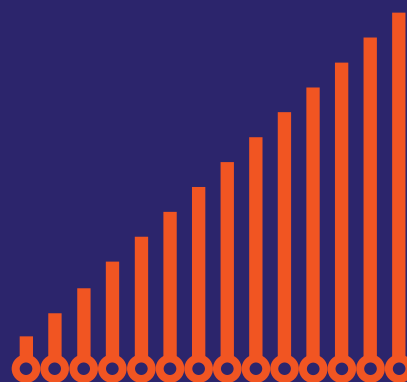
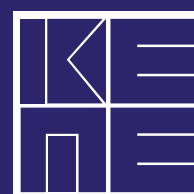


GREEK ECONOMIC OUTLOOK



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



GREEK

Economic Outlook

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The GDP annual growth rate in Greece in the first quarter of 2019 remains on an upward trend, but has weakened relative to the previous year. This confirms that the recovery of the Greek economy continues for the ninth consecutive quarter, while in absolute terms the country's GDP is the highest since the first quarter of 2012. Finally, with the forecasts of the Medium-Term Financial Strategy Framework 2020-2023, the Greek economy is expected to grow this year at an annual rate of 2.3%, while the Commission expects 2.2% growth, compared with 1.9% and 1.8% projected by the Bank of Greece and KEPE, respectively.

However, these dynamics have developed in the shadow of the slowdown of the Eurozone economy and the widening economic gap between our country and the Eurozone North. Several economists claim that this differentiation reflects significant productivity deviations within the Eurozone.

The issue of boosting productivity is a central priority of our country and of all the Eurozone countries. KEPE is expected to play a catalytic role and be a helper in this effort as the "National Productivity Board" (NPB). According to the recommendation of the Five Presidents of the European Union (10083/16 / ECOFIN 590 UEM 248), each member country of the Eurozone has to set up an NPB. The Greek Government, under Law 4605/2019, authorized KEPE as the

Greek NPB, which cooperates with the corresponding European national boards.

As usual, the 39th issue of KEPE's *Greek Economic Outlook* is presented in two parts. Part One examines recent developments and prospects for the main components of demand, the Consumer Price Index in Greece and the Eurozone, as well as the factor model forecasts for the short-term prospects of GDP. Public finance is examined through an analysis of the evolution and structure of public debt. Recent developments in key variables of the Greek labour market are discussed, as well as the issue of income inequality in the EU15.

As far as sectoral policies are concerned, the articles present analyses of the trends in tourism in Greece, the changes brought about by the financing of the Hellenic Development Bank, the developments in the Greek agricultural sector and the external trade of agro-products.

Finally, on the occasion that KEPE is the Greek NPB, the second part of the issue hosts the article "Multi-dimensional analysis of the productivity of the Greek economy", which, as the title shows, focuses on productivity.

NIKOLAOS RODOUSAKIS
Editor

1. Macroeconomic analysis and projections

KEPE, *Greek Economic Outlook*, issue 39, 2019, pp. 4-14

1.1. Main demand components: Developments and prospects

1.1.1. Introduction – Domestic and external demand

Yannis Panagopoulos

Based on the existing data, we analyze next the trend of the Greek economy. The first thing that we verify here, based on Table 1.1.1, is the slight im-

provement, compared to 2017, in the rate of growth of the economy. More specifically, the recorded economic growth for 2018 was 1.9% (+ 0.4%) compared to 1.5% in 2017. Actually, we could briefly point out that the reason for this improved rate of GDP growth, compared to 2017, should be primarily attributed to the positive rate of change of private consumption (1.1%) and the clearly higher level of growth in exports versus imports (8.4% versus 4.2%). In contrast, the contribution of public consumption was negative (-2.5%), compared to 2017, as were fixed capital investments (-12.2%).

On the basis of the existing components of the recorded *domestic demand*, *private consumption* is, on

TABLE 1.1.1 Basic macroeconomic figures

	Mill. euro (current prices)	Annual % change (constant prices)	
	2018	2017	2018
Private consumption	125,614	0.9	1.1
Public consumption	35,363	-0.4	-2.5
Fixed capital formation	20,454	9.1	-12.2
Domestic demand*	181,431	1.56	-1.28
Exports of goods and services	66,736	6.8	8.7
Exports of goods	36,637	5.7	8.4
Exports of services	30,099	8.5	9.3
Imports of goods and services	67,218	7.1	4.2
Imports of goods	58,085	7.1	1.1
Imports of services	9,133	9.1	14.4
Balance of trade (goods & services) (% GDP)	-0.26		
GDP	184,714	1.5	1.9
<i>Contribution to the change in GDP</i>			
Domestic demand*		1.62	-1.32
Balance of trade (goods & services)		-0.27	1.34
Change in inventories		0.01	1.80

Source: *National Accounts* (ELSTAT) & EC Forecasting, Spring 2019.

* Without change of inventories.

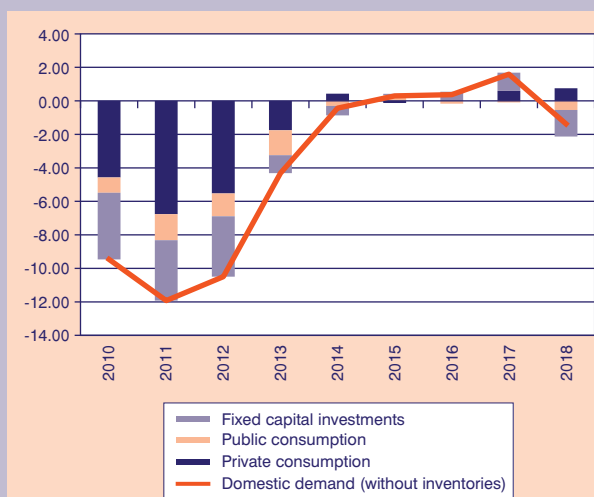
a quarterly basis, the most stable positive contribution to the growth of GDP in 2018 (with percentages from 0.5% to 1.1%). Additionally, in Figure 1.1.1a, the positive contribution of this component is recorded (0.75). On the other hand, *public consumption* in all quarters of 2018 appears with a continuous decrease (from -0.3% to -4.5%). Concerning now the Gross Fixed Capital Formation (GFCF), a contradictory evolution, between 2017 and 2018, has been recorded. More analytically, the GFCF, for 2018, recorded an average rate of -12.2% (all quarters appear with negative rates, with the exception of the 2018Q2 [19.2%]) while, during 2017, this component had a positive sign on both an annual (+9.1%) and a quarterly basis (with the exception of 2017Q2). Overall, these developments led to significant variations regarding the contribution of *domestic demand* to the rate of change of GDP growth in Greece during 2018, compared to the corresponding developments of 2017. More specifically, as presented in Table 1.1.1 and Figure 1.1.1a, *domestic demand*, from the annual increasing rate of 1.56% in 2017, turned to a reduction of 1.28% in 2018.

The external (demand) sector for 2018 presents a different trend than *domestic demand*. It actually incorporates the trade balance of goods and services. More analytically, it seems that a number of favorable exogenous factors basically associated with favourable international demand has positively influenced exports. Actually, these exports increased considerably in all four (4) quarters of the year (2018), with

rates higher than the corresponding rates of the four (4) positive quarters of 2017. On the other hand, the country's imports recorded positive, but lower, growth rates. This trend seems to be supported by the relatively good "results" in private consumption, during all of 2018 (as in 2017). Overall, these developments led to a positive growth rate of exports in 2018 (8.7%), while imports increased by 4.2%. The final result was an improvement –compared to 2017– concerning the trade balance of goods and services, as a percentage of GDP (from -1.1% to -0.26%). With regard now to the contribution of the trade balance to the rate of change of GDP, we observe the existence of a positive value of 1.34 percentage points for 2018, in contrast with the negative value of 2017 (see Figure 1.1.1b).

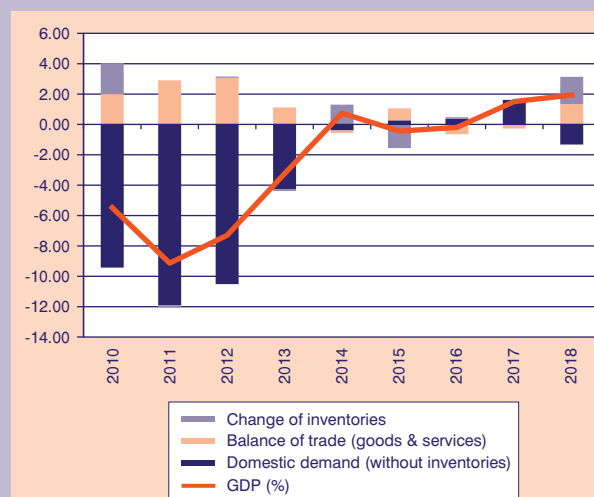
Apart from the above developments, concerning the magnitudes of *domestic demand* and the external sector, it is understood that, in 2018, there is a considerable positive contribution to the GDP growth, originating from the recorded trend of inventories. As is clear from the available data, this contribution was calculated at 1.8 percentage points. This number is very high compared to the virtually zero contribution in 2017 (see Table 1.1.1). Nevertheless, this accumulation of inventories is an indicator of a weakness concerning the adequacy of *domestic demand* to absorb the produced and the imported products. The future trend of private and public consumption as well as of the GFCF will determine the importance of these inventories for future GDP growth.

FIGURE 1.1.1a
Components of domestic and external demand



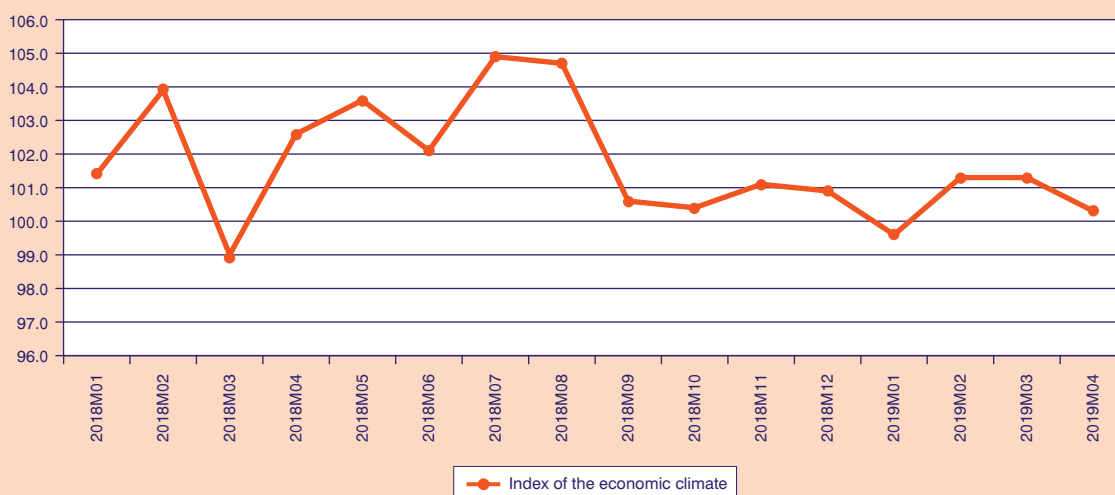
Source: National Accounts, ELSTAT, data processing by the author.

FIGURE 1.1.1b
Domestic and net external demand (components)



Source: National Accounts, ELSTAT, data processing by the author.

FIGURE 1.1.2
Index of the economic climate



Source: EUROSTAT.

Regarding the trend of the Economic Sentiment Index (ESI), as a “proxy” of future demand, it is known that, like some other leading indices, it offers valuable information from the perspectives of both business and households concerning the economy. It is also an important indicator for the economy and can be used to predict future GDP growth. As demonstrated by Figure 1.1.2, from the beginning of 2018 until now (April 2019), the ESI has been moving with an average level of 101.7 points. Even in April 2019 this index had a marginal fall to 100.3 points, compared to the reported average level (101.7 points). Overall, based on the aforementioned index, in the short run the economic situation demonstrates a slight decline as regards to business and households.

Next, a more detailed discussion follows about the contribution of the trade balance of goods and services with respect to the GDP, for 2018.

Trade Balance (goods and services)

As already mentioned above, the contribution of the external sector (exports minus imports) regarding the growth of GDP, for 2018, ends up with a positive sign and reflects mainly the importance of international demand as well as the perspectives of the international economic climate.

More specifically, we will refer separately to the rate of change of goods and the rate of change of services. Starting now from the exports, we should underline that services are relatively a smaller portion of the to-

FIGURE 1.1.3
Components of external demand



Source: National Accounts, ELSTAT, data processing by the authors.

tal exports (see Table 1.1.1), with an average annual increase of 9.3% in 2018, while goods, which are the majority of the exports, experienced an annual average growth of 8.4%. With respect now to the imports of goods and services, unlike the composition of exports, these are less balanced as a distribution. More specifically, imported services constitute only 13.5% of total imports. Additionally, imported services had a very high average annual increase rate, which was 14.4% (higher than that of 2017, which was 9.1%). As regards

now to imported goods, the average annual rate was considerably lower, at 1.1% (much lower than the corresponding rate of 2017, which was 7.1%).

Concerning now the contribution of the trade balance of goods and services to the GDP growth rate, we can report that it was formulated at 1.34 points, for 2018, in contrast to -0.21 points in 2017. More specifically, we note the positive contribution of exports to GDP growth, estimated at 2.77 points (improved by 0.72 points compared to 2017) while the (negative) contribution of imports to GDP growth was 1.44 points (minus 0.88 points compared to 2017). For the improved, compared to 2017, contribution of the trade balance of goods and services to the GDP growth of the country, much credit should be attributed to tourism receipts. The recorded higher contribution of exports than of imports, from 2016 to 2018, is also illustrated in Figure 1.1.3 where the size and trends of the corresponding histograms of imports and exports are presented.

Finally, as mentioned in the previous section, we should bear in mind that the negative trend of domestic demand in 2018, either as a contribution (-1.32 points) or as an annual rate of change (-1.28%), was actually surpassed thanks to net foreign demand (trade balance of goods and services) and the change in inventories. This sum leads to a positive GDP growth rate.

1.1.2. Private consumption and investment

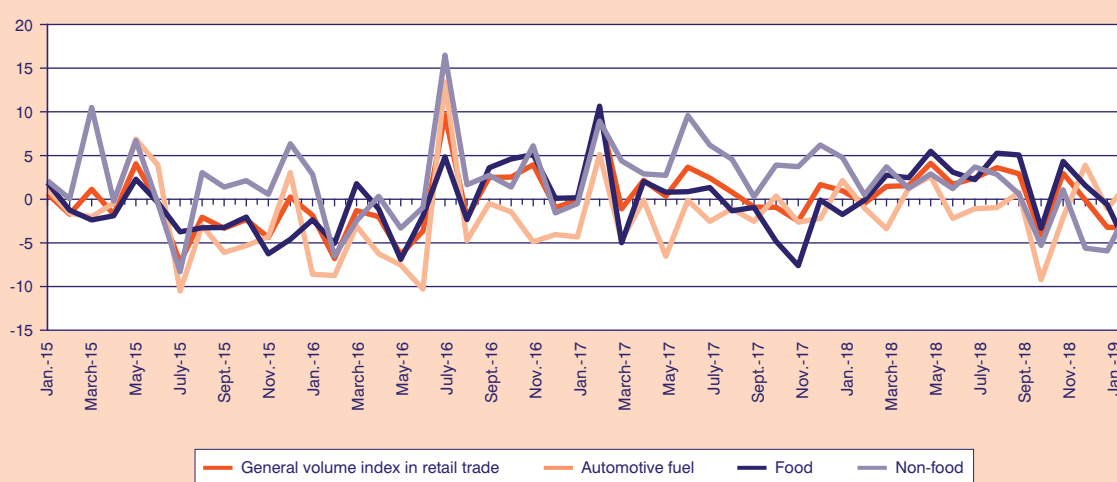
Ekaterini Tsouma

1.1.2.1. Private consumption

The *Annual and Quarterly National Accounts*, as well as a number of short-term indicators, provide important information on the recent course of private consumption. More specifically, on a quarterly basis and according to seasonally adjusted data, a standstill characterized the growth rate of private consumption during the fourth quarter of 2018 (as compared to the respective period of 2017), as the corresponding percentage change of 1.1% was identical to the one recorded in the third quarter of the year. At the same time, the data indicate a moderate enhancement of private consumption growth in the second half of 2018 (1.1%), as compared to the first half (0.9%). On an annual basis, the rate of change in private consumption for 2018 amounted to 1.1%,¹ signaling a modest improvement as compared to the rate of 0.9% for 2017. Correspondingly, private consumption contributed, in 2018, 0.8 percentage points to the GDP growth rate, recording a slight increase relative to the contribution of 0.6 percentage points in 2017.

