equal to 50% of the amount that is expected to be recovered (initially assumed as 40% of the nominal value of the NPL portfolio). These amounts of revenues are calculated accepting the basic assumption that "in due time" the earning from the disposals of assets would turn out diminishing.

b) The annual net revenues from asset disposals result from the gross revenues of those disposals after the reduction of the relevant operating expenses (as a ratio of the gross revenues of the assets disposals over the total revenues). The same applies for the net revenues from the problematic loans arrangements, which are expected to remain constant during the examined years.

c) The time of revenues' collection from assets disposals is important. More analytically, they are under some kind of time deferment in order to reveal how the time extension of these particular revenues affects the investment's expected yield (IRR). The degree of time differentiation, in our example, is measured as a percentage of the year's duration, e.g., a 70% time differentiation of receiving these revenues signifies that they will be at 256 days of delay rather than originally assumed (i.e. algebraically: 70% × 365 days of the year). The discounted revenues from asset disposals also embody the degree of their time differentiation. Note that the time of the investment remains unchanged in 10 years.

d) The discounted revenues from problematic loans arrangements are assumed to be collected on regular time intervals, of the investment period, without any kind of time rescheduling.

In Table 4, several time-deferred rates of revenues described in Table 3 are tested, in order to examine the degree/speed which the expected yield (IRR) of the NPL portfolio is reduced.

Finally, we should recall here that in our example we assume that half of the total revenues of this NPL investment would come from the disposals of the collaterals. If the revenues of this category are the largest percentage of total revenues (e.g. over 50% than initially assumed), then its contribution to the IRR synthesis will obviously be greater than expected. This, however, implies that we would have a (potentially) non-efficient performance of the NPL investment. Alternatively speaking, the more time-consuming this process of collecting revenues from compelling claim receivables is, on behalf of the investment companies, the bigger the discount of the NPL portfolio will be, with respect its nominal value, making the selling from the corresponding bank relatively low-priced (cheap).

14. The results of Table 2 were obtained by the application of the *sensitivity analysis* on the results of Table 1b. More analytically, it is the application of a TABLE "function"; in an *Excel* form, where the operating costs over revenues is used as an independent variable and the internal rate of return (IRR) as a dependent one.

TABLE 3 Analytical revenues, by category, from investing in an NPL portfolio*

Years	0	1	2	3	4	5	6	7	8	9	10
Gross revenues from assets disposals		24	34	40	30	22	20	14	10	6	0
Percentage (%) of revenues from assets disposals on gross revenues		45%	54%	58%	51%	43%	41%	32%	26%	17%	0%
Annual net revenues from assets disposals		11.93	16.90	19.88	14.91	10.93	9.94	6.96	4.97	2.98	0.00
Annual net revenues from rearrangements		14.47	14.47	14.47	14.47	14.47	14.47	14.47	14.47	14.47	14.47
Recovery time for revenues from assets disposals (including time-deferred ones)		1.7	2.7	3.7	4.7	5.7	6.7	7.7	8.7	9.7	10.0
Percentage (%) of time-deferred revenues from assets disposals		70%									
Discounted revenues from assets disposals		7.23	7.63	6.68	3.73	2.04	1.38	0.72	0.38	0.17	0.00
Discounted revenues from loans re-arrangements		10.78	8.03	5.98	4.45	3.32	2.47	1.84	1.37	1.02	0.76
Net discounted total cash flow revenues. Years, 0-10	-70	18.01	15.66	12.67	8.19	5.36	3.85	2.56	1.75	1.19	0.76

* In this Table we calculate and present the cash flows from the different categories of revenues.

TABLE 4 The effects of time-deferred rates of revenues from loan rearrangements* on the IRR performance of an indicative NPL portfolio[15]

Degree of time-deferred revenues from assets disposals	Internal rate of return (IRR,%)
5%	38.07%
10%	37.72%
15%	37.39%
20%	37.06%
30%	36.44%
40%	35.85%
50%	35.29%
60%	34.76%
70%	34.25%
80%	33.77%
90%	33.32%
100%	32.88%

* Due to the malfunctions of the legal mechanism related to the collecting receivables.

5. Conclusions

The purpose of this article is twofold: first, to briefly present the issues that arose from the Greek legal framework on the claims of collective receivables (from NPLs) and, second, to reveal the consequences emerging from this legal framework to the expected yield (IRR) of such problematic loan portfolios through the implementation of an algebraic example.

But as it is understood from the aforementioned illustrative example, any delay of assets disposals, which essentially manifests itself in the form of deferred revenues, affects incrementally the anticipated IRR of an investment in NPLs. However, this could have a negative impact on the discount value (rate) of the NPL portfolio. Additionally, we should underline that although the anticipated IRR, for a problematic loan portfolio (NPL) we examined here, is regarded as rather high, we should not ignore the fact that NPLs comprise 45% of the Greek banking system's total loan portfolio. This percentage of NPLs is considered as "very high", especially if it is compared with the average Eurozone level which does not exceed 6-7% (see KPMG, 2017).

15. The Table 4 results are derived from the discounted free cash flow from an NPL portfolio investment using various time deferred revenues of assets disposals (see Table 3). Then, for every such group of cash flows we calculate the IRR, provided that their net present value will be equal to zero, if it were reimbursed with a (interest) rate that would equal to that return.

All these issues should consequently be taken into serious consideration by everyone who is involved with the sales of problematic loans. Finally, although there are social and political issues associated in principal with real estate auctions, at the same time we should not ignore that any more delay in resealing those problematic loans may lead to further negative effects on their discount value (rate), which potentially can lead to a re-capitalization of the systemic banks' equity.

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E-commerce and Information and Communication Technologies in Greek firms

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Abstract

In this article we explore the evolution and potential determinants of the adoption of Information and Communication Technologies (ICT) and e-commerce by Greek firms. Utilizing data from the annual surveys on the "Use of Information, Communication and Electronic Commerce Technologies" undertaken by the Hellenic Statistical Authority (ELSTAT) for the 2008-2016 period, we examine the evolution of key indicators of ICT and e-commerce (use of personal computers-PCs, internet access, website availability, reception of electronic orders) over time. In addition, with the use of econometric analysis we investigate the role of ICT infrastructure, human capital and firm characteristics (size, industry, location) in e-commerce adoption and we identify factors that may hinder firms' e-sales. According to our findings the vast majority of Greek firms use PCs and have internet access; however, the dissemination of e-commerce appears to be still rather limited. Econometric results show that investments in infrastructure and human capital appear to be particularly important for e-commerce adoption. Also, small firms, firms belonging to trade and services sectors, as well as enterprises located in the Greek periphery seem to have an increased probability of being engaged in e-commerce activities.

Keywords: *e-commerce, Information and Communication Technologies (ICT), barriers to e-commerce*

1. Introduction

Information and Communication Technologies (ICT) have changed, in a radical way, the majority of business activities, creating huge opportunities and multiple benefits for enterprises at the regional, national and international level. From a business perspective, the gains of integrating and using ICT refer to cost savings, organizational effectiveness, improvement of services to customers and suppliers, and access to new business opportunities and market information; these gains are usually translated in terms of innovation, productivity, competitiveness and growth (Arvanitis, 2005; Ghobakhloo et al., 2011; Tan et al. 2010).

More specifically, e-commerce, as a form of ICT application, can significantly improve firms' efficiency in their daily activities and transactions, increase information flows and open new cross-border distribution channels, which can contribute to firms' internationalization (Ongori and Migiro, 2010). On the other hand, as in the case of general purpose technologies, integrating and using e-commerce technologies entails a series of adaptation costs (e.g., employee training, licensing, organizational restructuring and upgrading existing facilities). These costs need to be taken into consideration, especially in the case of SMEs, which face increased constraints with respect to financial capital as well as human and other resources (Ghobakhloo et al., 2011; Tan et al., 2010).