FIGURE 1.1.4

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



Source: ELSTAT, own calculations.

1. *Annual National Accounts*, 1st estimation. This estimate is derived from the sum of the corresponding non-seasonally adjusted quarterly figures for 2018. Note that according to seasonally adjusted data from the *Quarterly National Accounts*, the rate of change in private consumption for 2018 was 1.0%, implying a marginal deviation from the above-reported growth rate. See the respective Press Release by ELSTAT, dated March 7, 2019.

Detailed information on the recent developments in the important component of private consumption is entailed in monthly data² for retail trade (Figure 1.1.4 above). More specifically, downward trends characterized the general volume index in retail trade in the last quarter of 2018, as indicated by individual rates of change per month, computed with respect to the corresponding period of 2017. In particular, the mean rate of change for the fourth quarter reached -0.4%, in contrast to the positive developments in the second (mean rate of change at 2.5%) and third (mean rate of change at 3%) quarters of the year, while the individual percentage changes for October, November and December 2018 amounted to -4.1%, 3% and -0.1%, respectively. At the same time, the mean rate of change for the whole year 2018 (twelve-month period) was 1.4% (compared to the respective 2017 twelve-month period), relative to the rate of 1.3% for 2017 (compared to the respective 2016 twelve-month period). Moreover, the available statistics concerning the course of the general volume index in retail trade in early 2019 indicate that the downward trends were not reversed, inasmuch as the respective rates of change for January and February 2019 reached -3.2% and -3.3%, respectively.

Looking at the indices for the major retail store categories, it follows that the fourth quarter of 2018 was characterized by a considerable deceleration in average increases in the category of *food* (0.9%, from 4.2% and 3.7% in the third and second quarters, respectively) and by a significant fall in the categories of *automotive fuel* (-2.5%, from -0.4% and 0.6% in the third and second quarters, respectively) and *non-food* (-3.3%, from 2.4% and 1.8% in the third and second quarters, respectively). The individual percentage changes for the months of October, November and December 2018 reached -3.3%, 4.3% and 1.6%, respectively, in the *food* category; -9.2%, -2.1% and 3.9%, respectively, in the *automotive fuel* category; and -5.3%, 1.1% and -5.6%, respectively, in the *non-food* category. In combination with the course of the referred indices during the first nine months of 2018, the mean rate of change for the whole year 2018 (twelve-month period) was 2.3% in the *food* category (compared to the respective 2017 twelve-month period), relative to the rate of -0.3% for 2017 (compared to the respective 2016 twelve-month period), thus recording a significant improvement; -0.8% in the *automotive fuel* category (compared to the respective 2017 twelve-month period), relative to the rate of -1.8% for 2017 (compared to the respective

2016 twelve-month period), thus recording a moderation of the downward course; 1% in the *non-food* category (compared to the respective 2017 twelve-month period), relative to the rate of 4.4% for 2017 (compared to the respective 2016 twelve-month period), thus recording a non-negligible slowdown in the upward path. In addition, the aforementioned overall negative trends recorded in early 2019 in the retail trade sector are further reflected in the developments of the three basic retail store categories, with the corresponding rates of change for January and February,³ as compared to the respective months of 2018, amounting to -0.6% and -5.9%, respectively, in the *food* category, -1.1% and 2.0% in the *automotive fuel* category and -5.9% and -0.9% in the *non-food* category.

More thorough evidence on the recent conditions in retail trade is obtained on the basis of the developments recorded in the individual volume indices in the store sub-categories. In particular, positive trends, as compared to 2017, characterized the whole year 2018 (based on the twelve-month period mean rate of change) only in the *supermarkets* category (3.5% from 0.8% in 2017), while negative trends attenuated somewhat in the *food-beverages-tobacco* category (-3.1% from -3.3% in 2017). In all the remaining store categories, a more or less broad weakening of positive trends was observed (0.3% from 2.1% in 2017 in the *pharmaceutical products-cosmetics* category, 1.3% from 3.3% in 2017 in the *clothing and footwear* category, 5.1% from 5.9% in 2017 in the *furniture-electrical equipment-household equipment* category, and 2.2% from 8.1% in 2017 in the *books-stationery-other goods* category), while in the *department stores* category there was a changeover from an increasing course in 2017 to a decreasing one in 2018 (-0.3% from 0.4%). In terms of percentage changes in the volume indices per month, relative to the respective month of the previous year, positive developments were recorded in November 2018 in the store categories of *supermarkets* (5.3%), *clothing and footwear* (3.1%), *furniture-electrical equipment-household equipment* (6.9%) and *books-stationery-other goods* (9.3%) and in December 2018 in the categories of *supermarkets* (1.3%), *food-beverages-tobacco* (4.1%) and *clothing and footwear* (4.3%). At the same time, the most notable single negative percentage changes were recorded during the referred two months in the store categories of *department stores* (-8.1% in November and -2.9% in December), *pharmaceutical products-cosmetics* (-13.4% in December) and in the *books-stationery-other goods*

2. On a non-seasonally adjusted basis.

3. Provisional data.

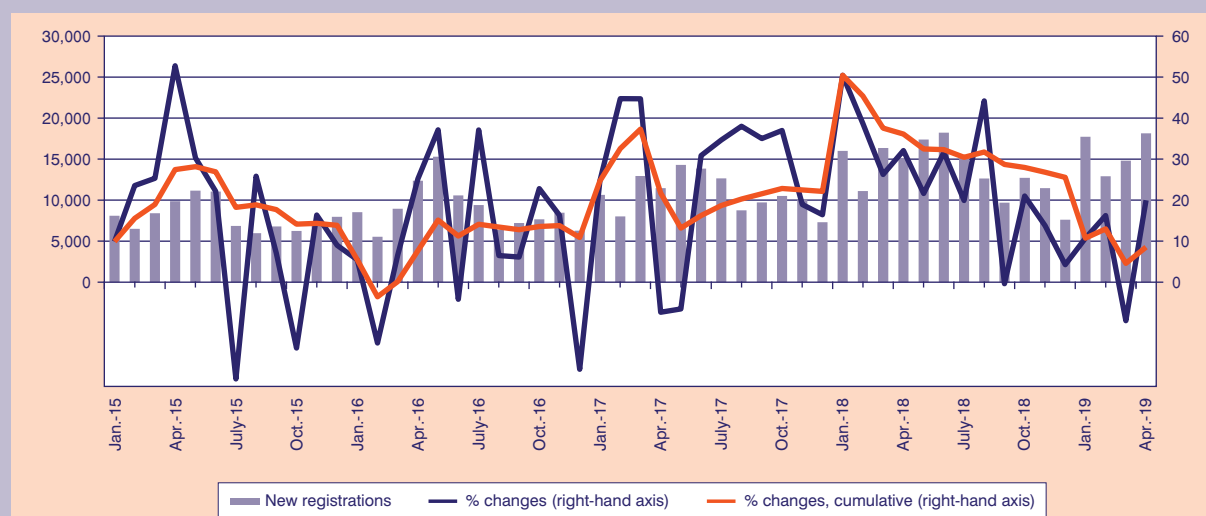
category (-2.4% in December). Moreover, the volume index in the store category *books-stationery-other goods* was the only one that recorded positive –and double-digit– rates of change in the first two months of 2019⁴ (11.2% in January and 14.4% in February), whereas the developments in all the other volume index sub-categories were unfavourable, with significant, and in several cases double-digit, negative rates of change, as for example in the categories of *department stores* (-14% in January and -6.1% in February), *pharmaceutical products-cosmetics* (-9% in January and -6.1% in February) and *clothing and footwear* (-13.1% in January and -4.1% in February).

Additional evidence on the course of private consumption in terms of monthly indicators is provided by the statistics with regard to the issuing of licenses for passenger cars (new and used) (Figure 1.1.5). On the basis of cumulative⁵ rates of change, 2018 was characterized by a positive double-digit percentage change of 25.6% for the twelve-month period, slightly above the respective twelve-month cumulative rate of change of 22.1% for 2017. On the basis of individual monthly percentage changes in licenses issued, relative to the corresponding months of the previous year, favourable developments were recorded in the last three months of 2018, including a certain weakening in December (21% in October, 13.8% in Novem-

ber and 4.2% in December) and an overall moderating trend, as compared to the respective changes in 2017 (37% in October, 18.9% in November and 16.4% in December). At the same time, in early 2019 passenger car new registrations continued to record double-digit increases –except for the decrease of -9.4% recorded in March– amounting to 10.7% in January, 16.2% in February and 20% in April. However, compared to the corresponding (relative to 2017) percentage changes which had been recorded in early 2018 (50.4% in January, 38.7% in February, 26.3% in March and 32.1% in April), positive dynamics in the number of licenses issued seem to have weakened, as is further reflected in the cumulative rates of change for the first four months of 2019, during which single-digit rates of change were recorded for the first time since early 2016. More specifically, the respective cumulative changes amounted to 10.7%, 13%, 4.6% and 8.5% in the months of January, February, March and April, respectively (relative to the changes of 50.4%, 45.4%, 37.6% and 36.1% recorded during the corresponding months of 2018).

All the above evidence on the developments in private consumption, alongside the trends in the relevant individual indicators, demonstrate that the respective major GDP component continued to contribute decisively to GDP growth during 2018, by recording an overall favourable course. At the same time, its path seems

FIGURE 1.1.5
New passenger car registrations



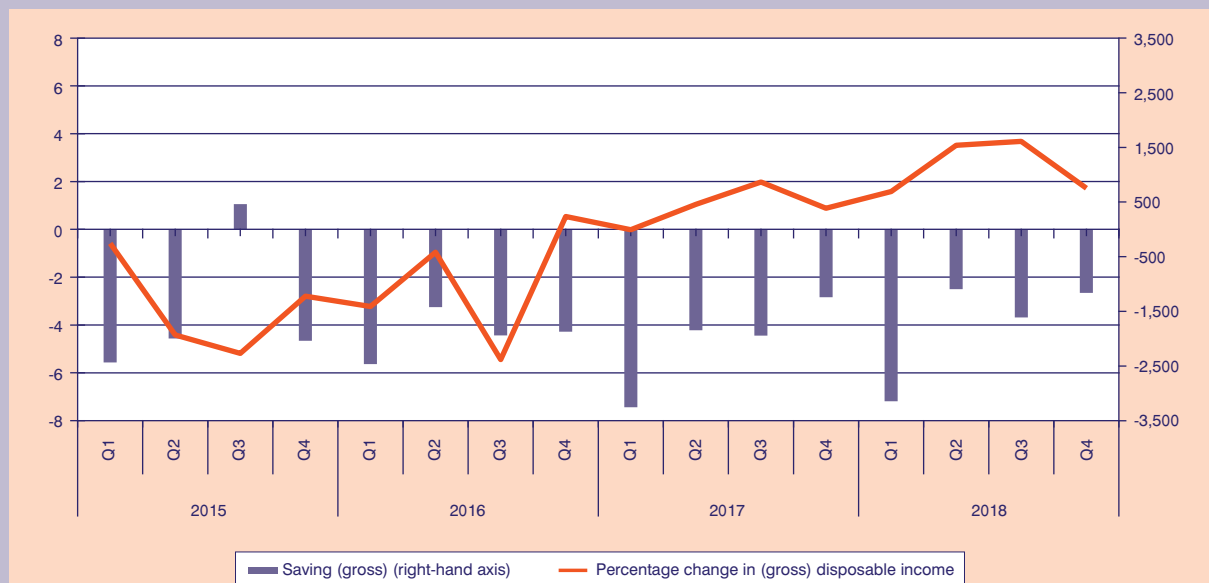
Source: ELSTAT, own calculations.

4. Whereby data for February are provisional.

5. Cumulative monthly changes are calculated as percentage changes, as compared to the corresponding period of the previous year, whereby for each month new registrations are summed up starting from the beginning of the year.

FIGURE 1.1.6

Saving (gross, million €) and percentage change in household and NPISH (gross) disposable income



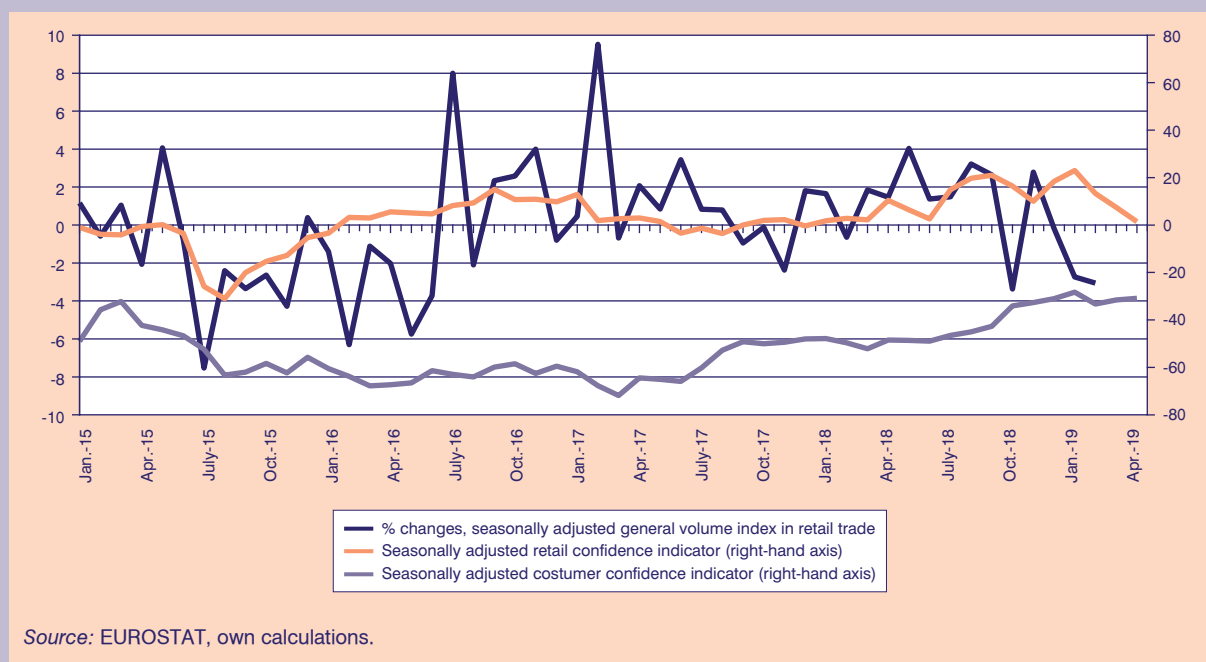
Source: ELSTAT, own calculations.

to have been characterized by a lack of additional dynamics and, in particular, by a restraint tendency in the last quarter of 2018. This ascertainment is consistent with the recent developments in household and non-profit institutions serving households (NPISH) (gross) disposable income and with the developments in (gross) saving (Figure 1.1.6). More specifically, after the increase in disposable income by 3.7% in the third quarter of 2018 (as compared to the same quarter in 2017), which was particularly favourable for the course of private consumption, the relatively moderate rise by 1.7% in the last quarter of 2018 appears to have affected the analyzed macroeconomic component towards the same direction. Moreover, household (gross) saving continued as a whole to move in negative territory in 2018 and, once again, remained depressed in the last quarter of the year, albeit moderating both in absolute terms and as a percentage of household income. The referred conditions did not allow households to appropriately expand their consumption expenditure, while they may have at the same time created greater financial restraints during periods in which households were facing higher or at least accumulated financial burdens.

In this context, great importance is ascribed to the assessment of the prospects for private consumption in the near future. Some first indications from available monthly data, which reflect certain aspects of private

consumption expenditure, suggest as a whole that any positive developments are not expected to be accompanied by a remarkable enhancement in the dynamics of the referred key macroeconomic component right away. In contrast, the evidence implies a reluctance and a wait-and-see stance, depending on the conditions characterizing disposable income, and especially the compensation of employees, but also on any additional financial burden or relief households will face in the short run. Business expectations in retail trade appear to be formed according to this line of argument, as indicated by the most recent course in the retail trade confidence indicator (Figure 1.1.7). More specifically, following the increase registered in January 2019 (at the level of 23), the respective indicator recorded three consecutive decreases (to 13.3 in February, 7.4 in March and 1.4 in April), reflecting the attenuation of any positive assessments by businessmen concerning the short-term prospects in the respective sector. In parallel, domestic households remained overall quite pessimistic, as evidenced on the basis of the consumption confidence indicator that, in early 2019, continued to move around the level of -31, which was recorded in December 2018. Still, it is worth noting that the most recent path of the respective indicator implies a tendency towards a softening of the, as a whole, quite adverse consumer sentiment (the indicator has continued to improve since July 2018, with the excep-

FIGURE 1.1.7
Volume index in retail trade and confidence indicators



tion of its intermediate worsening in February 2019) (Figure 1.1.7).

1.1.2.2. Investment

Significant information on the recent developments in investment on an overall basis and in terms of individual asset categories is derived from the *Quarterly* and the *Annual National Accounts*. On a quarterly basis, and according to seasonally adjusted data, a huge decline characterized the respective macroeconomic component, following the drastic decrease in investment in the third quarter of 2018. More specifically, gross fixed capital formation fell by -27.2% in the last quarter of 2018, as compared to the corresponding quarter of 2017. On an annual basis, the rate of change in investment expenditure amounted to -12.2% in 2018,⁶ implying a remarkable deterioration relative to the rate of 9.1% that was recorded in 2017. Correspondingly, investment expenditure contributed negatively to the GDP growth rate by -1.6 percentage points, contrary to its positive contribution of 1.1 percentage points in 2017.

Resorting to the individual categories of investment expenditure (Figure 1.1.8), it becomes obvious that

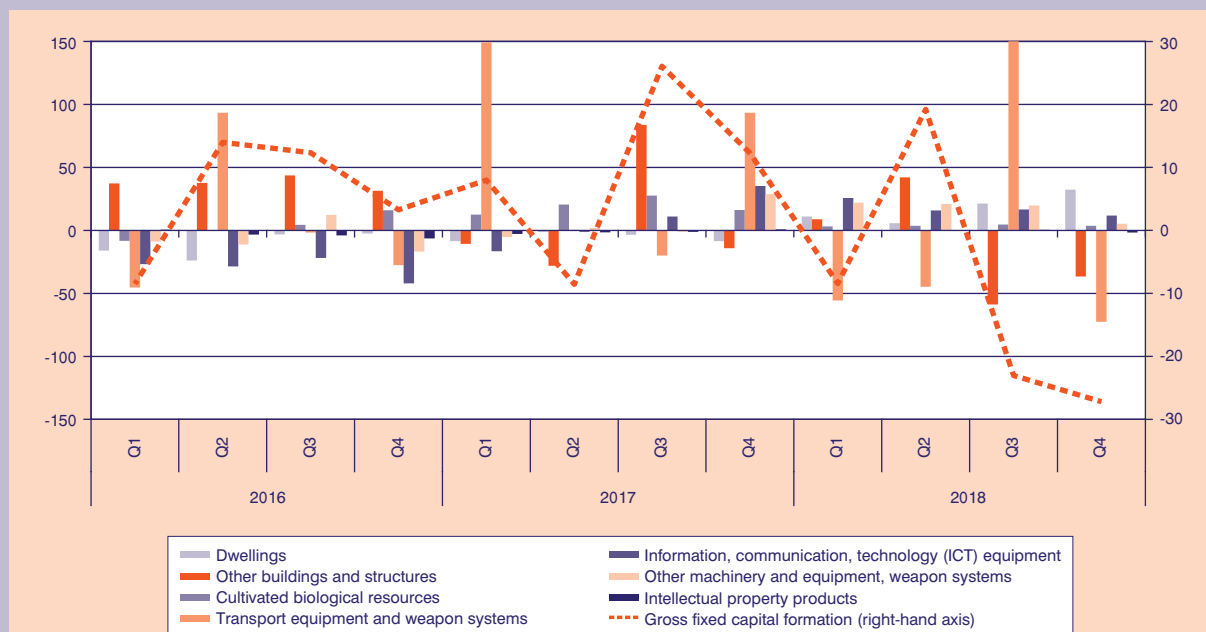
the adverse developments were mainly driven by the immense fall recorded during the fourth quarter of 2018 in the asset categories of *other buildings and structures* (-36.5%) and *transport equipment and weapon systems* (-72.5%). Among the remaining categories, decreasing trends further characterized investment expenditure for *intellectual property products* (-1.7%). As a result, central to the above described developments in gross fixed capital formation were asset categories from within, but also outside, the construction category. In parallel, a rise was recorded in the fourth quarter of 2018 in investment expenditure for *dwellings* (32.3%), *cultivated biological resources* (3.6%), *information-communication-technology (ICT) equipment* (11.8%) and *other machinery and equipment, weapon systems* (5.3%). The reported positive evolution of investment expenditure for *dwellings* confirms the recovery in the corresponding asset category during 2018, following a particularly prolonged period of depression. All the referred developments are evidently reflected in the corresponding figures on the contribution of the individual asset categories to the GDP growth rate. In particular, the above mentioned overall negative contribution of gross fixed capital formation was basically driven by the individual negative contri-

6. This estimate is derived from the sum of the corresponding non-seasonally adjusted quarterly figures for 2018. Note that according to seasonally adjusted data from the *Quarterly National Accounts*, the rate of change in gross fixed capital formation for 2018 was -12%, implying a marginal deviation from the above reported growth rate. See the respective Press Release by ELSTAT, dated March 7, 2019.

FIGURE 1.1.8

Main asset categories

Percentage changes in seasonally adjusted chain-linked volumes



Source: ELSTAT, own calculations.

butions of the *other buildings and structures* and the *transport equipment and weapon systems* categories, at -1.2 and -1.1 percentage points, respectively. The positive contributions by the *dwellings* (0.1), *information-communication-technology (ICT) equipment* (0.1) and *other machinery and equipment, weapon systems* (0.4) asset categories did not provide sufficient counterbalancing factors.

The deterioration in the construction –except for dwellings– sector is confirmed by the most recent quarterly data for the production of civil engineering indicator, which constitutes a sub-category of the general production index in construction. More analytically, according to the respective indicator⁷, covering construction works such as highways, roads, airports, sports facilities, bridges, pipelines, networks and port works, among other things, the production of civil engineering declined by -7.3%⁸ in the fourth quarter of 2018, as compared to the respective quarter in 2017. It is worth noting that the indicator for the other sub-category, namely the production of building construction, which incorporates construction of dwellings, offices,

hotels, industrial and commercial buildings and other residential buildings, among other things, increased by 13.3% in the same quarter. In parallel, the participants in the construction sector remained pessimistic as to the expected developments, as indicated by the recent course of the construction confidence indicator, which mirrors the corresponding assessments (Figure 1.1.9). More specifically, the respective indicator continued to exhibit a significant degree of variability, with the overall negative monthly levels, recorded from December 2018 to April 2019, alternating between deterioration and intermediate improvement (-53.1 in December 2018, -51.3 in January 2019, -61.3 in February, -48 in March and -49.5 in April).

At the same time, and in line with *National Accounts* statistics for investment in dwellings, the evidence provided by the indicator⁹ for residential buildings as to the square meters of useful floor area, based on building permits issued, implies that 2018 was characterized by particularly favourable developments in the respective sector. More specifically, according to both the individual monthly indicator data and the course

7. Non-seasonally and non-working day adjusted data.

8. Provisional data.

9. On a non-seasonally adjusted basis.

FIGURE 1.1.9
Construction confidence indicator

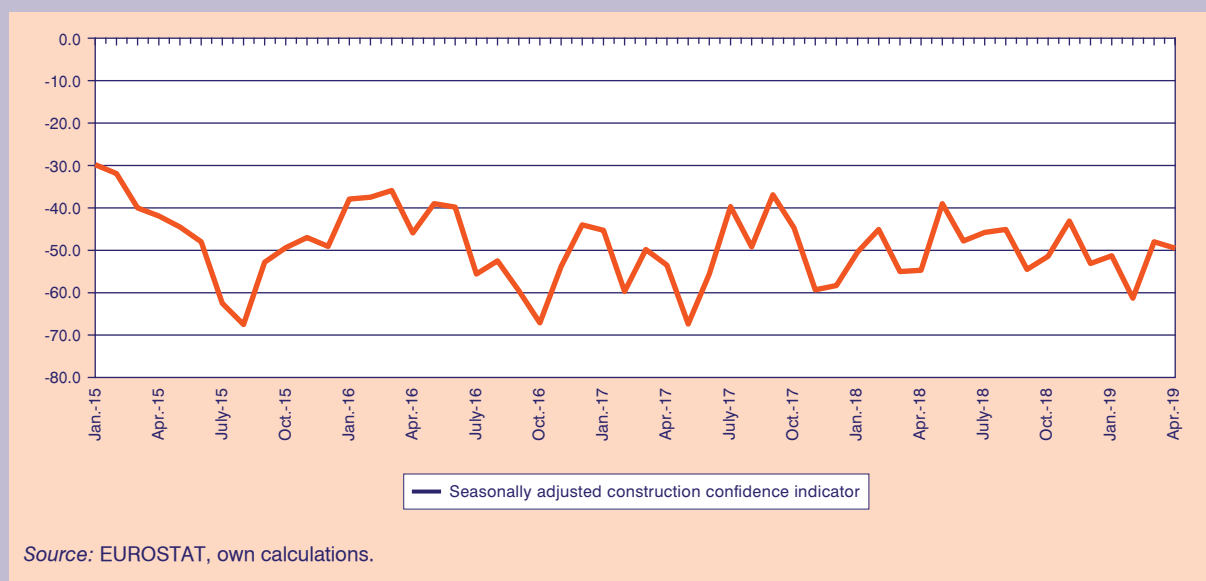
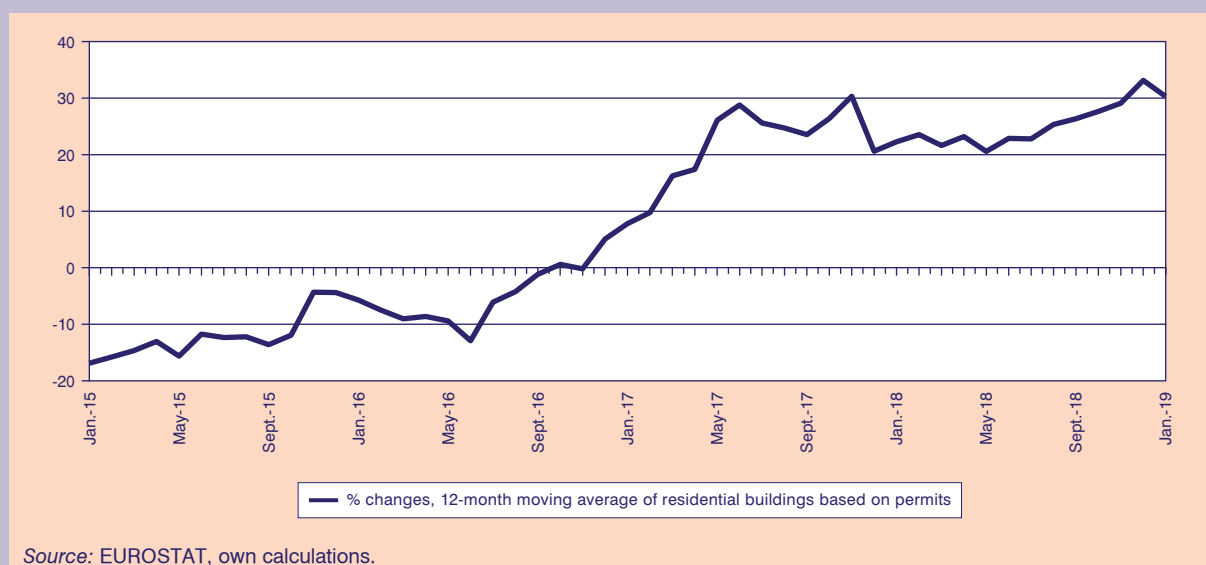


FIGURE 1.1.10
Estimated residential building activity based on permits



of the estimated private building activity¹⁰, the positive environment observed during the preceding period of reference was preserved. The monthly rates of change, as to the corresponding periods of the previous year, of the residential buildings indicator amounted in October, November and December 2018 to 50.5%, 52.3% and 8.3%, respectively, while the percentage changes in the estimated building activity in the same months

was 27.6%, 29.1% and 33.1%, respectively (Figure 1.1.10). It is worth mentioning that, according to the last available observation for January 2019, the residential buildings indicator recorded a marginal decline (rate of change of -0.7%, as compared to January 2018). This fact, if combined with the relatively modest increase recorded in December 2018, could constitute a sign in favour of a containment tendency characterizing

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

the recovery process in the referred sector, or it could potentially represent a conjunctural signal, on the basis of a variability feature exhibited by the indicator, given that the estimated building activity continues to move around high levels in early 2019 (rate of change of 30.3%).

1.1.2.3. Conclusions

Taking into account the entire information and all the indications as presented in the above with regard to the macroeconomic components of private consumption and investment, several general conclusions emerge. Concerning private consumption, it follows that the respective domestic demand component exhibits a tendency toward stability, which could also be interpreted as a lack of additional dynamics. This ascertainment referring to the positive, but still moderate, course in private consumption is consistent with: the overall economic conditions prevailing in the country, given that a broad stabilization in the major macroeconomic aggregates has been achieved as well as the developments in the labour market and the potential impact of the electoral cycle; and the delays in the implementation of economic measures that could initiate financial relief from the significant burdens and liabilities domestic households have been facing, and the relative

uncertainty arising from the ambiguity with respect to the economic policy to be implemented after the elections.

Regarding investment, it follows that this specific key component of domestic demand continues to be characterized by significant fluctuations. Taking into account its recent remarkable deterioration, it does not seem to provide the absolutely necessary positive contribution to the growth process of the country on a regular basis, something that constitutes a prerequisite for safeguarding the sustainability of the economic recovery process in order for the economic system to be able to preserve the existing jobs and create new ones. Any improvement of the conditions for boosting investment in the country is intertwined, on the one hand, with crucial factors such as business financing and liquidity provision within the framework of smoothly operating domestic commercial banks. On the other hand, it is linked to the creation of a safe and stable environment to attract investors and promote the implementation of huge investment projects, which are key to the enhancement of economic activity in sectors such as construction. This environment, however, was not particularly favoured in the more recent conjuncture, in view also of the electoral periods within 2019, potentially catching economic agents in a situation of reluctance and a wait-and-see stance.

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

Yannis Panagopoulos

Greece

The Greek headline Consumer Price Index (CPI), from October 2018 to March 2019, follows a relative low trend, which is less than 1.0% annually (see column of Table 1.2.1 and Figure 1.2.1). Additionally, the core¹ of the CPI presents a similar trend during this period. More specifically, the core of the CPI has moved between 0.1% up to 0.6%.

A similar trend was recorded by the Greek harmonized CPI (HCPI) and its core. The only difference between the two cores (HCPI and CPI) is that the rate of the former was a bit higher than the latter. Note that the observed convergence to the same rate of change (0.6%, see Table 1.2.1), in December 2018, was rather an outlier.