The issue of ICT adoption has attracted much attention in the international literature, with a significant number of studies undertaking survey-based research considering firms of different sizes, industries and/or countries, as well as different technology types (Bayo-Moriones and Lera-López, 2007; Fabiani et al., 2005; Kurnia et al., 2015; Hollenstein, 2004; Dholakia and Kshetri, 2004). In Greece, the relevant studies are rather limited. Particularly, Spanos et al. (2002), using survey data from 91 leading companies with an average firm size of 515 employees, identify significant relationships between ICT adoption and some changes in strategy, organizational structure, management systems and human capital skills. Moreover, Papastathopoulos and Beneki (2010), using survey data for 54 Greek SMEs, show the existence of a statistically significant relationship between ICT investments and both ICT-organizational forms and ICT strategy. Chatzoglou et al. (2010), also based on survey data from 278 employees in Greek SMEs, ex-

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– Opinions or value judgments expressed in this article are the authors' own and do not necessarily reflect those of the Centre of Planning and Economic Research.

amine personal computer acceptance patterns using a structural equation model.

In addition, the results from logistic regressions for 100 Greek SMEs participating in a questionnaire-based survey undertaken by Pontikakis et al. (2006) highlight the role of previous experience in the adoption of internet-enabled personal computers. Finally, very recently, Giotopoulos et al. (2017) utilize data from a large-scale survey on 3,500 Greek SMEs to explore the role of firms' technological competencies, human capital of workforce and internal organization in ICT adoption. Econometric analysis shows that innovation and R&D activities and collaborations, well-educated and skilled workers, decentralized decision-making and visionary leadership increase the likelihood of adopting new technologies in SMEs.

The present article contributes to the literature related to ICT and, more specifically, e-commerce adoption using and analyzing data from a large sample of Greek firms. The Greek case appears to be of interest due to the adverse economic conditions that businesses have faced during at least the last 8 years and also due to the limited exploitation by firms of opportunities and possibilities arising from the new technologies. In this respect, Europe's Digital Progress Report (EDPR) for the year 2017 (European Commission, 2017) once again classifies Greece in the group of countries with low performance, along with Romania, Bulgaria, Italy, Croatia, Poland, Cyprus, Hungary and Slovakia.

Given the above, many scholars and policy makers highlight the significant role that new technologies can perform in Greece, on its way to rebalancing and economic recovery (Giotopoulos et al., 2017; Kontolaimou, 2015). In this context, we examine the development of key indicators of ICT and e-commerce over time, and we also explore the role of ICT infrastructure, human capital and firm characteristics (size, industry, location) in e-commerce adoption by Greek firms with the use of econometric analysis. In addition, we identify factors that may hinder the implementation of such technologies, operating as significant barriers to firms' e-sales in Greece.

The article is structured as follows: Section 2 presents the evolution of basic indicators of ICT and e-commerce adoption over time. Section 3 describes the data, the variables and the econometric model used. Estimation results are presented and discussed in Section 4. The last section concludes and provides some relevant policy implications.

2. Evolution of ICT and e-commerce adoption by Greek firms

The data used to capture the evolution of ICT and e-commerce adoption over time, as well as to conduct the econometric analysis, are derived from the survey "Use of Information, Communication and Electronic Commerce Technologies (ICT)", which is carried out by ELSTAT on an annual basis. It should be noted that the questionnaires sent by ELSTAT to firms vary each year, with only a certain number of questions being common to all the years under investigation. Moreover, the survey is addressed to firms with at least 10 employees; therefore the sample does not include micro enterprises.

As far as the adoption of ICT by Greek firms is concerned, three key factors are examined: computer usage, internet access and the existence of a company's home page or website. The data are derived from the annual surveys that took place during the period 2008-2016. Regarding e-commerce adoption, it is examined whether the company received orders for products or services through a website or specific applications (apps) during the previous year of the survey.[1]

Table 1 presents the number of firms that responded to the ELSTAT survey, as well as the number and percentage of companies that use PCs. The percentage of firms using PCs ranges between 93% and 97% during the period 2008-2016. It is noteworthy, that the low-

TABLE 1 Number and percentage of firms using PCs

Year	No of firms	No of firms using PCs	% of firms using PCs
2008	1,906	1,855	97%
2009	2,981	2,858	96%
2010	3,123	3,019	97%
2011	2,547	2,480	97%
2012	2,080	2,003	96%
2013	3,100	2,942	95%
2014	3,295	3,128	95%
2015	2,654	2,472	93%
2016	3,010	2,820	94%

1. Manually typed e-mails are excluded.

TABLE 2 Percentage of firms that use PCs and have access to the Internet, have a website and receive electronic orders (e-commerce)

Year	Internet	Website	E-commerce
2008	98%	73%	10%
2009	97%	71%	9%
2010	99%	72%	12%
2011	99%	78%	11%
2012	99%	75%	10%
2013	98%	76%	12%
2014	99%	77%	12%
2015	99%	79%	9%
2016	99%	81%	12%

est percentages, 93% and 94%, are observed in the last two years of the period under examination; that is in 2015 and 2016, respectively.

Almost all firms using PCs have access to the Internet during the period 2008-2016, as shown in Table 2. This percentage ranges from 97% to 99%, and since 2010 it has remained stable at 99%, with the sole exception of 2013. In addition, a large percentage of firms using PCs also have a website or a homepage (Table 2). This percentage ranges from 71% to 81%. It should be noted, that the average percentage of firms using PCs and having a website is 74% for the sub-period 2008-2012, while the corresponding average, for the sub-period 2013-2016, is 78%. Therefore, there seems to be an increasing trend in the number of companies that have a website.

The percentage of firms using PCs and having received electronic orders appears to be relatively stable over the period under consideration, ranging between 9% and 12%, as shown in Table 2. Considering the average percentage of firms that received electronic orders during the two sub-periods, 2008-2012 and 2013-2016, we observe that it remains stable at 11%. Therefore, there seems to be no clear trend of increase or decrease, as far as the adoption of e-commerce is concerned, during the period under examination.

3. Data, variables and the econometric model

The econometric analysis makes use of data on 5,664 firms that participated in the most recent surveys of ELSTAT for years 2015 and 2016, which were available at the time of our research.[2] The analysis is based on these two years to consider the most recently available data and also to take advantage of the similarity of the questionnaires used (many common questions) in the respective surveys.

Table 3 presents firm distribution in our sample per size, sector and location. Firms are classified in three size groups, namely small, medium and large, according to the EU respective definitions. As already mentioned, the specific ELSTAT surveys address enterprises with at least 10 employees. Also, firms of our sample are classified in four sectors, i.e. manufacturing; services; retail and whole trade; energy and construction, based on the European Commission's NACE classification of economic activities.

As shown in Table 3, the majority of the examined firms are small (62%) and operate in the services (38%) and manufacturing (33%) sectors. Moreover, regarding regional distribution, almost half of the firms under study appear to have their base in the region of Attica, while the region of Central Macedonia follows with a percentage of 14.5%. The remaining Greek regions exhibit one-digit percentages, implying the significant concentration rate of firms in the largest urban centers of the country (Athens and Thessaloniki). Generally, we can argue that the firm distribution reported in Table 3 reflects to a large extent, the structural and demographic attributes of the Greek economic activity.

Based on related international literature (Haller and Siedschlag, 2011; Taylor and Murphy, 2004), we define the dependent variable of electronic sales in our model as follows:

Electronic sales (Esales): The firm reports whether it received orders for products/services via website or special applications ('apps') during the year preceding the survey. It is a binary (0/1) variable taking the value of 1 in case of a positive answer, and 0 otherwise.

The independent (explanatory) variables we use refer to ICT infrastructure, human capital, firm size, sector of economic activity and firm location. Related studies have systematically investigated and emphasized the role of human capital (Fabiani et al., 2005; Lucchetti and Sterlacchini, 2004; Martins and Oliveira, 2008), as

2. Firm coding in the specific ELSTAT surveys does not allow the identification of common firms across the surveys; as a result, the construction of a panel dataset taking into account the time dimension was not possible.