Additionally, according to the Hellenic Statistical Authority (ELSTAT), the aforementioned headline inflation rate (0.9%, y-o-y, in March 2019) can be mainly attributed to subsequent price increases in seven (7) main sub-categories, namely:

- (a) the “Communication” category (by 6.9%) mainly due to increased fees of telephone services,
- (b) the “Transportation” category (by 2.3%) mainly due to price increases in vehicle fuels and lubricants as well as transport airplane tickets,
- (c) the “Housing” category (by 1.8%) due to price increases in residential heating and natural gas,
- (d) the “Food and non-alcoholic beverages” category (by 1.4%), due to price increases mainly in bread and corn, beef, fresh fish, pork, fresh milk, fresh vegetables and potatoes. Part of this increase was offset by decreases in the prices of poultry, lamb, yogurt, cheese, olive oil, fresh fruits, frozen vegetables and sausages,
- (e) the “Alcoholic, drinks and tobacco” category (by 1.3%) basically due to price increases in tobacco,
- (f) the “Health” category (by 1.1%) especially due to price increases in pharmaceutical products,

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 (EU 19)	Core Harmonized inflation (EU 19)
2018M9	1.1	0.1	1.1	0.4	2.1	1.1
2018M10	1.8	0.3	1.8	0.7	2.2	1.2
2018M11	1.0	0.1	1.1	0.5	1.9	1.1
2018M12	0.6	0.6	0.6	0.6	1.6	1.1
2019M1	0.4	0.3	0.5	0.4	1.4	1.2
2019M2	0.6	0.2	0.8	0.5	1.5	1.2
2019M3	0.9	0.4	1.0	NA	NA	NA

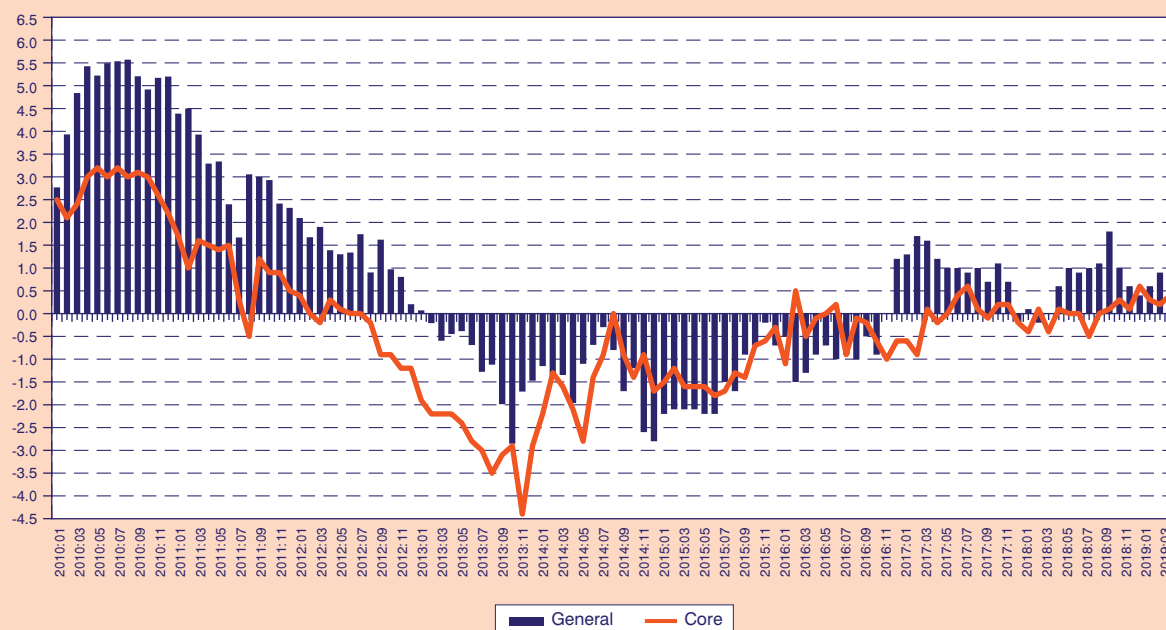
Source: ELSTAT, EUROSTAT.

Note: NA: No available data.

1. The core does not contain the prices of electricity, natural gas and automobile petrol.

FIGURE 1.2.1

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



Source: ELSTAT.

- (g) the “Restaurants-Hotels-Cafés” category (by 0.5%) mainly due to the price increases in restaurants, motels, hotels & cafés.

Part of the aforementioned inflation rate was offset by the decrease mainly in the prices of five (5) sub-categories, namely:

- (a) the “Clothing and Footwear” category (by 3.5%) due to price decreases of these products,
- (b) the “Recreation and culture” category (by 1.7%) mainly due to decreases in the prices of optical and visual equipments, PCs and other repairs,
- (c) the “Household equipments & services” category (by 1.4%) mainly due to decreases in prices of furniture and decoration items, household textile products and household equipments,
- (d) the “Education” category (by 0.8%) mainly due to reductions in the fees for secondary schools,

- (e) the “Miscellaneous goods and services” category (by 0.5%) basically due to reductions in the prices of personal care products, other personal items and vehicle insurance.

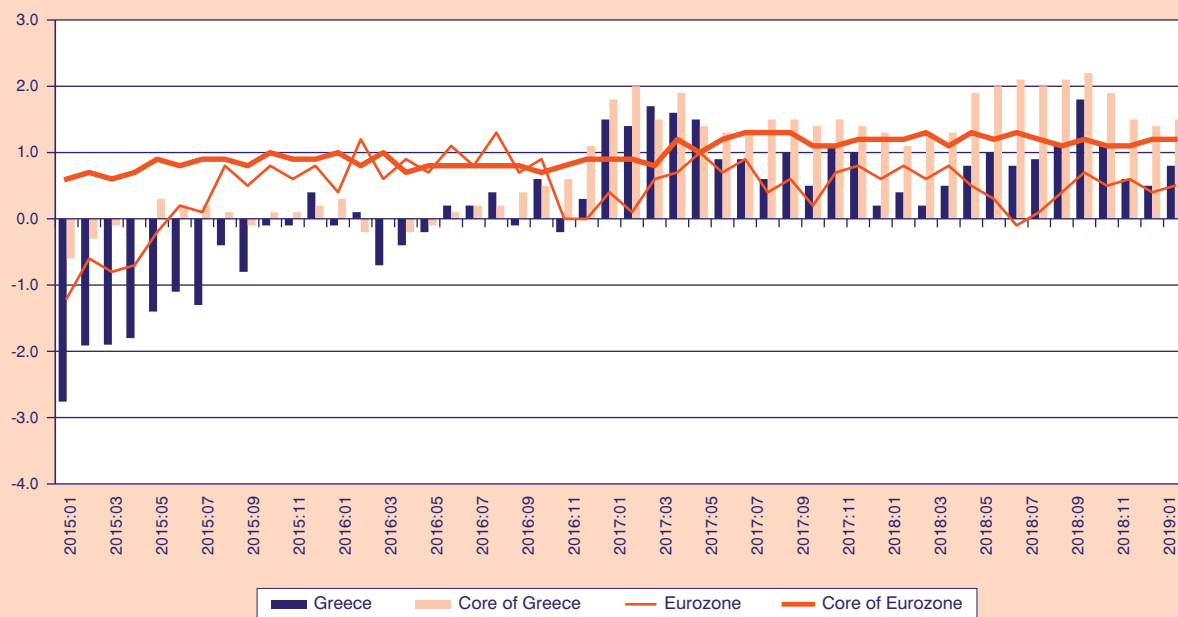
The Eurozone

As regards the change of the harmonized CPI of the euro area (HCPI-EU19), we can report that, from October 2018 up to March 2019, the HCPI-EU19 fell short of reaching the target/objective of the European Central Bank (ECB)² (see Figure 1.2.2). At the same time, the core of the HICP-EU19 continues to move steadily with positive rates of around 1.1%-1.2%. Regarding now the issue of convergence between the rate of change of HCPI of both the Eurozone and Greece, during the aforementioned time period, it is observed that their difference was steady around 0.8%-1.0%. For the corresponding core indicators, this difference is even smaller and ranges between 0.5% and 0.8%.

2. The target of the ECB for the HCPI-EU19 is a percentage change of 2.0%.

FIGURE 1.2.2

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



Source: ELSTAT, EUROSTAT.

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 2019.¹ The forecasts are produced by implementing a dynamic structural factor model, a detailed description of which can be found in Issue 15 (June 2011, pp. 19-20) 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 2018. 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) GDP data up to the end of 2018, the mean annual rate of change of real GDP for 2019 is predicted at 1.8%. This forecast reflects a marginal weakening in growth as compared to the previous year, since the respective real GDP rate of change for 2018 was 1.9%.³ The corresponding mean rates of change for the first and second half of 2019, as compared to the same periods of 2018, are estimated at 1.9% and 1.6%, respectively, indicating: first, a downward revision of the preceding factor model forecast for the first half of 2019 (2.2%) and, second, a trend towards a moderate fading of the growth process in the country during the second half of 2019. This trend is further mirrored in the estimated quarterly growth rates for the four quar-

TABLE 1.3.1 Real GDP rate of change for 2019 (% , y-o-y)

	2019			
Quarters	2019Q1	2019Q2	2019Q3	2019Q4
Quarterly rate of change	1.97 [1.91 , 2.03]	1.87 [1.75 , 1.98]	1.24 [1.07 , 1.40]	1.98 [1.76 , 2.20]
Mean rate of change, 1 st & 2 nd half of 2019	1.92 [1.83 , 2.00]		1.61 [1.41 , 1.80]	
Mean annual rate of change	1.76 [1.62 , 1.90]			

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

1. The date of the forecast is the 15th of May 2019.

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

3. According to statistics by ELSTAT, based on the first estimation of the *Annual National Accounts* for 2018.

ters of 2019, at 2%, 1.9%, 1.2% and 2%,⁴ as compared to the corresponding quarters of 2018.

According to the above presented estimates of the rate of change of real GDP, it follows that growth in 2019 will settle at levels similar to the ones recorded in 2018, demonstrating a fairly stable economic outlook, but also a lack of additional growth dynamics. More specifically, restrained growth dynamics in the last quarter of 2018 (1.6%, as compared to the last quarter of 2017, following the rate of 2.1% in the third quarter) are expected to be carried over to 2019, leading to a gradual slowdown in growth rates up to the third quarter and to a significant rebound at the end of the year. As a result, recovery and stability conditions are anticipated to continue to prevail in the Greek economy, alongside a more contained growth path, mainly due to the course of domestic demand. The observed absence of indications on a further enhancement of growth within 2019 could mirror delays in the progress made with reference to the completion and implementation of major projects and investments, as well as additional key structural reforms. Moreover, it could reveal a reluctance and wait-and-see stance by economic agents related to the two election periods taking place in 2019. In addition, it may reflect the recently downward revised economic prospects at the European and international levels, in combination with the conditions of escalating uncertainty which appear to prevail globally, affecting the growth outlook in major economies worldwide, with potential effects on the domestic economic environment.

The above findings and assessments seem to be in line with the recent course of the major GDP components and of a number of other economic variables, as indicated by the non-seasonally adjusted economic data for the last quarter of 2018, as compared to the same quarter of 2017. In particular, with respect to favourable developments in GDP components, private consumption expenditure recorded an increase, even though it remained relatively weak (positive rate of change below unity), accompanied by the remarkably positive course of goods and services exports. In parallel, economic activity in industry was characterized by rising trends, according to: (a) the general industrial production index and the indices of the individual categories, with the exception of those for durable consumption goods and capital goods, which decreased,

(b) the general turnover index and the sub-indices in industry for the overall as well as for the internal and external markets, with the exception of the sub-index for durable consumption goods, which recorded a fall (in the case of the external market, the sub-index for capital goods decreased as well) and (c) the index for new orders in recent months. A rising course further characterized: (a) travel and transport receipts, (b) passenger cars, according to passenger car licenses issued and the turnover index for motor trade (wholesale, retail trade and repair of motor vehicles, etc.), (c) building activity, in terms of volume, on the basis of permits issued, (d) wholesale trade, on the basis of the turnover index and (e) the general production index in construction, on the basis of the increase in the sub-index of production of building construction (in contrast to the downward course of the sub-index of production of civil engineering). At the same time, positive developments were recorded with regard to spreads (the difference between Greek and German 10-year bonds), which declined compared to the respective quarter of 2017. Encouraging signs were also provided by: (a) a number of indicators reflecting business expectations on a sectoral level, namely for retail trade and construction, (b) the indicator for export expectations and (c) the economic sentiment indicator for Greece. Moderate improvements were also recorded for a number of competitiveness indicators.

On the positive side and of great importance for domestic economic conditions, was the continuation of the gradual reduction in unemployment (on an aggregate level, as well as for the long-term and the newly unemployed), alongside the preservation of the increasing trend in employment (on an aggregate level, and in the primary, secondary and tertiary sectors as well), despite the overall adverse situation still characterizing the domestic labour market.

On the negative side,⁵ the heavy setback in the major macroeconomic component of investment played a central role, driven by the particularly adverse developments in the categories of *other buildings and structures* and *transport equipment and weapon systems*. In parallel, a downward course characterized public investment, the general volume index in retail trade and all the indices of the corresponding individual categories, and the General Index of the Athens Stock Exchange, while the assessments on anticipated or-

4. It is noted that, due to the structure of the employed model, no assessment can be made on any potential impact arising from the recent implementation of policy measures, such as the ones concerning the increase in the minimum wage, the pension bonus and the changes in tax rates.

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

ders in industry and exports, as well as business expectations in manufacturing, worsened. Finally, there was a significant deterioration of the economic climate indicator for the European Union (EU).

Greek real GDP and the overall domestic economic environment may evolve according to a more or less favourable scenario –than indicated by the above presented forecasts– depending on certain critical and decisive developments concerning a wide range of factors. These are associated with the course of the major GDP components: the strengthening of private consumption, the absolutely necessary recovery in investment and the preservation of a favourable environment with regard to exports. Such conditions are necessary in order to safeguard the viability of the growth process and the reinforcement of production capacity in crucial sectors of the Greek economy,

with the aim to create new and sustainable jobs. The referred factors also concern the compliance with the commitment to preserve balanced fiscal aggregates and to continue with the implementation of all necessary structural reforms. At the same time, in the current conjuncture, these factors are linked to the duration and any potential positive and/or negative impact of the electoral cycle and the related expected political developments, creating an environment of uncertainty or, at least, a reluctance and wait-and-see attitude. Clearly, both the dynamics of the growth process at the global and European level and the overall international developments are crucial to the evolution of domestic economic conditions towards a more or less favourable direction, whereas issues concerning, for example, world trade, immigration and Brexit negotiations are expected to acquire great significance.

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

Aristotelis Koutroulis

The growth rate of the global economy is expected to slow significantly in 2019. Growth deceleration is clearly evident in advanced countries. On the contrary, most developing and emerging economies appear to maintain growth momentum. Meanwhile, protectionist tensions continue to weigh down on global trade activity.

1.4.1. Trends and developments in the global economy

Economic activity

Although economic expansion remains robust in major economies (the US, India and China), global GDP growth rates appear to follow a downward trend. To some extent, the slowdown of the global economy reflects the increased tensions in US-China trade relations, the economic recessions in Argentina and Turkey, the deterioration of the business climate in major manufacturing sectors, weak investment rates, and the high uncertainty that prevails among households, firms and international investors.

Overall, the annual growth rate of global GDP is projected to decline by 0.3 percentage points this year before returning to 2018 levels in 2020 (see Table 1.4.1). However, global GDP growth might slow further than expected as the balance of risks continues to be on the downside. Negative risks include an escalation of geopolitical tensions, rising trade protectionism, an abrupt slowdown of the Chinese economy, a no-deal Brexit, and the financial vulnerability of highly indebted states (European Commission, 2019; IMF, 2019; OECD, 2019; UN, 2019).

Inflation and unemployment

Advanced economies have been experiencing a lengthy period of low inflation rates. Over the course of 2019, inflation is set to slow further, by 0.4 percentage points on average, reflecting weak economic activity

and low increases of energy products and other commodities prices (see Table 1.4.2). The average inflation rate is expected to return to 2018 levels by 2020. With low inflation expectations and actual inflation lying below central bank targets, monetary policy is expected to remain supportive.

In most developing and emerging economies, inflationary pressures remain contained. An exception to this general pattern is formed by recent inflation hikes in Argentina and Turkey as both countries experienced strong currency devaluations (OECD, 2019). Looking ahead, inflation rates in developing and emerging economies are projected to register only marginal changes (see Table 1.4.2).

Regarding employment, the International Labor Organization (ILO) projects that the rate of global unemployment will register a marginal decrease this year and settle at 4.9% (see Table 1.4.3). This indicates that a very large majority of the world's workforce enjoys employment status. In absolute terms, however, the same figure suggests that 173.6 million people around the world who are looking for employment opportunities cannot find a job. Moreover, according to ILO estimates, job quality characteristics and rewards differ a lot, both within and across countries. The most striking difference is related to wage discrepancies, with one in four workers across the globe living in extreme or moderate poverty (ILO, 2019).

In the advanced world, labor market conditions show signs of improvement as both employment rates and wages are on the rise (OECD, 2019). Nevertheless, for countries suffering double-digit unemployment rates like Greece, Italy and Spain, the current job-creation rates are highly unlikely to bring unemployment to a tolerable level within the next two years.

1.4.2. Economic developments across the globe

Advanced economies

Over the current and the next year, the average rate of economic growth in developed economies is expected to decline to 1.8% (see Table 1.4.1). According to the IMF, this decline explains two-thirds of the slowdown in global economic expansion. With the reduction of production gaps and with many developed economies running very close to their production potential, it is estimated that actual economic growth will keep up with the milder growth rates of potential GDP in the medium term.

TABLE 1.4.1 Real Gross Domestic Product^{1,2}
(annual percentage changes)

	2018*				2019**				2020**			
	IMF	EC	OECD	UN	IMF	EC	OECD	UN	IMF	EC	OECD	UN
World economy	3.6	3.6	3.5	3.6	3.3	3.2	3.2	3.3	3.6	3.5	3.4	3.6
Advanced economies	2.2	;	;	2.2	1.8	;	;	1.8	1.7	;	;	1.8
USA	2.9	2.9	2.9	2.9	2.3	2.4	2.8	2.3	1.9	1.9	2.3	2.1
Euro Area	1.8	1.9	1.8	1.8	1.3	1.2	1.2	1.4	1.5	1.5	1.4	1.6
Japan	0.8	0.8	0.8	0.8	1.0	0.8	0.7	0.8	0.5	0.6	0.6	1.0
United Kingdom	1.4	1.4	1.4	;	1.2	1.3	1.2	;	1.4	1.3	1.0	;
Developing economies	4.5	;	;	4.3	4.4	;	;	4.1	4.8	;	;	4.5
Brazil	1.1	1.1	1.1	1.1	2.1	1.9	1.4	1.7	2.5	2.4	2.3	2.3
Russia	2.3	2.3	2.3	2.3	1.6	1.5	1.4	1.4	1.7	1.8	2.1	2.0
India	7.1	7.4	7.0	7.2	7.3	7.1	7.2	7.0	7.5	7.3	7.4	7.1
China	6.6	6.6	6.6	6.6	6.3	6.2	6.2	6.3	6.1	6.0	6.0	6.2

Sources: IMF, *World Economic Outlook Update*, April 2019; OECD, *OECD Economic Outlook*, May 2019 (Preliminary version); European Commission, *European Economic Forecast*, Spring 2019; United Nations, *World Economic Situation and Prospects* as of mid-2019.

* Estimations, ** Projections.

Notes: 1. The observed differences between the available macroeconomic projections partly reflect the differences between the macro-econometric 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 Inflation¹
(annual percentage changes)

	2018			2019*			2020*		
	IMF	EC	OECD	IMF	EC	OECD	IMF	EC	OECD
Advanced economies	2.0	:	:	1.6	:	:	2.1	:	:
USA	2.4	2.4	2.0**	2.0	2.0	1.4**	2.7	2.0	2.1**
Euro Area	1.8	1.8	1.8	1.3	1.4	1.2	1.6	1.4	1.5
Japan	1.0	1.0	1.0	1.1	0.7	0.8	1.5	0.9	1.5
United Kingdom	2.5	2.5	2.5	1.8	2.0	1.7	2.0	2.1	1.9
Developing economies	4.8	:	:	4.9	:	:	4.7	:	:
Brazil	3.7	:	3.7	3.6	:	3.9	4.1	:	4.0
Russia	2.9	2.9	:	5.0	5.2	:	4.5	4.0	:
India	3.5	:	3.4	3.9	:	3.2	4.2	:	4.2
China	2.1	2.4	1.9	2.3	2.0	1.9	2.5	2.0	2.1

Sources: IMF, *World Economic Outlook Update*, April 2019; OECD, *OECD Economic Outlook*, May 2019 (Preliminary version); European Commission, *European Economic Forecast*, Spring 2019.

* Projections.

** Personal consumption expenditure deflator.

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

USA: GDP growth in the US is expected to moderate in 2019 and 2020, moving around 2.4% and 2%, respectively (see Table 1.4.1). This decline reflects the negative effects of increased tariffs and the overall tension that has recently prevailed in US-China economic relations. The gradually fading effects of expansionary fiscal policy and the closure of Central Government core services for five full weeks toward the end of last year have played a negative role as well. Nevertheless, domestic demand remains strong thanks to the high employment rates and the favorable financing conditions that prevail domestically.

Eurozone: Under the burden of a series of external and internal factors, economic activity in the euro area is expected to slow significantly, with economic growth falling to 1.3% in 2019 (see Table 1.4.1). Although the decline in growth rates is widespread across Member States,¹ the slowdown in Germany (due to the fall in the automotive industry and other key manufacturing sectors), Italy (due to the weaken-

ing of domestic demand and the uncertainty caused by the country's fiscal position) and France (due to the risk of the recurrence and escalation of social tensions) is a particularly worrisome problem. For 2020, it is estimated that the rate of economic growth in the euro area will recover and settle at 1.5%. Next year's economic expansion is expected to receive support from a number of factors including: (a) the revival of international trade, (b) the improved labor market, (c) the maintenance of favorable financing conditions for households and businesses, and (d) a slightly expansionary fiscal policy.

Japan: Japan's economic growth is expected to remain sluggish and settle at 0.8% in 2019. The list of factors behind Japan's anemic economic performance includes weak external and domestic demand as well as low incentives for investment in the manufacturing sector. The planned tight budgetary policy for 2020 is expected to lead to a further slowdown of the economy, with the growth rate of GDP falling to 0.5%.

1. The only exception is Greece, which, according to the IMF, the OECD and the European Commission, is projected to enjoy a higher growth rate in 2019.

TABLE 1.4.3 Annual unemployment rates

	2018*					2019**					2020**				
	IMF	EC	OECD	ILO	IMF	EC	OECD	ILO	IMF	EC	OECD	ILO	IMF	EC	OECD
World economy	:	:	:	5.0	:	:	:	4.9	:	:	:	4.9	:	:	:
USA	3.9	3.9	3.9	3.9	3.8	3.8	3.7	3.9	3.7	3.7	3.6	4.0	3.7	3.7	3.6
Euro Area	8.2	8.2	8.2	:	8.0	7.7	7.9	:	7.7	7.3	7.7	:	7.7	7.3	7.7
Japan	2.4	2.4	2.4	2.4	2.4	2.3	2.4	2.4	2.4	2.2	2.4	2.3	2.4	2.2	2.4
United Kingdom	4.1	4.0	4.1	:	4.2	4.1	3.9	:	4.4	4.2	3.9	:	4.4	4.2	3.9
Brazil	12.3	:	:	12.5	11.4	:	:	12.2	10.2	:	:	11.7	10.2	:	:
Russia	4.8	4.0	:	4.7	4.8	4.0	:	4.5	4.7	3.9	:	4.4	4.7	3.9	:
China	3.8	3.8	:	:	3.8	:	:	:	3.8	:	:	:	3.8	:	:

Sources: IMF, *World Economic Outlook Update*, April 2019; OECD, *OECD Economic Outlook*, May 2019 (Preliminary version); European Commission, *European Economic Forecast, Spring 2019*; International Labour Office, *World Employment Social Outlook, Trends 2019*.

* Estimations, ** Projections.

The United Kingdom: The failure to reach a final exit agreement has triggered a period of high uncertainty. In turn, uncertainty inhibits private investment and increases the reluctance of households to spend for consumption purposes. As fiscal stimuli cannot fully offset losses stemming from internal and external demand, the economy is projected to register a further slowdown, with GDP growth falling to 1.2%.

Developing economies

In contrast to advanced economies, most developing and emerging economies are expected to maintain their growth momentum in 2019 (see Table 1.4.1). Growth performance is set to be particularly strong in China and India. In China, support for economic activity is expected to come mainly from domestic demand that is driven by favourable policy measures. In India, the economy seems to benefit from the ongoing recovery of private investment and consumption amidst an expansionary monetary and fiscal policy (IMF, 2019). As for Brazil, its economy is expected to gain momentum in the course of the current year. On the contrary, the Russian economy is expected to slow down due to lower international oil prices, accelerated inflation and higher borrowing costs (European Commission, 2019).

1.4.3. World trade and commodity prices

In 2019 the expansion rate of international trade (volume of goods and services) is projected to fall by 0.4 to 1.8 percentage points (see Table 1.4.4). The factors

contributing to this slowdown include: (a) the increase of tariff protection on the part of China and the US, (b) the reduction of imports/exports of capital goods due to the weakening of investments, (c) the lower global demand for semi-conductors, and (d) the fall in demand for intermediate goods due to the anemic activity of global value chains (OECD, 2019). Provided that an escalation of trade protectionism is avoided, international trade is expected to gain momentum during the course of the coming year.

Concerning commodity prices, the current period is characterized by frequent ups and downs. This is due to the frequent fluctuations in the demand and output for the respective products, especially oil. Despite the great uncertainty that surrounds forecasts, it is estimated that the international oil price during the current and the next year will fluctuate around \$65 per barrel. As for basic metals, it is expected that prices will stabilize at their current levels.

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TABLE 1.4.4 World trade volume (annual percent changes, goods and services)

2018*				2019**				2020**			
IMF	EC	OECD	UN	IMF	EC	OECD	UN	IMF	EC	OECD	UN
3.8	3.6	3.9	3.6	3.4	3.2	2.1	2.7	3.9	3.5	3.1	3.4

Sources: IMF, *World Economic Outlook Update*, April 2019; OECD, *OECD Economic Outlook*, May 2019 (Preliminary version); European Commission, *European Economic Forecast, Spring 2019*; United Nations, *World Economic Situation and Prospects as of mid-2019*.

* Estimations, ** Projections.

2. Public finance

KEPE, *Greek Economic Outlook*, issue 39, 2019, pp. 26-30

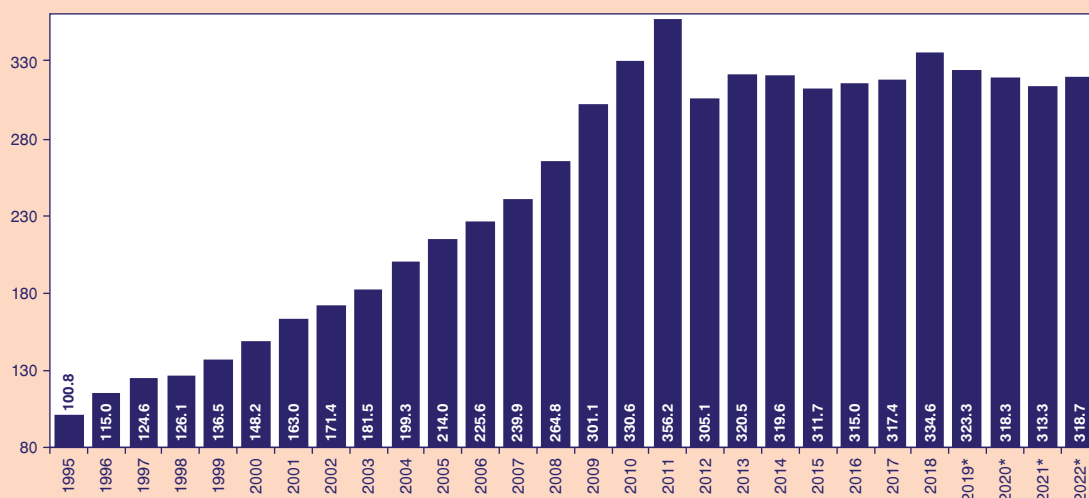
2.1. The evolution and structure of public debt

Christos Triantopoulos

The level of public debt in 2018 was influenced, in parallel with the outcome of the fiscal policy pursued, by the treasury management policy in the context of the creation of a “safety net” to secure liquidity, once the country completed the financial support program. In 2018, according to the Hellenic Statistical Authority, the General Government debt amounted to 334.6 billion euros, compared to 335 billion euros, which was the State Budget 2019 estimate (November 2018). Despite this marginally better performance, however, the ratio of public debt as a percentage of GDP has deteriorated due to the lower than expected GDP performance. In particular, the GDP level of 2018 is

estimated, according to the provisional data of the Hellenic Statistical Authority, to stand at 184.7 billion euros, while the State Budget 2019 estimate was 185.7 billion euros (the corresponding estimate in the Medium-Term Fiscal Strategy 2019-2022 was 182.9 billion euros). Therefore, in 2018 the public debt as a percentage of GDP is estimated at 181.2% of GDP instead of 180.4% of GDP which was estimated in the State Budget 2019 (the corresponding estimate in the Medium-Term Fiscal Strategy 2019-2022 was 183.1% of GDP). As for 2019, according to the Medium-Term Fiscal Strategy 2019-2022, the General Government debt is estimated to fall by about 12 billion euros and thus be limited to 323.3 billion euros, as part of last year’s liquidity will be utilized for the needs arising from the current year’s debt obligations. Finally, for the period thereafter, it is estimated that the General Government debt will reach 318.3 billion euros in 2020, 313.3 billion euros in 2021 and 318.7 billion euros in 2022 (Figure 2.1.1) .

FIGURE 2.1.1
General Government debt (1995-2022)



Source: European Commission (1995-2015), Hellenic Statistical Authority (2016-2018) and Medium-Term Fiscal Strategy (2019-2022).

Note: *Estimate.

TABLE 2.1.1 Structure of Central Government debt

	2011		2013		2017		2018		March 2019	
	Million euros	% debt	Million euros	% debt	Million euros	% debt	Million euros	% debt	Million euros	% debt
A. Bonds	259,774	70.6	76,296	23.7	50,457	15.4	51,551	14.4	59,828	16.7
Bonds issued domestically	240,940	65.5	73,415	22.8	48,681	14.8	49,779	13.9	58,109	16.2
Bonds issued abroad*	18,833	5.1	2,880	0.9	1,776	0.5	1,771	0.5	1,719	0.5
B. T-Bills	15,058	4.1	14,970	4.7	14,943	4.5	15,280	4.3	15,269	4.3
C. Loans	93,145	25.3	230,210	71.6	248,373	75.6	267,598	74.6	263,121	73.6
Bank of Greece	5,683	1.5	4,734	1.5	2,849	0.9	2,377	0.7	2,377	0.7
Other domestic loans	836	0.2	115	0.0	247	0.1	229	0.1	224	0.1
Financial Support Mechanism loans	73,210	19.9	213,152	66.3	232,959	70.9	253,105	70.5	252,667	70.6
Other external loans **	13,414	3.6	12,208	3.8	12,318	3.7	11,887	3.3	7,853	2.2
D. Short-term loans ***	0	0.0	0	0.0	14,931	4.5	24,521	6.8	19,475	5.4
Total (A + B + C + D)	367,978	100.0	321,477	100.0	328,704	100.0	358,950	100.0	357,693	100.0

Source: Public Debt Bulletin (December 2011, December 2013, December 2018) and General Government Bulletin (March 2019).

Notes: * Including securitization issued abroad.

** Including special purpose and bilateral loans.

*** Including repos.

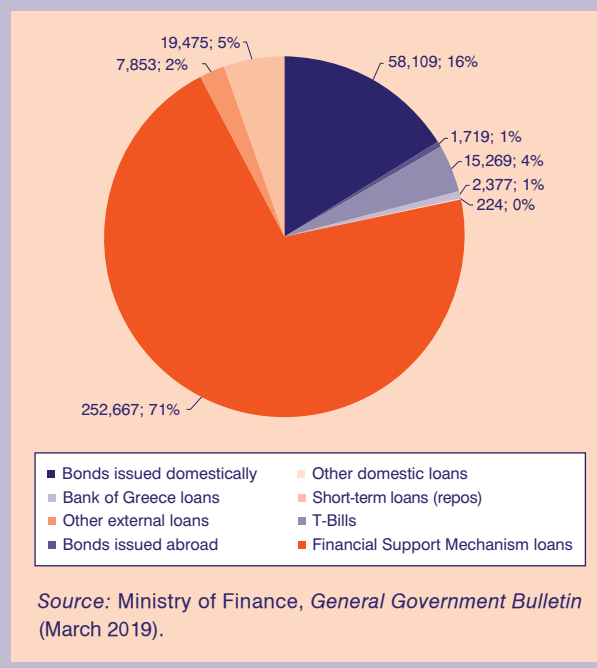
Regarding the Central Government debt, according to the General Government Monthly Bulletin, it stood at 357.7 billion euros in March 2019, showing a decrease of 1.2 billion euros compared to the end of 2018 (358.9 billion euros in 2018 and 328.7 billion euros in 2017), while in 2019 –according to the State Budget 2019– it is expected to reach 346.2 billion euros. As noted before, the fact that the Central Government debt is higher than the General Government debt is due to the intergovernmental debt, which includes the short-term borrowing through repos agreements with General Government entities. Also, the structure of the Central Government debt changed in the first quarter of 2019, compared to the end of last year, as a result of the country's borrowing from the international capital markets. Thus, the share of debt in bonds was set at 59.8 billion euros in March 2019, from 51.5 billion euros at the end of 2018. Bonds now account for 16.7% of the total Central Government debt, compared to 14.4% at the end of 2018 (Table 2.1.1 above).