TABLE 3 Firm distribution per size, sector and location

	Number of firms	Percentage (%)
Size		
Small (<50 employees)	3,514	62.04
Medium (50-249 employees)	1,528	26.98
Large (250 or more employees)	622	10.98
Sector		
Manufacturing	1,892	33.40
Retail & whole trade,	1,163	20.53
Services	2,172	38.35
Energy and construction	437	7.72
Location		
Attica region	2,822	49.82
Central Macedonia	825	14.57
Rest of Greece	2,017	35.61
Total	5,664	100

well as demographic factors (Tan et al., 2010; Dholakia and Kshetri, 2004; Bayo-Moriones and Lera-López, 2007) in ICT adoption. In addition, following existing empirical studies (Hollenstein, 2004; Ghobakhloo et al., 2011), we include in our model a set of variables to capture potential obstacles that firms face in receiving and executing client electronic orders. More specifically, we examine the following variables:

Employees with internet access (Interempl): The firm reports the number of employees who used PCs with internet access in the context of their work during the year preceding the survey. It is a continuous variable expressed in a natural logarithmic form.

Website availability (Website): The firm reports whether it has a website. It is a binary (0/1) variable taking the value of 1 in case of a positive answer, and 0 otherwise.

Training ICT specialists (Training): The firm is asked whether it provided training to ICT specialists to develop/upgrade their ICT skills during the year preceding the survey. It is a binary (0/1) variable taking the value of 1 in case of a positive answer, and 0 otherwise.

Regarding barriers to electronic sales, enterprises that participated in the survey were asked to note in a given list all factors that constrained or hindered e-sales via website or 'apps' during the year preceding the survey. Based on firms' answers we constructed the following binary variables:

Unsuitability of products/services (Products): It takes the value of 1 in the case where the firm considers its goods or services not suitable for sales via website, and 0 otherwise.

High cost (Cost): It takes the value of 1 in the case where the firm considers the costs of introducing web sales too high compared to the benefits, and 0 otherwise.

Problems related to payments (Payment): It takes the value of 1 in the case where the firm notes problems related to payments as a barrier to web sales, and 0 otherwise.

Problems related to ICT security or data protection (Security): It takes the value of 1 in the case where the firm notes problems related to ICT security or data protection as a barrier to web sales, and 0 otherwise.

Problems related to the legal framework (Legal): It takes the value of 1 in the case where the firm notes problems related to the legal framework as a barrier to web sales, and 0 otherwise.

To account for firm size, we included in our model two dummies, i.e. *medium* and *large* (as defined above), considering small firms as the reference group. Also, we included sector dummies which show whether the enterprise operates in *trade*, *services* or *energy and construction*, defining manufacturing as the reference category in the econometric analysis. Finally, we took into account firm location, that is whether the enter-

prise is based in a highly urbanized region, by creating a binary variable (*location*) which takes the value of 1 in the case where the firm reports the region of Attica or Central Macedonia as its base, and 0 otherwise.

Given the above, the model to be estimated can be written as:

$$\begin{aligned} Esales_i = {} & b_1 Inerempl_i + b_2 Website_i + \\ & + b_3 Training_i + b_4 Products_i + b_5 Cost_i + \\ & + b_6 Payment_i + b_7 Security_i + b_8 Legal_i + \\ & + b_9 Location_i + \boldsymbol{kS}_i + \boldsymbol{rI}_i + u_i \end{aligned} \quad (1)$$

where the dependent variable $Esales_i$ stands for the electronic sales of firm *i*. The explanatory variables $Inerempl_i$, $Website_i$, $Training_i$ and $Location_i$ denote employees with internet access, website availability, training provided to ICT specialists and location of firm *i*, respectively. $Products_i$, $Cost_i$, $Payment_i$, $Security_i$ and $Legal_i$ refer to the barriers to e-sales reported by firm *i*, namely unsuitability of products/services, the high cost, payment problems, ICT security problems and legal framework problems, respectively. Vectors $\boldsymbol{S}_i$ and $\boldsymbol{I}_i$ represent size and industry (sector) dummies, respectively. Finally, u_i is the error term for firm *i* and ***b, k*** and ***r*** denote the vectors of coefficients to be estimated.

As described above, the dependent variable $Esales_i$ is a binary (dichotomous) variable, i.e:

$$Esales_i = y = \begin{cases} 1, & \text{if the firm receives client orders via website or 'apps'} \\ 0, & \text{if the firm does not receive client orders via website or 'apps' 'apps'.} \end{cases}$$

In the case of dichotomous dependent variables the analysis undertaken concerns primarily the probability:

$$p(\boldsymbol{x}) = P\,(y = 1|\boldsymbol{x})$$

where $\boldsymbol{x}$ denotes the vector of the explanatory variables. We can use a function *F* (usually called a link function) to express our model, i.e.

$$P(y = 1|\boldsymbol{x}) = F(\boldsymbol{xb} + u). \quad (2)$$

assuming that $0 < F(\boldsymbol{z}) < 1$, for all real values $\boldsymbol{z}$.

Equation (2) is a general formulation which can accommodate both Probit and Logit models which are used to estimate equation (1). The Probit model uses the standard normal distribution for the specification of *F*, while the Logit model uses a standard logistic distribution. Both models are estimated using the maximum likelihood estimation method. In non-linear models, like Probit and Logit, the estimated coefficients are not interpreted in the same way as in the case of linear regression models. The estimators in these models inform us about the statistical significance of each variable, but not about the size or magnitude of the relevant effect. Thus, for comparison and interpretation reasons we also estimated the average marginal effects of the variables of interest on the probability $p(\boldsymbol{x}) = P\,(y = 1|\boldsymbol{x})$.

4. Econometric analysis results

Table 4 presents the estimation results for the Probit and Logit models, as described above, referring to the factors that may affect the probability of realizing electronic sales. Notably, as can be deduced from Table 1, 372 enterprises that participated in both 2015 and 2016 surveys reported that they do not use PCs and, thus, did not proceed to the next sections of the questionnaire. In order to check for the existence of sample selection bias due to the exclusion of the specific observations from the analysis, we performed a two-stage regression based on the Heckman model (Heckman, 1979). The appropriate test in this setting showed that our estimations are not biased due to sample selection.[3]

As shown in Table 4, results from the two models are largely in agreement, with marginal effects in the Probit models being, in most cases, larger than the corresponding ones in the Logit model. We can say that both models perform rather well (based on the value of Pseudo-R^2 and the likelihood ratio-LR test), with model (2) exhibiting slightly higher goodness of fit (higher pseudo-R^2).

In general, the results highlight the significance of ICT infrastructure and human capital for e-commerce adoption by the examined Greek enterprises. More specifically, we found that the higher the number of employees with internet access, the higher the probability of realizing e-sales. Accordingly, the significant marginal effects (in terms of both size and statistical significance) of *website availability* in both models indicate that firms with a website have an increased prob-

3. We first estimated a selection model with the *use of PCs* (yes/no variable) as a dependent variable and then our basic model with *Esale* as a dependent variable according to equation (1). The hypothesis of uncorrelated error terms between the two models could not be rejected ($X^2 = 1.55$, p-value = 0.21), indicating the absence of sample selection bias in our estimations.