Also, there was no significant change in Central Government funding through short-term securities and, in particular, Treasury bills, which amounted to 15.2 billion euros. On the contrary, both external loans and short-term loans (including repos) declined. Specifically, the share of debt in loans was limited to 263.1 billion euros, mainly as a result of the decline in other external loans by 4 billion euros. Thus, as a whole, the volume of Central Government debt recorded in loans declined to 263.1 billion euros, constituting 73.6% of the debt in March 2019 against 74.6% of the debt at the end of 2018 (Figure 2.1.2).

Finally, the source of funding that was limited in the first quarter of 2019 was that of short-term borrowing through repos agreements with General Government entities. More specifically, in March 2019 the intergovernmental borrowing through repos amounted to 19.5 billion euros, which is about 5 billion euros lower than December 2018, when it reached 24.5 billion euros (Figure 2.1.3). Thus, this specific source of funding, according to data released in March 2019, equals now to 5.4% of the Central Government debt, from 6.8% in December 2018. It is worth noting that this limited exposure to intergovernmental borrowing through repos has an increasing effect on the level of the General Government debt, as it reduces the intergovernmental debt of the Central Government that 'covers' part of the General Government debt.

As far as the structural characteristics of the Central Government debt are concerned, there were changes

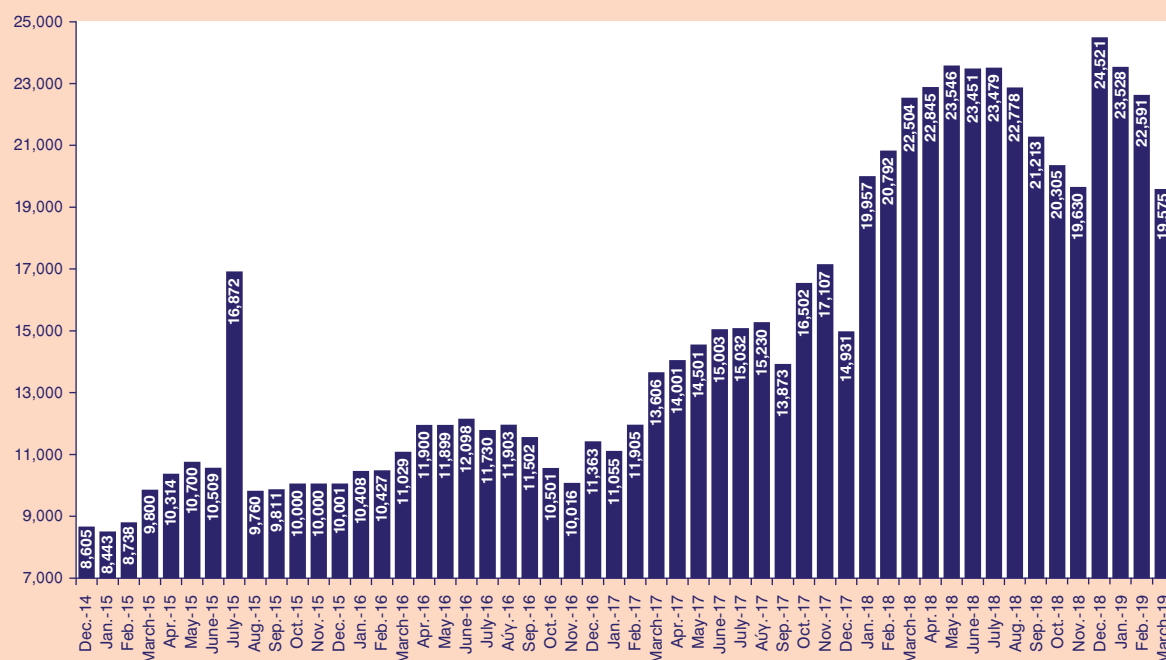
FIGURE 2.1.2
Central Government debt (March 2019),
(million €; % debt)



as a result of the promotion of short-term measures to strengthen the long-term sustainability of the public debt. In particular, the structure of the Central Government debt was mainly affected by the stability or instability of the interest rate. Thus, in December 2018, the Central Government debt at fixed-rate stood at 89.2% of the debt, against 48.1% of the debt in December 2017 and 28.5% of the debt in December 2013 (Table 2.1.2). This is a share that increased further in 2019 in the context of the country's borrowing from the international capital markets, resulting in 90.9% in March 2019. The result is, therefore, the strengthening of the country's public debt against risks associated with interest rate fluctuations and changes in the monetary policy. With regard to the other characteristics, in March 2019, the non-negotiable debt fell to 79.0% of the total debt compared to 81.4% of the debt in December 2018, due to the country's financing through bonds from the international capital markets, while the share of debt expressed in euros increased to 98.0% (Table 2.1.2).

As a final remark, regarding the debt management strategy in the following period, in line with the Medium-Term Fiscal Strategy framework, it will include: (a) covering the annual gross financing needs of the Greek government through the establishment of continuous and permanent access to the inter-

FIGURE 2.1.3
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.

TABLE 2.1.2 Composition of Central Government debt

	December 2011	December 2012	December 2013	December 2017	December 2018	March 2019
A. Rate						
Fixed rate ¹	62.0%	32.7%	28.5%	48.1%	89.2%	90.9%
Floating rate ^{1, 2}	38.0%	67.3%	71.5%	51.9%	10.8%	9.1%
B. Trade						
Tradable	74.7%	34.3%	28.4%	19.9%	18.6%	21.0%
Non-tradable	25.3%	65.7%	71.6%	80.1%	81.4%	79.0%
C. Currency						
Euro	97.5%	96.7%	95.9%	97.4%	97.9%	98.0%
Non-Euro area currencies	2.5%	3.3%	4.1%	2.6%	2.1%	2.0%

Source: Public Debt Bulletin (December 2011, December 2012, December 2013, December 2017, March 2019).

Notes: 1. Fixed/floating participation is calculated including Interest Rate Swap transactions.

2. Index-linked bonds are classified as floating rate bonds.

national capital markets, (b) actively managing the market risks in the Greek public debt portfolio, (c) managing of the cash reserves of both the Government and the General Government entities, and (d) managing the Greek Government's short-term liquidity. In this context, as mentioned above, the "safety

net" (in terms of liquidity) established in 2018 is also included; thus, according to the Public Debt Bulletin, in March 2019 the Greek Government's cash reserves stood at 22.5 billion euros and the reserves in the special public debt account stood at 1.8 billion euros.

3. Human resources and social policies

KEPE, *Greek Economic Outlook*, issue 39, 2019, pp. 31-37

3.1. Recent developments in key labour market variables

Ioannis Cholezas

3.1.1. Introduction

In the last quarter of 2018 unemployment increased while, unsurprisingly, employment decreased, due to the seasonal fluctuation of economic activity. However, the situation in the labour market seems to have improved, at least compared to 2017. On an annual basis, employment continues to recover although at a slower pace. On average, the labour force consisted of 4,714.8 thousand individuals over the age of 15 in 2018; hence, it has shrunk by 0.8% since 2017, for various reasons. On the other hand, there were 75.4 thousand more employed (approximately 2%) in 2018, while the number of the unemployed decreased by 10.9% (i.e., 112 thousand people). These facts represent positive developments, but leave no room for complacency. For example, despite the decrease in the number of underemployed individuals in 2018, their number actually increased in certain age groups. Moreover, full-time hires in paid employment represented fewer than half of the overall hires. Regarding unemployment, university graduates face a decreasing unemployment rate, although the drop seems to be slowing down. On the other hand, upper technical vocational education graduates and post-graduates seem to do relatively better.

3.1.2. Employment

The number of the employed decreased in the last quarter of 2018 by almost 60 thousand, which is no surprise given the seasonal fluctuation of economic activity; hence, it reached 3.828 million individuals. However, compared to the last quarter of 2017, there were approximately 97 thousand more employed. Thus, the Greek economy continues to create jobs. However, the rate of job creation has slowed compared to 2017. In particular, there were 75.4 thousand

new jobs in 2018 compared to 79.1 thousand new jobs in 2017. Note, though, that there was a similar decline in 2015-2016. Back then the number of new jobs was 63 thousand compared to 74.4 thousand in period 2014-2015. Therefore, it would be unwise to jump to conclusions.

Despite the steady annual increase in the number of the employed since 2014, the employment rate is still very low and only marginally above 51% for males and approximately 33.5% for females, for individuals over 15. Overall, the employment rate in the last quarter of 2018 stood at 42%. Nevertheless, it should be noted that even when the economy was growing in the past, the employment rate never exceeded 50% (over 60% for males and below 40% for females). Moreover, the employment rate for age group 25-64 is below 63%, which is very low compared to most European countries. Note that the EU-28 average employment rate was over 75% in the last quarter of 2018.

The decline in the number of the employed in the last quarter of 2018 involved primarily females (35.3 thousand); in relative terms, the decline in the number of employed females was double that of males (2.2% vs. 1.1%). Moreover, the annual increase in the number of employed males was bigger (57.5 thousand or 2.6% vs. 17.9 thousand or 1.1% for females). This means that males are more favoured by employment recovery, while short-term fluctuations hurt females more, perhaps due to more job insecurity associated with female employment choices (temporary job contracts and employment in more seasonally volatile industries).

Seasonal volatility is also more pronounced amongst younger individuals. In particular, in the last quarter of 2018, the number of employed youth aged 15-29 decreased by 4.6%, while the number of the employed over 30 decreased by 1.1%. On the other hand, on an annual basis the increase is bigger for the latter group (2% vs. 1.5%). Similar to females, employed youth aged 15-29 prove more vulnerable to short-term employment fluctuations than the employed over 30 who seem to benefit more from the upward employment trend. These findings verify that female and youth employment move in a similar manner. Another interesting observation is that the group of youth is more

heterogeneous than usually perceived. A closer look reveals that the increase in the number of employed youth in 2018 involved the age group 25-29 (+9.7 thousand). On the contrary, in period 2016-2017 the exact opposite was true; this was the only age group to exhibit a decrease in the number of employed individuals.

Exploring changes in the number of the employed since employment began to recover in 2014, it is worth mentioning four facts. First, the number of employed individuals over 65 (42.2%) exhibited the biggest increase, especially females (72.2%). Second, the smallest increase was reported for employed individuals aged 30-44, which is the most active population group, and it also involved primarily females (just 0.8% decrease). Third, the percentage change of employed females was slightly bigger than that of males (9.8% vs. 8.4%). Fourth, the number of employed females aged 15-19 and 20-24 exhibited a noticeable increase compared to their male counterparts (34.2% vs. 3.5% and 22.5% vs. 3%, respectively).

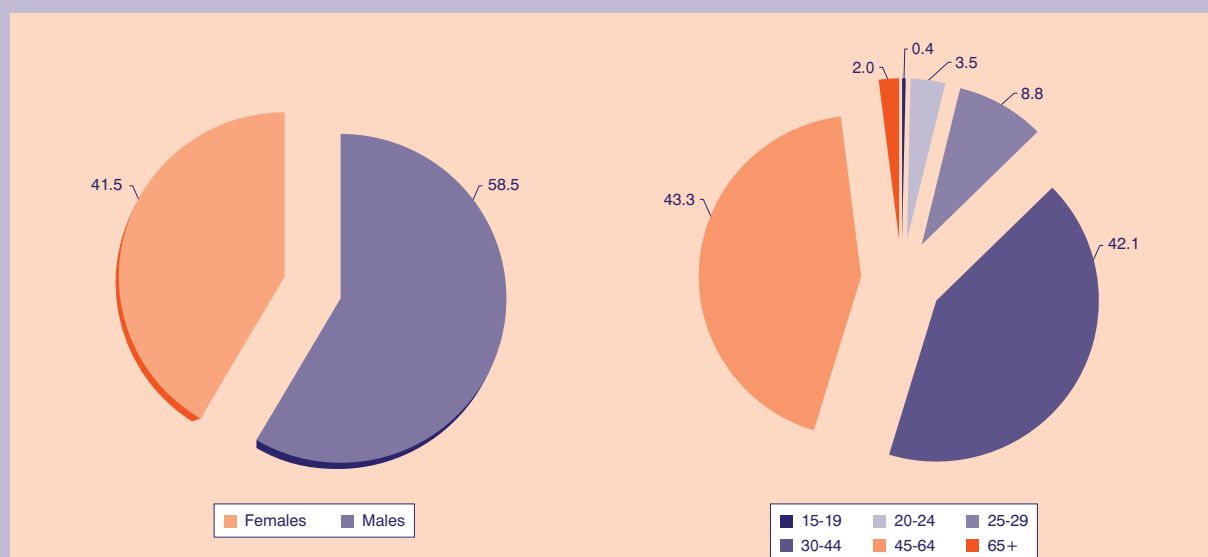
Employment composition

Three graphs that follow present the employment composition in 2018 (on average) in terms of gender, age, educational attainment and industry. Nearly six out of ten employed individuals are males (Graph 3.1.1), reflecting the higher male participation rate and better employment prospects, since the popu-

lation shares of males and females over 15 years old are almost identical. Moreover, most of the employed belong to the age group 45-64; the second group consists of individuals aged 30-44, while the share of youth and, particularly, persons younger than 25 represent a very small share of the employed. Taking into account the age composition of the population, there seem to be three age groups that are under-represented amongst the employed and another three age groups that are over-represented, i.e., their share amongst the employed is smaller than their share amongst the population and vice versa. The first category involves individuals aged 15-19, 20-24 and 65+, while the second group consists of the remaining three age groups. This finding comes as no surprise given the extensive participation of younger individuals in education, which is usually not consistent with employment, and the retirement of persons older than 65. Note, for instance, that the employment rate for persons aged 15-19 was 2.5% in 2018 and for persons over 65 it was 3.3%. On the contrary, the employment rate for people aged 30-44 was as high as 71.7% in 2018, but still nearly nine percentage points lower than 2008 (80%).

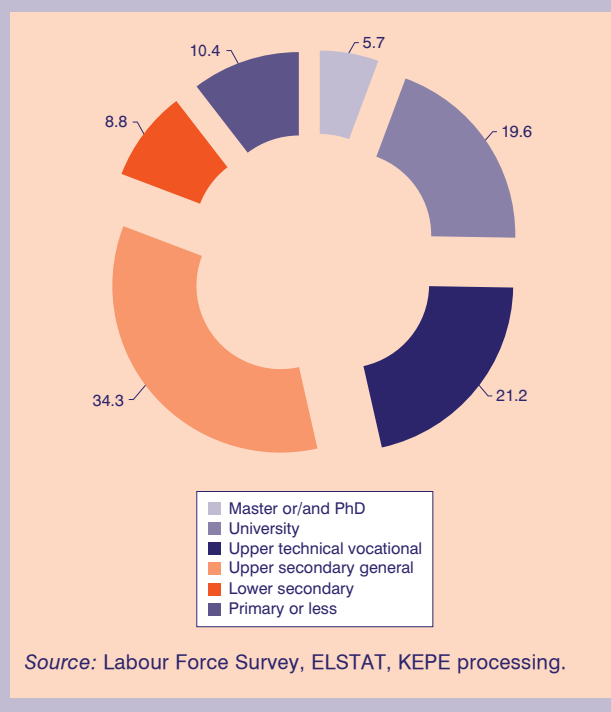
Most of the employed over the age of 15 were secondary education graduates, i.e., lyceum graduates (Graph 3.1.2). The next biggest group consisted of upper technical vocational education, which includes TEI graduates, while the third biggest group consisted of university graduates. The smallest group was

GRAPH 3.1.1
Share of the employed by gender and age group in 2018



Source: Labour Force Survey, ELSTAT, KEPE processing.