TABLE 4 E-commerce determinants

	Probit model (1)	Logit model (2)
Employees with internet access	0.017***	0.012***
	(0.003)	(0.002)
Website availability	0.130***	0.114***
	(0.012)	(0.012)
Training ICT specialists	0.015**	0.012**
	(0.007)	(0.005)
Unsuitability of products/services	-0.115***	-0.093***
	(0.008)	(0.007)
High cost	-0.064***	-0.056***
	(0.008)	(0.007)
Problems related to payments	-0.034***	-0.032***
	(0.007)	(0.006)
Problems related to ICT security or data protection	-0.010	-0.011
	(0.009)	(0.007)
Problems related to the legal framework	-0.028***	-0.028***
	(0.009)	(0.007)
Medium	-0.018**	-0.013**
	(0.008)	(0.006)
Large	-0.027**	-0.018*
	(0.012)	(0.009)
Trade	0.057***	0.043***
	(0.008)	(0.007)
Services	0.053***	0.042***
	(0.007)	(0.006)
Energy and construction	-0.030*	-0.027*
	(0.018)	(0.016)
Location	-0.016**	-0.012**
	(0.007)	(0.005)
Likelihood function	-1403.578	-1383.301
LR test (X^2)	809.16***	849.72***
Pseudo-R^2	0.224	0.235
Number of observations	5,218	5,218

Notes: Average marginal effects are presented; standard errors in parentheses;

* Statistically significant at the 10% significance level, ** Statistically significant at the 5% significance level, *** Statistically significant at the 1% significance level.

ability of e-commerce adoption (compared to those lacking a website). In addition, the estimated marginal effects corresponding to *training ICT specialists* imply that enterprises which invest in human capital by training employees specializing in ICTs are more likely to be engaged in e-commerce activities than those who do not.

Focusing on barriers to e-commerce, the results suggest that all examined factors impede firms' e-sales (negative and statistically significant corresponding marginal effects) with the exception of *problems related to ICT security or data protection* which were found to have a negative but not statistically significant impact. More specifically, according to our findings, unsuitability of firms' products/services for e-sales (based on firms' perceptions), the high cost of implementation and use of e-commerce technologies compared to the benefits, problems related to payments and the legal framework seem to decrease the probability of e-commerce adoption by Greek firms.

Moreover, the results referring to firm characteristics present particular interest. Regarding firm size, the

negative marginal effects of the size dummies show that medium-sized and large enterprises are less likely to realize e-sales in comparison to small firms (reference group). This finding may seem unexpected given the financial and other constraints that smaller firms usually encounter, making ICT and e-commerce adoption more difficult than for larger firms. However, a possible explanation could be provided on the basis of small firms' greater flexibility (relative to the larger ones) and the need to acquire a competitive advantage towards larger enterprises in order to survive. On the other hand, it must be noted that this result is consistent with existing empirical evidence from other countries on the existence of a negative relationship between firm size and ICT adoption (Bayo-Moriones and Lera-López, 2007; Dewett and Jones, 2001; Harris and Katz, 1991).

Focusing on the regional dimension, our estimations suggest that firms which operate either in the trade or the services sector have an increased probability of adopting e-commerce practices in comparison with manufacturing firms (reference group). Finally, the result regarding firm location appears to be of interest as well. In particular, the negative and statistically significant marginal effect of *location* on the dependent variable implies that firms located in the regions of Attica and Central Macedonia have decreased likelihood of engaging in e-commerce activities compared to firms in the rest of Greece. This finding potentially shows that firms of the Greek periphery that are located in relatively remote and difficult to reach areas, with a low urbanization degree (e.g. island regions), are more prone to the adoption of e-commerce practices since this could be a way to access more markets (domestic and international) and increase their competitiveness, given the adverse economic conditions in Greece during the last years. Moreover, the relatively large number of firms which operate in the tourism sector in these areas may also play a relevant role.

5. Conclusions

The digital transformation of the global production/business model has a significant economic impact. Digital entrepreneurship and e-commerce are identified as key drivers of productivity, employment, competitiveness and growth. Even though e-commerce is gaining ground internationally, Greece falls behind the majority of other EU member states. Therefore, the more extensive and rapid adoption of ICT by the Greek firms is of great importance, in order to take advantage of the opportunities that arise from the new technologies and e-commerce.

In this context, this article explores the evolution and the possible determinants of the adoption of ICT and in particular of e-commerce by Greek companies. Using data from the annual survey "Use of Information, Communication and Electronic Commerce Technologies (ICT)" conducted by ELSTAT, we examine the evolution of key ICT and e-commerce indicators (PC usage, internet access, website availability, electronic orders) over time. In addition, with the use of econometric analysis we investigate the role of ICT infrastructure, human capital and firm characteristics (size, industry, location) in e-commerce adoption. Moreover, factors that may hinder ICT adoption and obstruct Greek firms' e-sales are identified.

According to our findings, the vast majority of Greek firms use PCs and have internet access, while the number of firms that have a website is increasing. On the other hand, the spread of e-commerce in Greece is still quite limited and seems to have remained relatively stable over the period under examination. The econometric findings indicate that investing in ICT infrastructure and human capital is important for the adoption of e-commerce. As far as size is concerned, the results demonstrate that smaller companies are more likely to receive electronic orders compared to larger companies. In addition, firms operating either in the trade or the services sector have an increased probability of adopting e-commerce practices, in comparison with manufacturing firms. Moreover, the location of the firms seems to play an important role, since it was found that firms located in the regions of Attica and Central Macedonia have a decreased likelihood of engaging in e-commerce activities compared to firms located in the remaining regions of Greece. Moreover, it appears that Greek firms face significant obstacles as far as e-commerce is concerned. These barriers are associated with the unsuitability of firms' products/services for e-sales (based on firms' perceptions), the high cost of implementing and using e-commerce technologies, problems related to payments and problems related to the legal framework.

The results presented may be useful in the design and implementation of policies that will encourage and support ICT and e-commerce adoption. Given the importance of infrastructure and human capital for e-commerce, an effective government action plan could include specially designed actions for the technological upgrading of firms in order to develop e-business and e-commerce solutions, flexible training programs for ICT specialists, distance learning and mobility programs for exchanging and enhancing ICT skills at all levels of education and so on. Furthermore, barriers to e-commerce could be mitigated, at least to some

extent, through regional campaigns to inform and educate entrepreneurs about regulations, procedures, opportunities, and the potential medium-term and long-term benefits of e-commerce.

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Applying behavioural insights to policy-making

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Abstract

The past few years have brought increased research interest and use of findings derived from behavioural sciences in policy-making. To this end, international organisations and the governments of several countries have created specialised teams. This article aims to present the potential offered by behavioural insights and report examples of behavioural interventions in several areas (such as taxation, savings, protection of depositors, investors and consumers, health, saving energy, education and employment), highlighting, at the same time, the behavioural dimension that exists in all research and policy areas, which should not be ignored. The article provides useful conclusions and suggestions for policy-making in Greece.

Key words: *behavioural sciences, behavioural insights, policy-making.*

1. Introduction

The important role of psychology in the economy, along with the finding that people are predictably irrational (see Ariely, 2008) in various aspects of their economic and social life, has increased research interest in the use of findings derived from behavioural sciences in policy-making. International experience has indicated that emotions impact the decision-making process, especially in times of significant economic changes. Thus, over the last decade there has been increasing recognition of the usefulness of behavioural findings, focusing on the way people make decisions in practice rather than in theory. These findings contribute to the understanding of human behaviour in order to develop more targeted and effective policies in different areas which complement traditional approaches.

The recent (2017) Nobel Prize award in Economics to Professor Richard Thaler is a practical recognition of the scientific community for his contribution to behavioural economics. According to Thaler (2017), understanding human nature can improve the explanatory power of economic theory and help find solutions to various public policy problems. Indeed, Thaler and Sunstein's (2008) book, titled *Nudge: Improving Decisions on Health, Wealth, and Happiness*, is believed to have inspired the creation of specialised nudge units in public and private organisations all over the world.

The aim of this article is to present the potential offered by the use of behavioural findings in policy-making, to report examples of several interventions and to highlight the behavioural dimension that exists in all research and policy areas, which should not be ignored. The rest of the article is structured as follows: Section 2 presents the theoretical/conceptual framework. Section 3 describes international developments on the use of behavioural findings in policy-making. Section 4 provides examples of policies that have been applied internationally and could, under certain conditions, constitute examples of good practice. Finally, the article provides useful conclusions and suggestions for policy-making in Greece.

2. Conceptual framework

Behavioural sciences combine knowledge and research methods from a number of disciplines (including economics, psychology, sociology, neuroscience) and systematically study human behaviour using observation and experimentation (EC, 2016a).

Empirical research has highlighted that individuals are influenced by the way alternative options and information are presented to them (framing). They are significantly affected by default options, they often make myopic decisions and show inertia due to loss aversion (Ciriolo, 2011). Moreover, although providing information is to the benefit of individuals, information and choice overload may create confusion. For this reason, simple, empirical rules (heuristics) are often used. Even though heuristics may simplify and speed up the decision-making process, they could result in mistakes

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when individuals make quick decisions. In a broader context of analysis, Simon (Nobel Laureate in Economics, 1978) presented the concept of bounded rationality in the decision-making process in which individuals are able to make satisfactory but not necessarily the best decisions (satisficing) (see Simon, 1979).

Consequently, cognitive and behavioural biases as well as limitations in the decision-making process[1] may cause deviations from rational behaviour that traditional economic theory cannot adequately explain. The gap between theory and practice is bridged by behavioural economics, which applies the principles and findings of psychology to human behaviour in order to explain the economic decision-making process. Moreover, psychologist Daniel Kahneman, the Nobel Prize winner in Economics (2002), uses the term "applied behavioural science" to describe the common research field of psychology and economics (see Shafir, 2013).

A recent European Commission report (EC, 2016a) points to the difference between behavioural insights and nudge. Behavioural insights are the result of research in behavioural sciences in order to better understand human behaviour and decision-making in everyday life. On the other hand, the work of Thaler and Sunstein (2008) highlighted the concept of nudge, which refers to "any aspect of the choice architecture that alters people's behaviour in a predictable way, without forbidding any options or significantly changing their economic incentives." Therefore, it is not about orders or prohibitions, but simple/easy interventions that may induce behaviours and decisions without limiting personal freedom.

It is, therefore, clear that behavioural insights do not only focus on the choice architecture. Behavioural insights are wider and serve as input in the policy-making process, supporting a wider range of tools, and can be integrated and used along with traditional interventions (regulations, information requirements, etc.) (EC, 2016a). The use of behavioural insights creates the preconditions, but cannot guarantee the desired policy outcome, while there are cases in which the application of traditional interventions or even no intervention is preferable.

3. International experience

In recent years, the significant contribution of behavioural insights in policy-making has been recognised by major international organisations. For example, the OECD since 2013 supports public organisations that use behavioural insights in order to improve public policy. At the same time, specialised units or teams such as the Foresight and Behavioural Insights Unit in the European Commission (since 2014), the UN Behavioural Initiative at the United Nations (since 2016) and the Mind, Behavior, and Development Unit at the World Bank (since 2017) have been created. Apart from their own actions, they also contribute to research by reporting international interventions and experiences (see *inter alia*, World Bank, 2015; EC, 2016a; UN, 2016; OECD, 2017).

Moreover, at the national level, several governments have created specialised teams to use the findings of behavioural sciences in policy-making or have explicitly asked national bodies or policy departments to use this knowledge. The United States and the United Kingdom have been pioneers in the use of behavioural insights and their example has been followed by other countries such as Australia, Canada, Denmark, Germany, Israel, the Netherlands, New Zealand, Norway, Singapore, South Africa, Turkey and others (OECD, 2017).

The Behavioural Insights Team, the world's leading body for the implementation of behavioural sciences, also acting as an internal adviser to policy-makers, was created in the United Kingdom in 2010. Moreover, the Social and Behavioral Sciences Team was created in the US in 2014. Following the publication of Thaler and Sunstein's aforementioned 2008 book, Professor Sunstein was appointed Administrator of the US Office of Information and Regulatory Affairs by President Barack Obama in 2009, and Professor Thaler became a consultant to the Behavioural Insights Team established by the Government of David Cameron in the United Kingdom in 2010.

Note that according to the recent European Commission report (EC, 2016a), even in cases where no specialised team has been formed in the public administration, the implementation and the results of behavioural insights are evident in most EU countries.

Finally, the contribution of other non-governmental research teams, such as the Behavioral Insights Group at Harvard Kennedy School (since 2013), should also be acknowledged since they focus on improving the decision-making process of both policy-makers and individuals.

1. For a detailed presentation and categorization of the most important behavioural biases, see, among others, Hirschleifer (2001), Camerer and Loewenstein (2004), Montier (2007).

4. Examples of behaviourally-informed policy interventions

Behavioural insights resulting from the examination of the decision-making process and the understanding of the related behavioural biases may provide innovative approaches beyond the traditional interventions and improve policy design and implementation. Here are some successful initiatives that have been implemented in a number of countries in several areas, such as taxation, savings (financial planning), protection of depositors, investors and consumers, health, energy saving, education and employment.

4.1. Taxation

In the area of taxation, there are several examples of interventions aiming primarily at tax compliance and fighting tax evasion. These interventions differ according to the means they use to reach their goal.

Receipt-based tax lotteries

Since the end of 2017, a receipt-based tax lottery scheme has been implemented in Greece by the Independent Authority for Public Revenue (IAPR). The participation is limited to receipts from goods or services bought using cards or other electronic means of payment, to be eligible for winning a prize of 1,000 euros each month for 1,000 lucky winners. In this way, individuals are encouraged to ask for legal receipts and use electronic payment instruments. The use of lotteries has been applied in several European countries with differentiations e.g. Malta (1997), Slovakia (2013), Portugal (2014), Romania (2015), Poland (2015), and their first application dates back to the 1950s in Taiwan (Fooken et al., 2015; EC, 2016a). The initiative is based on the finding that individuals tend to over-weight small probabilities and focus more on the reward than on the probability of winning it. This is useful in cases where it would be very expensive to provide economic incentives to the entire population (e.g. € 1 for each receipt) in order to encourage the desired behaviour.

Similarly, with a view to fight the black economy, tax evasion and unfair competition, the Croatian Tax Administration launched a lottery-like competition in which they asked tourists to collect 20 receipts for purchases made in Croatia from 1/8/2015 to 2/10/2015. This initiative aimed to encourage tourists to ask for legal receipts in order to win a trip to Croatia the next year. In addition, the communication of this competition used behavioural messages employing framing (e.g. with the phrase "Every receipt you take is an assurance of a more organised society and a more secure future.") and social norms (e.g. with the phrase "call us at our toll-free number and report the fiscalisation subject who doesn't respect the rules, in contrast to a large majority of others") (Croatian Tax Administration, 2015; EC, 2016a).

Behaviourally-informed letters

Recent empirical research focuses on the use of different behavioural messages in the communication with taxpayers in order to increase tax compliance and improve tax debt collection. The effectiveness of tax reminders has been examined via randomised controlled trials (RCTs) in several countries such as Australia (Wenzel, 2005), Denmark (Kleven et al., 2011), Germany (Dwenger et al., 2016), Poland (Heldandez et al., 2017), the United Kingdom (Hallsworth et al., 2014), the USA (Blumenthal, Christian and Slemrod, 2001), etc. These tests are low cost and easily implemented as they are based on data available to tax authorities. Empirical findings from the United Kingdom indicate the effectiveness of this approach. Some of the messages that have been tested either concern social norms (e.g. how many people pay on time), or associate taxes with the gain or loss of public goods. According to Hallsworth et al. (2014), in the first case, the payment of declared tax liabilities increased by 5.1% within 23 days of the delivery of the letter, while in the case of gain or loss framing of public goods, an increase of 1.6% was observed.

Certainly, the effectiveness of behaviourally-informed letters varies not only among different countries but also among taxpayers in the same country and should therefore be considered on a case-by-case basis. Interestingly, there are findings of such an intervention in Poland, according to which the effectiveness of messages depends on the taxpayers' characteristics (Hernandez et al., 2017). According to the authors, the effect of a particular message varies according to the age, gender, geographic location of the debtor and the amount due. For example, mentioning public goods in the letter improved tax compliance among people aged 20-29, but had a negative impact on tax compliance among people aged 50-64. This result can be interpreted by taking into account the public goods mentioned in the behavioural message of the letter (e.g. kindergartens, schools, roads and security), as younger people are more likely to benefit from them (or some of them) and be motivated to pay their tax debt when they receive a reminder. According to this finding, if the observed variation can be attributed to the choice of the public goods mentioned in the letters, then tax compliance could be strengthened by changing the public goods mentioned so as to appeal

to different demographic groups. In addition, according to the authors, messages regarding public goods are more effective in rural areas, perhaps due to a closer connection with the effect of the relevant government expenditure and the existing relationship with the community.