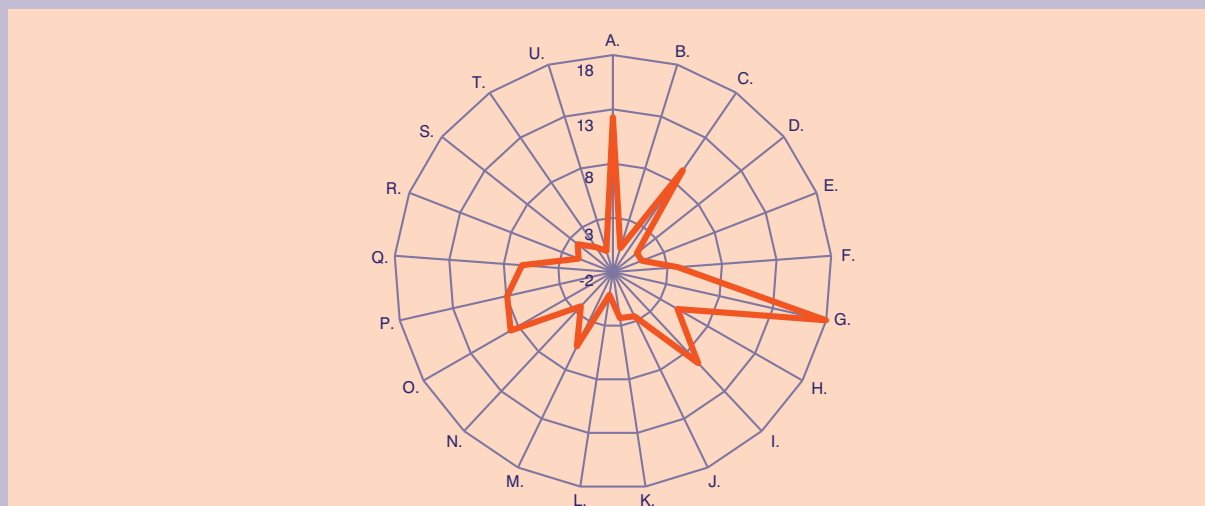
GRAPH 3.1.2
The employed by level of educational attainment in 2018



made up of Master and/or PhD holders. However, when population shares are considered, the last group exhibits the smallest deviation, meaning that the largest percentage of this group (approximately 80%) was employed in 2018, contrary to, for example, secondary education graduates (approximately 30%). More than 60% of university and upper technical vocational education graduates were employed in 2018; the respective shares were close to 75% in 2008.

The distribution of the employed amongst industries continues to be uneven. Most individuals –approximately one out of four, in particular– were employed in Wholesale and retail trade (G) in 2018 (Graph 3.1.3). Agriculture (A) was the second biggest employer, offering jobs to 12% of the employed, followed by Tourism (I), Manufacturing (C) and Public administration (O) with a share close to 8% each. The recovery in employment that started in 2014 has been changing these shares over time depending on which industry has been performing better. It is interesting that almost all industries have increased the number of their employed individuals since then, with the exception of four industries: Agri-

GRAPH 3.1.3
The employed by industry in 2018



Source: Labour Force Survey, ELSTAT, KEPE processing.

Note: A. Agriculture, forestry and fishery, B. Mining and quarrying, C. Manufacturing, D. Electricity, gas, steam and air conditioning supply, E. Water supply, sewerage, waste management and remediation activities, F. Construction, G. Wholesale and retail trade, repair of motor vehicles and motorcycles, H. Transportation and storage, I. Accommodation and food service activities, J. Information and communication, K. Financial and insurance activities, L. Real estate activities, M. Professional, scientific and technical activities, N. Administrative and support service activities, O. Public administration and defence, compulsory social security, P. Education, Q. Human health and social work activities, R. Arts, entertainment and recreation, S. Other service activities, T. Activities of households as employers, U. Activities of extraterritorial organizations and bodies.

culture (A), Construction (F), Financial services (K) and Households as employers (T). On the contrary, the biggest industries in terms of the number of employed that expanded even more include Manufacturing (C) by 10%, Wholesale and retail trade (G) by 9%, and Other service activities (S) by 40%. The remaining industries have increased the number of persons they employ, some of which, quite impressively, represent only a small fraction of total employed individuals.

Underemployment and part-time employment

The number of the underemployed, i.e., those who wish to work longer hours but cannot find a job, increased in the fourth quarter of 2018 by 8.4 thousand or 3.6%. Therefore, this share went up from 6% in 2017Q4 to 6.3% in 2018Q4. The number of underemployed males increased faster than that of underemployed females (5.4% vs. 2%). On an annual basis, i.e., for the entire 2018, the number of the underemployed decreased by 14 thousand compared to 2017 (i.e., 5.4%). The reduction was not uniform across genders and age groups. In particular, the biggest decrease was reported amongst females (7.6% vs. 2.7%). Regarding age, the number of underemployed people aged 45-64 exhibited the biggest decrease (14%), followed by individuals aged 20-24 (11%). On the other hand, the number of the underemployed aged 15-19 doubled. This big increase is driven by the increase in the number of underemployed males. Therefore, despite the fact that underemployment seems to decrease for the majority, showing an improvement in labour utilization, the situation seems to worsen for the young (15-19).

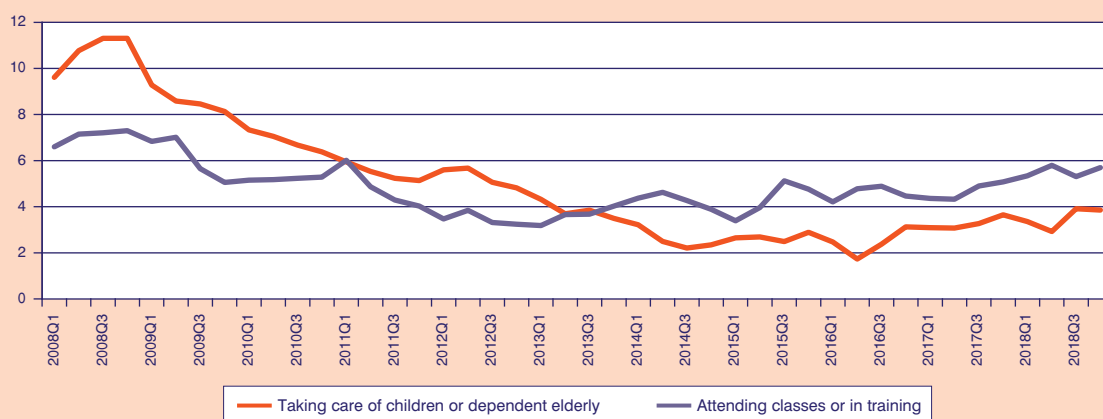
However, it should be noted that there was a similar increase recorded in period 2016-2017; hence, more analysis would be necessary before drawing any solid conclusions.

The share of part-time employment, which is a type of underemployment, remained stable at 8.7% in the last quarter of 2018 (compared to 2018Q3), despite the decrease in the number of part-timers, but it was smaller than the last quarter of 2017. There are two interesting points to stress with respect to the composition of the part-timers (Graph 3.1.4). The first is that the share of those who report participating in education as the primary reason for working part-time has been increasing; the share reached 4% in the last quarter of 2018, very close to the 2008 figure. So long as this is a personal choice, it is particularly promising for the future because it signals that more and more of the employed are looking to improve their qualifications and, thus, improve their employability. The second point is the increasing share of part-timers who report taking care of children and elders as a reason for working part-time; note that during the crisis the importance of this reason decreased considerably. The increase could signal the return of people with children and elderly people in their household to the labour force, which would be a positive development, or the increasing importance of such problems due to income constraints and fewer options available, which would be a negative development.

Paid employment-*ERGANI*

The balance in paid employment was positive in 2018; overall, there were 141 thousand more hires than sep-

GRAPH 3.1.4
Reasons for part-time employment, 2008Q1-2018Q4 (%)



Source: Labour Force Survey, ELSTAT, KEPE processing.

arations (quits and layoffs). This is one of the best performances of the past few years, except for 2017, which means that the creation of new paid-employment jobs may be slowing down. Fewer than half of the hires involved full-time contracts (45.7%), 41.7% involved part-time contracts and the remaining 12.7% involved work-in-shifts contracts. The composition of the hires was similar to that of 2017 (new work-in-shifts contracts were marginally fewer), which suggests that it is becoming a norm. Regarding contracts that were converted to a different type in 2018, the number of full-time contracts converted to part-time contracts increased compared to 2017, while the number of the other two types, especially conversions to work-in-shifts contracts without the employee's consent, decreased (by 3.3 percentage points).

The most recent data on paid employment at the time of writing refer to March 2019. The number of paid employees increased in the first quarter of the year by approximately 48.9 thousand persons, fewer by 6.7 thousand compared to the first quarter of 2018. This means that since 2014, when the employment recovery began, this is the second biggest increase in paid employment. Typically the number of employees decreases in January, while it increases in February and March, with the exception of period 2009-2013. Moreover, approximately 46% of new hires involved full-time contracts, 41% part-time contracts and 13% work-in-shifts contracts. These shares are similar to those for the first quarter of 2018. However, the share of full-time contracts in the first quarter of 2019 increased compared to the respective period in 2018 while the shares of both other types of job contracts decreased.

The biggest share of paid employment hires in the first quarter of 2019 is recorded in Attica, where one out of three new jobs was created. One out of five new employees was hired in the South Aegean islands, while one out of three was hired in Crete and Central Macedonia (15% each). Compared to the first quarter of 2018, the share of new hires remained almost unchanged in Attica, the South Aegean islands, Continental Greece and the North Aegean islands (the decrease was smaller than 0.5 percentage points), while it increased by 1.6, 2, and 3.5 percentage points in East Macedonia and Thrace, West Greece, and Central Macedonia, respectively. On the other hand, new hires declined in Crete (>5 percentage points). Given that it is the start of the year, it is too risky to draw conclusions concerning the evolution of paid employment in the following months. The only thing certain is that some regions performed better than last year.

3.1.3. Unemployment

The unemployment rate increased slightly in the last quarter of 2018 to reach 18.7% for individuals over 15. Despite the recovery of economic activity, approximately one out of four persons who participates in the labour force is still unable to get a job. The total number of the unemployed reached 881.1 thousand persons. However, the unemployment rate was smaller than in 2017Q4, since the number of the unemployed decreased by 125.7 thousand persons. The decrease was driven primarily by males; the number of unemployed males decreased by 15.3% or 70 thousand persons. Unsurprisingly, the biggest share of the decrease (almost 60%) was due to males. The difference between young individuals aged 15-29 and those aged over 30 was limited (close to 1.7 percentage points). However, since the number of the unemployed over 30 is much bigger, they represented over 70% of the annual reduction in the number of the unemployed. These observations are in accordance with those regarding the number of the employed.

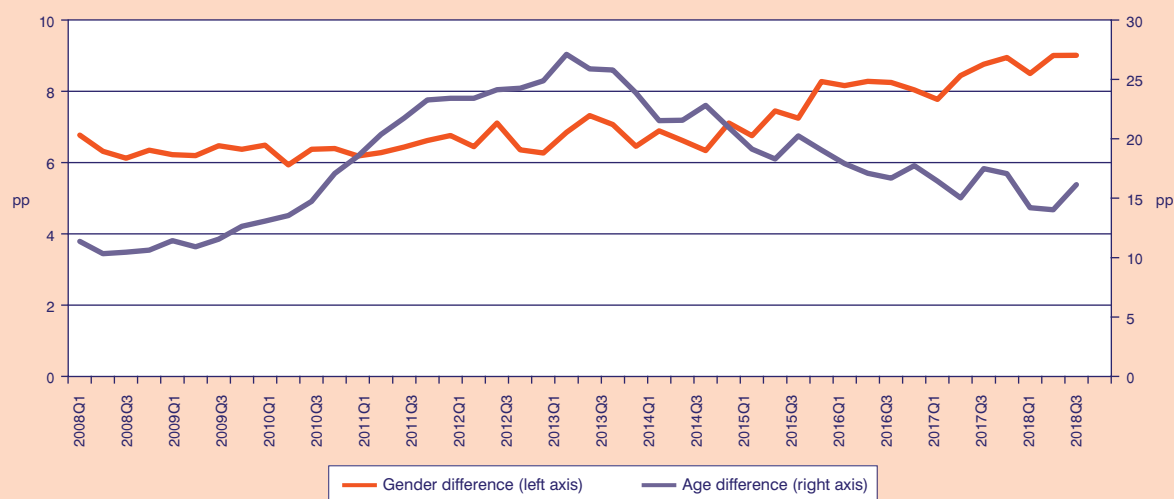
The unemployment rate for females continued to exceed that of males by approximately 9 percentage points, which is similar to the prevailing difference in the last quarter of 2017; thus, the gap has continued to expand since 2015 (Graph 3.1.5). There was a wider difference in the unemployment rate between the young aged 15-29 and individuals over 30 in the last quarter of 2018 compared to the third quarter, but slightly smaller compared to 2017Q4. This means that the difference did not escape the downward trend that started in 2013 (Graph 3.1.5).

The share of the unemployed aged 15-29 increased by 2 percentage points in the last quarter of 2018, faster than that of individuals over 30, and reached 32.4%. Particularly, male individuals aged 15-19 saw their employment chances deteriorate more (the unemployment rate increased by 14.4 percentage points), followed by females aged 20-24 (4.4 percentage points). Unemployment continued to be a very big problem for females aged 15-19 (56.2%), while males of the same age group followed closely (50.3%). In any case, the de-escalation of the unemployment rate (compared to the last quarter of 2017) is also valid for youth aged 15-29. Indeed, the de-escalation is faster: 3.6 percentage points vs. 2.3 percentage points for individuals over 30.

The share of the long-term unemployed in 2018 dropped slightly below 70%. This rate was close to 2013Q4, showing signs of de-escalation, but it was still far from the low point at the end of 2008 (nearly 46%).

GRAPH 3.1.5

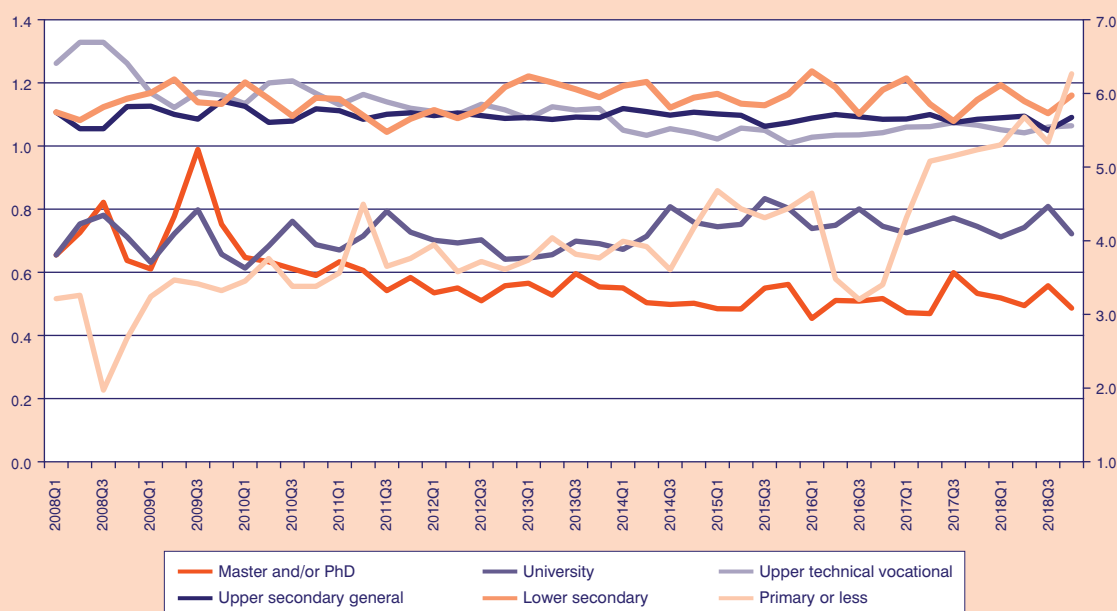
Differences in the unemployment rate by gender and age groups (in percentage points)



Source: Labour Force Survey, ELSTAT, KEPE processing.

GRAPH 3.1.6

Ratio of the unemployment rate to the national average, 2008Q1-2018Q4



Source: Labour Force Survey, ELSTAT, KEPE processing.

There is no doubt that this is a positive development, since, despite the implementation of active labour market policies, reducing long-term unemployment is not an easy task. The reasons behind the decrease are also difficult to explore. Moreover, the share of the newly unemployed, i.e., those who are categorised

as unemployed for the first time, was close to 20% in 2018, a rather stable share over the past few years.