Apart from individuals, the use of behaviourally-informed letters seem to be effective for companies as well. More specifically, the BIT (2016) examined the effect of alternative letters on companies that recorded tax debts for the first time, considering that this was a good time for an intervention, and that timely feedback could prevent a company from systematically delaying payments. So, along with the standard letter, two additional letters were tested. The former had a behavioural message similar to that sent to individuals, which was based on social norms, i.e. the vast majority of entrepreneurs in this sector pay their taxes on time and most people with a similar debt have already paid it. Of course, this holds for the UK and that is why it is mentioned in the letter. The second letter had educational/informational content about the most common cause of corporate tax debts in the UK, i.e. mistakes in filling in the statements, and provided useful advice. Within two weeks of receipt of the letter, both versions of the new letters resulted in an increase in the proportion of companies that paid their tax obligations. The letter with the educational/informational content was more effective and increased payment rates from 41.4% to 47.5%, while the letter with the behavioural message increased payment rates to 44.7%. Moreover, according to the empirical findings, both new letters were more effective for taxpayers with larger debt.

Simplification of procedures

Simplification of administrative procedures via the creation of pre-populated online tax returns can also improve tax compliance by reducing the burden of the large amount of information and the effort required by taxpayers to comply as well as the cost of tax management. This approach is applied by several European countries (EC, 2016a), such as Austria, France, Hungary, Italy, Spain, and Greece.

An additional intervention was examined by the BIT in the UK (BIT, 2014) in order to improve tax collection rates by making it easier for taxpayers to pay. This was a simple but effective intervention to send letters to taxpayers directing the recipients to the specific form they had to fill in and not simply to the website that contained the form. Although this was only a small change in the content of the letter, which slightly reduced the difficulty for taxpayers, it resulted in increased response rates from 19.2% to 23.4%.

Actions to raise awareness and change taxpayers' behaviour

Another key factor to achieve tax compliance is the development of a sense of fairness, trust and confidence in the effectiveness of the tax system and the public sector in general. To this end, the Austrian Federal Ministry of Finance conducted a pilot program to improve tax compliance using a range of educational activities and tools, for example via educational videos that promote a sense of reciprocity, fairness and transparency, and highlight the way in which taxpayers' money is used. At the same time, tax and customs officers visited schools (as part of an educational program) to explain to students the usefulness of taxes in providing the means to support society. Within the framework of the same initiative, a website was created, specifically designed for young people, providing e-learning tools and messages in order to promote tax compliance (see Elmecker, 2014; EC, 2016a).

In the same spirit, the Tax and Customs Board in Estonia frequently conducts information campaigns to raise awareness and change taxpayers' views so that taxes may be seen not only as a burden, but as a contribution to fund public projects and benefits. There are also other information campaigns that highlight the cost of non-payment of taxes/contributions by taxpayers, for example in the case of undeclared work (EC, 2016a).

In Bulgaria, an information campaign against the illicit cigarette trade was carried out with the co-operation of the government and an independent institute, focusing on the fact that the illicit cigarette trade supports various forms of organised crime (EC, 2016a). This message used affect and framing to indicate the serious impact of the illicit cigarette trade, not only on the economy and health, but also on society in general.

Obviously, in order to measure the effectiveness of the above initiatives, a clear distinction should be made between taxpayers who choose not to comply and taxpayers who are objectively unable to meet the deadlines of their obligations. In the second case, individuals and companies, though willing to pay on time, are unable to do so and discouraged to comply (Arcos Holzinger and Biddle, 2016). The Swedish Tax Agency has introduced a comprehensive, preventive approach to improve compliance from the early stages of the tax process with the "Right from the Start" model (see OECD, 2012; Walsh, 2012). Initially, the taxpayers who are not likely to comply or already have not complied are identified. A set of procedures follows to encourage compliance in a flexible and cost-effective way. This approach includes training, active contact and commitment to taxpayers, facilitating compliance, and cre-

ating a relationship of trust with the tax administration and positive social norms. This approach is particularly useful for new business owners as, according to Kamleitner et al. (2012), they have not yet established specific patterns (behavioural, perceptional, etc.) and can therefore develop a culture of paying taxes in a climate of mutual trust and co-operation.

4.2. Savings (financial planning) and protection of depositors and investors

Behavioural interventions on savings are based on research findings according to which procrastination, inertia, projection bias, and status quo bias may result in people not saving for their retirement. Having recognised the personal constraints that affect the decision-making process, the UK Department for Work and Pensions introduced an automatic retirement scheme in October 2012 in order to increase employees' savings, providing them at the same time the option to quit the program (see Hardcastle, 2012; UK Department for Work and Pensions, 2013, 2015). Individuals will either decide to stop saving or keep the default option to participate in the retirement plan. Under these circumstances, if no action is taken, inertia may work for the benefit of saving and the individual. Similar schemes for automatic participation in pension plans have been implemented in the USA, Denmark, Sweden, etc. (BIT, 2014).

A related approach concerns the Save More Tomorrow™ (SMarT) program (Thaler and Benartzi, 2004), which is based on the idea that employees can commit themselves today to increase their savings rate in the future, whenever they receive a pay increase and up to a maximum predetermined level. Although employees are able to quit the program any time, in this case inertia seems to work for their benefit, too. In fact, the features of the program may reduce the perceived loss aversion (of a part of their income) in the interest of saving.

In addition, a recent study conducted by the UK's Financial Conduct Authority examines the fact that depositors with savings accounts do not always react when the interest rates that were initially offered to them decrease (Adams et al., 2015). This behaviour is mainly related to the fact that depositors fail to compare the long-term benefit with the short-term cost to change bank or account, as well as to inertia and lack of attention to savings decisions. According to the findings, depositors who received a relevant reminder letter before the interest rate was reduced were more likely to change bank or account than those who either did not receive a reminder or received it after the interest rate cut.

4.3. Consumer protection

The first attempt of the European Commission to use behavioural insights in policy making was in 2008, proposing a Directive on consumer rights to the European Parliament and the European Council. The proposal also included a clause limiting the use of default options in consumer contracts (EC, 2011). Although, according to rational models, changes to the default options should not affect the decision-making process, as the optimal choice remains the same, the existing literature provides empirical findings that highlight their impact on the decision-making process (see, for example, Smith et al., 2009). This means that vendors could influence buyers' choices depending on the default option set. The effect is expected to be significant in electronic transactions that may involve pre-selection of a product among alternatives or additional components or features that may be added (or removed) from the product's standard characteristics (Lunn, 2014). Thus, the EU Consumer Rights Directive (2011/83/EU) has prohibited the use of default options in online sales for contracts after mid-2014. Such examples are, among others, the default option of travel insurance with the purchase of an air ticket, the default option of meals with the purchase of accommodation, etc.

Another example of framing in the decision-making process relates to consumers' information about the fuel consumption of vehicles. Since consumers are not able to directly observe fuel consumption, in many countries there are regulations that provide for the use of a standard measure that makes comparisons possible (Lunn, 2014). Such a measure is the distance per unit of fuel (e.g. kilometer per liter, miles per gallon). However, according to Larrick and Soll (2008), adopting this measure may cause a cognitive illusion as consumers may consider the difference between 10 and 11 kilometers per liter and the difference between 20 and 21 kilometers per liter comparable, since in both cases the difference is 1 kilometer per liter. To the extent that this is not well understood by consumers, they may not buy the most efficient vehicles. Having recognised the potential impact on consumers' decision making process, the US Environmental Protection Agency made changes, during the period 2010-2011, to the regulations of car labeling about the features to be found on the windows of new cars for sale. Since the cost of driving a car depends essentially on the amount of fuel required for a certain distance, the new regulations also required that fuel consumption in gallons per 100 miles is presented as well as an estimate of the annual fuel cost for typical use.

The US intervention for consumer financial protection with the 2009 Credit Card Accountability Responsibil-

ity and Disclosure (CARD) Act is also interesting (see Lunn, 2014). International experience suggests that people's decision-making process is not time-consistent as they tend to excessively discount large (potential) future costs when deciding for immediate purchases. In addition, some consumers show inadequate attention to possible costs, such as fees or changes in interest rates and terms of the agreements. In other cases, consumers may be too optimistic when estimating possible costs or ignore compound interest, or even anchor their credit card payments to the minimum payment information provided, which may be treated as advice. Trying to overcome these problems, a series of fees that seemed to be hidden was forbidden, providing at the same time helpful and timely information. Yet another important action was to decline transactions when they exceed the credit limit, beyond which the consumers are charged, unless they have explicitly made that choice. In addition, new rules have been introduced to define more precisely late payments, terms and conditions, the number and size of financial penalties, and to prohibit inactivity fees, etc. as well as provide a clear calculation of the time and cost of repayment of the balance through the minimum monthly payments and a corresponding calculation of repayment cost within 36 months.

4.4. Health

Default options may also have a significant impact on organ donation. According to Johnson and Goldstein (2003), the implementation of a system that assumes by default that individuals agree to become organ donors could significantly increase the number of donors and lives saved by them. For example, there is an opt out system in Greece, where all citizens automatically become potential donors, provided they have not explicitly stated their opposition and with their family's consent to become donor. Similar systems with small variations on a case-by-case basis have also been applied in other European countries, such as Austria, Belgium, France, Spain, Italy, Luxembourg, Norway, Hungary, Poland, Portugal, Slovenia, Sweden, the Czech Republic, and Finland (Zúñiga-Fajuri, 2015; EC, 2016a).

Moreover, there are several interventions regarding healthy eating. In Sweden, Norway, Denmark and Iceland, as part of the effort to encourage healthy eating, products that meet predefined criteria (e.g. low in fat, sugar, salt, etc.) can be labeled with a "Green Keyhole" (Sjölin, 2013). This practice makes it easier and obvious to identify healthy food options. The choice of labeling is optional and free of charge for producers who wish to use it. They have the responsibility to check and meet the standards set by the four countries. In the same direction, in Estonia, the government provides online nutrition information to citizens in a simplified way. For example, there is an electronic application that calculates the amount of salt consumed on a daily basis and allows for comparisons of alternative food options by giving information on the maximum daily recommended quantity of consumption in a personalised, simplified and obvious way (EC, 2016a).

Other interventions aim to reduce smoking and increase awareness of its negative health effects. A well-known example of a behavioural approach to reduce smoking concerns the obligation of all EU member states from May 2016 to put on the cigarette packs both informative messages pointing to the dangers of smoking and images supplementing the written message, covering a total of 65% of the two sides of the pack (EC, 2016b). In this way, the message is as clear and comprehensible as possible, aiming at people's emotions by visualizing the serious effects of smoking. According to the World Health Organization, illustrated warnings about the effects of smoking on health are an effective way to raise public awareness about the risks involved. At the same time, international empirical findings indicate that strengthening alert-based policies should be a priority for smoking control (Noar et al., 2016).

Additional initiatives are implemented in individual countries. For example, in Latvia, the Disease Prevention and Control Centre, in collaboration with the Ministry of Health, conducted an awareness campaign to combat youth smoking, using framing, people's tendency to be immediately satisfied and present bias, pointing out the desired message in an obvious way. Among other things, the campaign provided an application for calculating the (daily, monthly, and annual) savings from smoking reduction, presenting this financial benefit in terms of attractive products (e.g. with the picture of a laptop) along with the message: "This is just one of the things you will be able to buy with the money you spend on cigarettes." (EC, 2016a). In the same spirit, the Portuguese Ministry of Health has conducted a campaign to raise awareness of the effects of smoking on non-smokers (passive smokers) and children, using short videos, radio ads and posters, highlighting the fact that "when someone smokes everyone smokes" (EC, 2016a).

4.5. Saving energy

Protecting the environment and saving energy are key priorities. In this context, the Regulatory Authority for Electricity, Gas and Water in Italy, in co-operation with the University of Salento, examined the impact of pro-

viding consumption information data to better inform consumers (OECD, 2016). To this end, they examined the impact of different types of information about energy use on consumer behaviour, in terms of its frequency, content and framing. This approach is based on loss aversion, feedback and framing. According to the results of an experiment involving 300 students, continuous feedback is very useful as it increases learning and awareness. It proved to be helpful in providing information on the evolution of energy consumption not in terms of energy, but in terms of cost, as well as costs related to inefficient use, for example compared with the cost of the previous bill. The selection of the appropriate benchmark is critical in order to draw conclusions and make comparisons (e.g. average, best/worst performance of similar consumers), as comparisons with inefficient energy users do not motivate consumers to improve their own energy use. The findings were used to redesign electricity and gas bills in order to provide more information to consumers, raise awareness and improve the energy use of electrical appliances.

Moreover, in 2015, the Swiss Federal Office of Energy examined the effect of providing additional information on the energy operating cost of electrical appliances (e.g. tumble dryers, vacuum cleaners, freezers and televisions) over their useful life compared to the average appliance of their category (see Schubert and Stadelmann, 2016). The experiment tested the impact of the standard energy label on the basis of the European requirements as well as an alternative label with additional information on operating costs over its useful life compared to the standard case of no provision of information on energy efficiency. Overall, it has been found that additional energy operating cost information over the useful life of the product resulted in a larger reduction in the average annual electricity consumption of tumble dryers (which consume a lot of energy). Results for other appliances vary. A specialised platform (TopTen.ch) has been created in Switzerland in order to provide annual energy consumption and lifetime energy operating cost data for different product categories (EC, 2016a). In this way, Swiss consumers are better informed about energy savings and this framing limits present bias as well as loss aversion, making it easier to compare the current purchase price of the appliance with the overall savings associated with it.

4.6. Education and employment

Certainly, adults who do not have literacy and numeracy skills tend to be less productive in their work, receive lower wages, are more likely to have health problems and experience social exclusion (BIT, 2015). The Behavioural Research Center for Adult Skills and Knowledge (ASK) was established in 2014 in the UK to conduct research in this area. One of the first problems identified was the deterioration in attendance rates of adult educational programs. Many college programs in the UK were experiencing a 20% reduction in participation over a 10-week period, with the largest reduction after a one-week break in the middle of the program. To address this issue, ASK examined the effectiveness of sending text messages to program participants, which were based on positive feedback, social support, organisation and planning. This resulted in a 7% increase in average attendance for participants receiving text messages compared to those who did not. In addition, the post-mid-year drop-out rate was reduced by 36% for those who received text messages (OECD, 2016).

The use of text messages also finds practical application in improving the job search system for the unemployed. According to the BIT (2015), an intervention took place in Bedford, using text messages to test the effectiveness of encouraging job seekers to participate in job fairs. Text messages were used to inform people when job opportunities arose. The BIT examined the effectiveness of different messages. According to the results, messages based on reciprocity proved to be the most effective, i.e. messages indicating that the job counselor had done something specifically for them in the event (e.g. a scheduled meeting) and personally wished them good luck. These messages were more efficient than those including only the meeting-related information or those based on a personal message, but with no reciprocity element.

5. Conclusions and suggestions for policy-making

The effectiveness of public policies depends to a large extent on how individuals react to them, as well as on the extent to which people's real behaviour is taken into consideration when designing them. Unrealistic assumptions about people's behaviour may result in policies with unpredictable results. Only when we know the cause of a problem can we deal with it effectively. If, for example, people's behaviour is primarily determined by lack of knowledge and information, then education and information will help address possible problems. If, however, the individuals' behaviour is determined by behavioural biases (e.g. loss aversion, default options bias, etc.), then it is appropriate to take these into account in the policy-making process (see Ciriolo, 2011).

This article provides a review of international trends in the use of behavioural insights in policy-making, as

well as a brief presentation of several interventions that have been implemented mainly in the EU and the US. The list of behavioural interventions at the international level is extensive and constantly expanding. Although this review cannot exhaust the particularly rich literature, it is indicative of the existing interventions in key areas such as taxation, savings, consumer/investor protection, health, saving energy, education and employment. Moreover, it provides useful conclusions, which could also be used in Greece.

The reported interventions at the international level have low cost (e.g. sending text messages) or even zero cost (e.g. redesigning letters to tax debtors). However, they are often effective both in monetary terms (e.g. increased tax collection) and in terms of health (e.g. increased number of organ donors) and quality of life (e.g. better dietary habits).

In many cases the proposed interventions are implemented in many countries (e.g. letters to increase tax compliance, lotteries, organ donation, healthy food labeling). Consequently, the reported interventions are potentially good practices which, under certain conditions, could be effective for other countries too, such as Greece.

Note that Greece, whether due to obligation (e.g. European consumer protection legislation) or by choice (e.g. tax lotteries), already applies interventions based on behavioural insights. Taking into consideration the limited financial resources of the country, it may be even more necessary to undertake small interventions with low or even zero cost which may have significant positive effects. In many cases, the possibility of applying the interventions mentioned above could be examined. For example, policy-makers could consider:

- Regarding the crucial issue of tax compliance and the fight against tax evasion: (a) extending the program of public lotteries to tourists from abroad (see the example of Croatia), e.g. a quarterly lottery for a trip to Greece (selecting from a series of destinations) the following year; (b) appropriately modifying written communication with taxpayers and debtors, with reference to social norms and the association of taxes with the gain/loss of public goods[2] (see the examples of the UK and Poland), possibly providing feedback from taxpayers by expressing their views on the area where they feel that there is greater need to use these resources. Similarly, for companies, appropriately modifying written communication, as well as the provision of information, support and guidance to deal directly with debt repayment difficulties could be considered (see the example of the UK); (c) undertaking communication actions with a view to develop a sense of trust and confidence in the effectiveness of the tax system (see the example of Austria) and raise awareness of the additional difficulties that tax evasion creates in the economy and society in general (see the examples of Estonia and Bulgaria).
- Regarding savings: (a) enhancing financial education for both adults and children in order to understand the behavioural biases that they will have to face in the financial planning process in order to save for an emergency and for their retirement; (b) undertaking communication actions to make individuals familiar with the automatic participation programs in order to achieve consistency in their savings; (c) undertaking communication actions to ensure depositor/investor confidence in the banking/financial system, taking into consideration recent findings (Economou and Triandopoulos, 2018) which identify economic sentiment, among other factors, as a determinant of household deposits in Greece during the period 2003-2014.
- Regarding consumer protection: undertaking communication actions to inform consumers about the impact of framing on all aspects of everyday life, e.g. online purchases, credit card accounts, etc.
- Regarding health: using healthy food labeling (see the example of Sweden, Norway, Denmark and Iceland), making absolutely clear which products are healthy for consumers and, in particular, for children.
- Regarding saving energy: (a) redesigning the electricity consumption bills and the provision of information that make comparisons with the consumption cost of the previous month, of the corresponding month of the previous year, of the average household in the region possible (see the example of Italy); (b) providing information to capture the total cost of energy consumption over the useful life of electrical appliances (see the example of Switzerland) in order to facilitate the purchase of energy-efficient appliances.
- Regarding education and employment: (a) testing the impact of reciprocity and frequent personalised communication on the educational process and/or the assistance to find work in Greece, and then;

2. Note that in 2011 the Ministry of Finance provided information (along with the tax note) to the taxpayers on the contribution of their taxes to the Government Budget (in euro) by category, e.g. social security and pensions, health and social solidarity, education, defense, etc.

(b) undertaking relevant informational actions for teachers and work counselors.

The literature provides a wealth of empirical findings and international experience provides a number of examples of behavioural interventions. In general, it is recommended to systematically apply these findings in policy-making. The co-operation of the government with universities and research institutes in Greece and abroad could contribute to this goal using the experience and knowledge of specialised scientists (economists, psychologists, sociologists, etc.) and public administration executives either in the form of advisory support, or even with the creation of a specialised team.

At the same time or/and independently of the national level, behavioural insights could also be used in regional policy-making. Even if this issue has not yet been extensively examined, behavioural interventions could encourage the desired behaviour of entire organisations, having an impact on people working in them or via targeted policies. According to the *OECD* (2018), behavioural insights could be used in the regional development policy planning for:

- The decision-making process concerning the more efficient use of funds and the selection of investment projects.
- Improving co-ordination, communication and co-operation among the actors involved, for example by actively involving stakeholders in policy-making that they will later be called upon to implement. In this way, a climate of co-operation, justice, involvement and commitment of all the actors is created. The Alliance for Entrepreneurship and Development of Western Greece (SEADE)[3] is an example of such involvement between broader public administration and local-government bodies, chambers, the academic and research community, the business community and the producer organisations. Another example is the involvement of stakeholders in the consultation of the five-year Regional Operational Programs.
- Simplification of directions and procedures, for example, in relation to public procurement or grant applications.
- Better understanding of the use of rewards and incentives in organisations and not just sanctioning mechanisms, aiming at enhancing the capacity of local and regional governments to propose effective projects and create incentives to implement best practices.
- Working with independent research institutes or independent evaluation institutions to boost citizens' confidence as well as guarantee transparency of results. This puts stronger pressure on local authorities for the consequences of their actions or omissions.

In any case, according to the BIT (2014), behavioural interventions should have specific characteristics. They should be: (a) easy, i.e. simple and should not require much effort by individuals; (b) attractive, i.e. attracting attention and offering incentives or rewards; (c) social, i.e. describing positive behaviours of the majority of people, using social relationship networks and collective action as well as encouraging people to commit to others and (d) timely, i.e. be applied when people are likely to be more receptive, take into account immediate costs and benefits, help people to plan their response to events, as there is often a gap between intentions and actions.

Note that, although several behavioural interventions have been successfully implemented in several countries (sometimes with modifications), it is not necessary that any intervention be able to deliver the expected results in any country. It is clear that culture, experience, and economic and social conditions define the priorities and choices of individuals and inevitably affect the effectiveness of individual interventions. In addition, the same intervention may differ significantly in its effectiveness depending on its timing.

Another crucial issue is that in several cases it is difficult to accurately determine the effectiveness of the interventions as they are not only aimed at economic benefits for national, regional or local government, but also aim at protecting individuals (consumers and investors), the environment, health, etc. In addition, interventions take place in the real world and not in the laboratory where all other conditions remain the same. Randomised controlled trials (RCTs) (and/or other appropriate methods) should be used in advance, wherever possible, in order to estimate the potential benefits of the interventions under consideration. Benartzi et al. (2017) emphasise the need to measure the effectiveness of behavioural interventions. To this end they calculated ratios of impact to cost for several interventions and concluded that behavioural interventions often have better results compared to traditional ones. Measuring the results is critical in order to effectively

3. The SEADE network was proposed and implemented in Western Greece as part of the region's action plan which won the European Entrepreneurial Region Award for 2017. For more information see <http://www.pde.gov.gr/eer/>.

determine the net effect of an intervention, i.e. whether the policy benefits outweigh the costs involved, in order to examine the possibility of maintaining, modifying or even terminating the intervention.

In conclusion, behavioural interventions are not a panacea and in many cases cannot fully solve the respective policy problems. However, small, low or zero cost interventions may have significant effects along with traditional approaches. Therefore, it is worth systematically and thoroughly investigating the appropriate interventions where it seems that they can have positive results.

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