The unemployment rate changed in the last quarter of 2018, but the change was not uniform across education groups. Master and/or PhD holders and university graduates saw their unemployment rate decrease

by 1.1 percentage points and 1.3 percentage points, respectively; at the end of 2018 it stood at 9.1% and 13.1%, which is quite satisfactory compared to individuals over 15 with fewer years of education. Although the unemployment rate increased for all education groups, the increase was stronger for lyceum (upper secondary general) and gymnasium (lower secondary) graduates. Compared to the same period in 2017, the unemployment rate decreased more amongst upper technical vocational education graduates, lyceum and gymnasium graduates. The annual average rate of unemployment decreased by approximately 2.5 percentage points for the last three groups of graduates; the smallest decrease was reported for Master and/or PhD holders.

Graph 3.1.6 above presents the ratio of the unemployment rate for each group of graduates to the national average and shows how it has developed over the past eleven years. A ratio smaller than one indicates that the specific group of graduates face an unemployment rate lower than the national average, while a ratio bigger than one indicates that the group faces an unemployment rate higher than the national average. It seems that only Master and/or PhD holders and university graduates have managed to maintain an unemployment rate lower than the national average. During period 2008-2013 graduates from the three upper education levels saw their unemployment rate increase at a slower pace than the national average, while graduates from the three lower levels of education saw their unemployment rate increase faster than the national average. On the other hand, during the subsequent years (2013-2018) the reduction in the unemployment rate has been faster for Master and/or PhD holders followed by upper technical vocational education and

gymnasium graduates. For the remaining groups, including university graduates, the unemployment rate has been dropping at a slower pace than the national average, while for primary education graduates, the unemployment rate has been increasing. These changes reflect the development of demand for and supply of labour, as well as phenomena such as the substitution between employed individuals with various educational qualifications.

3.1.4. Conclusions

The conclusions from the descriptive analysis presented seem to be once again unclear. On a quarterly basis, the situation in the labour market worsened, which was expected given seasonal fluctuations of economic activity. On an annual basis, the situation seems to be improving, at least based on the variables discussed. Even so, improvements in the labour market are slow and seem to be slowing further. The unemployment rate is still unacceptably high, while the employment rate is far from its historical high. Moreover, the size of the labour force is shrinking as a result of the emigration of natives and immigrants who are looking for a job abroad and the stable participation rate. Given the ageing of the population in Greece, there is no room for complacency.

More solid conclusions on the development of labour market conditions could be drawn only after using richer and more detailed data with information on wages, the quality of the matching between demand for and supply of labour, vacancies, working hours, working conditions, etc. However, this is beyond the scope of this article.

3.2. Income inequality indices in the European Union (EU15)¹

Vlassis Missos

3.2.1. Introduction

The growing interest in the current economic research focusing on income inequality is an indication of the fears harbored by those institutional agencies actively participating in the process of reorienting and implementing social policy. Some of the most intriguing questions that have risen among policy makers in Europe are related to the continuous research and ongoing evaluation of several factors contributing to the upsurge of income inequality.² In addition, they also contribute to the formulation of an extensive agenda consisting of relevant proposals and political initiatives aimed at developing a common view as well as means for achieving the goal of a less unequal distribution of income. After all, that is also the rationale which has led to the formation of the Europe 2020 Strategy, where the basic targets on income inequality, poverty and social exclusion have been translated into a set of specific policy measures to be implemented at a European level.

In the same context, most of the recent studies concerning the unequal state of income distribution make particular use of the concept of total disposable (after taxes have been subtracted) household income which, after having gone through a standard statistical procedure, is allocated among the members of the household. In that respect, individual income is deduced from the household income, based upon an “equivalence scale”, according to the number of members in a household both adults and underaged individuals, generally dependent family members. Hence, the term individual “equivalized disposable income” corresponds to a statistical measure that should be

distinguished from the concept of earned “income”, on the assumption that the total household earnings are allocated among the members of the household, independently of whether they have participated in its production or not (the income is allocated among the economically active as well as the inactive population). During the last few years, statistical weighting follows the OECD adjusted scale, also adopted by Eurostat.³

Furthermore, the official database used for the construction of the basic income inequality indices regarding personal distribution stems from the annual sample Survey of Income and Living Conditions (EU-SILC), which is conducted by all statistical authorities at a national level under the supervision of Eurostat. The whole process of ordering and managing the collected micro-data follows the basic principles of a broadly accepted methodology that is applied among the countries of the EU, allowing for the construction of indices that are methodologically consistent, while also permitting comparability between national economies. In that way, the investigation of income inequality between EU countries becomes feasible, given the various qualitative differences that exist between the national welfare states. However, due to the significant time resources required for collecting and retrieving the information of a great number of questionnaires, the publication of EUSILC surveys is subject to delays. The availability of the micro-data is characterized by a significant time lag. For example, during the period this paper was written, the most recently published and complete micro-database refers to the EUSILC of 2017, which corresponds to household income earned in the previous year (2016).

This presentation is limited to three simple and easily captured indices of income inequality, based on the EUSILC database. These are the *Gini* index, the income quintile share ratio (s80/s20) and the relative poverty rate. Concerning the first and the third, along with the parallel interpretation of the aforementioned magnitudes, the impact of the social welfare system on income inequality is also investigated. The latter is achieved by dividing the total expenditures between

1. The group of the EU15 corresponds to a statistical sub-category containing all countries that were members of the European Union before the 1st of May 2004. More specifically, the category of the EU15 refers to the following: Austria (AU), Belgium (BE), France (FR), Germany (DE), Denmark (DK), Greece (EL), Ireland (IE), Spain (ES), Italy (IT), the Netherlands (NL), Portugal (PT), Sweden (SE), Finland (FL), the United Kingdom (UK) and Luxembourg (LU).

2. EC (2017), “European semester thematic factsheet: Addressing inequalities”, European Commission.

3. Hagenaars, A., K. de Vos & M.A. Zaidi (1994), *Poverty Statistics in the Late 1980s: Research Based on Micro-data*, Office for Official Publications of the European Communities. Luxembourg.

pensions and other social transfers (apart from pensions), so that their contribution to the reduction of the overall inequality is calculated separately.

3.2.2. Basic income inequality indices

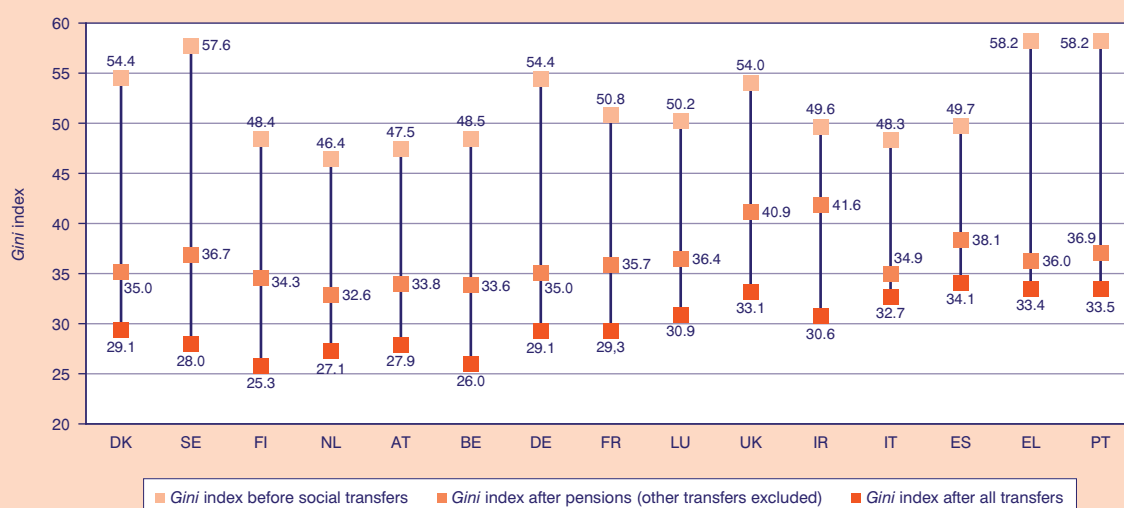
The *Gini* index is one of the most prominent and comprehensible indices for measuring income inequality. Its range of values spans between 0 and 100, with the lower boundary standing for absolute equality and the upper for the exact opposite, i.e., absolute inequality. For our current purposes, apart from the numerous interpretations proposed in order to understand what the *Gini* actually means, it would suffice to conceive the index as capturing the average distance between the distribution of income as it already exists to that which would have been if absolute equality had prevailed, as a percentage of the total disposable income.⁴ In other words, higher (lower) values of *Gini* correspond to a higher (lower) level of inequality.

Figure 3.2.1 depicts the *Gini* index in three different versions for all countries of the EU15 for the year 2016 (EUSILC 2017). Firstly, *Gini* is calculated according to the distribution of equivalized disposable income, estimated before and after social transfers have been realized. As far as the second version, *Gini* reflects the

level of total inequality as it is deduced from the new distribution of income after pensions have been reimbursed to the beneficiaries. Furthermore, the third version refers to the inequality of income distribution after all other social transfers have been paid. In that way, the impact of total social transfers on income inequality may be estimated as a whole or in part, depending on the manner social expenditures are analyzed.

It is obvious that among the countries of the EU15, the values of the *Gini* index measured before social transfers are substantially different. In the Netherlands (46.4), Austria (47.5) and Italy (48.3), inequality appears to be relatively low, whereas in Greece and Portugal, it tends to be higher (58.2 for both). In addition a clear disproportional downturn in the level of inequality is shown immediately after the amount of pensions is calculated. For example, even though the Netherlands (32.6) and Austria (33.8) still remain at the lower ranks of inequality, countries like the UK (40.9) and Ireland (41.6) are estimated to be at the highest. Lastly, after the rest of the social transfers are paid, inequality drops even lower, rearranging the ranking of income inequality among the countries of the EU15. Finland (25.3) and Belgium (26.0) now present the lowest levels, whereas Spain (34.1) and Portugal (33.5) take the highest places.

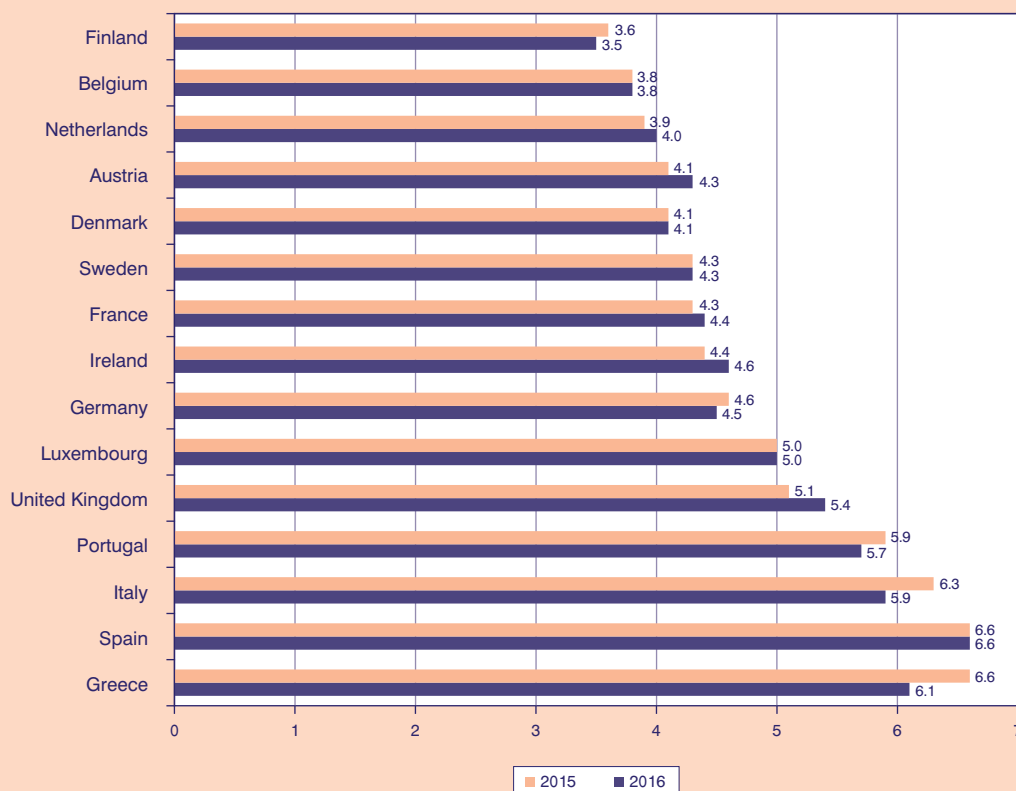
FIGURE 3.2.1
***Gini* index, before and after social transfers, EU15, 2016**



Source: Eurostat, EUSILC.

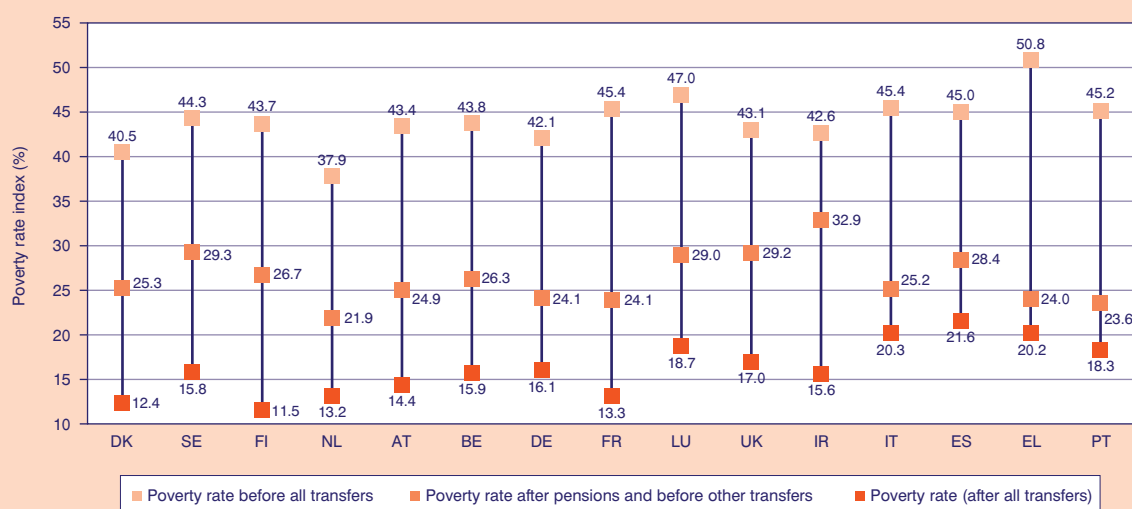
4. Cowell F. A. (2011), *Measuring inequality*, 3rd edition, Oxford University Press.

FIGURE 3.2.2
Income quintile share ratio (s80/s20), 2015 and 2016, EU15



Source: Eurostat, EUSILC.

FIGURE 3.2.3
The poverty rate index, before and after social transfers, 2016, EU15



Source: Eurostat, EUSILC.

An additional index used to record inequality is the income quintile share ratio (s_{80}/s_{20}). Based on the definition of personal income as stated above, we take a further step, ranking the population from the poorest to the wealthiest households, creating five equally populated groups. As a measure, the ratio of the fifth, wealthiest, quintile over the first, poorest, captures the difference between the two extremes. Thus, the higher the value of the index, the greater the distance between the two shares of the distribution, meaning that inequality is exacerbated. Accordingly, Figure 3.2.2 above presents the index of income distribution between the two quintiles for the years 2015 and 2016 and for all countries of the EU15, as it is measured by the EUSILC. According to the EUSILC 2017 survey, the inequality index is lower for Finland (3.5), Belgium (3.8) and the Netherlands (4). On the contrary, higher values are calculated for Spain (6.6), Greece (6.1) and Italy (5.9). In addition, an important issue has to do with the fact that, from 2015 to 2016, the relation between the two quintiles improved in Italy, Portugal and Greece, whereas the most significant increases have been found for the UK and Ireland.

An additional qualitative aspect of income distribution is presented by the poverty rate index. According to this conventional measure, the rate of poverty is calculated as the part of the population whose level of disposable income is less than 60% of the median. Following the distinction between pensions and other social transfers, Figure 3.2.3 above depicts the rates of poverty for 2016, as calculated before and after pensions and other transfers have been realized. While Greece is estimated to have the highest poverty rate

before all transfers (50.8%), at the same time, the impact of pensions seems to have been of utmost importance since the index was reduced by 26.8 percentage points. On the contrary, the contribution of the rest of the transfers seems to be relatively minimal, since the rate of poverty ends up at 20.2%, i.e., reduced by just 6.6 percentage points. Apart from Greece, Spain, Italy and Portugal, in the rest of the EU15 countries, the contribution of pensions and of social transfers in the reduction of income poverty is –more or less– of equal value. For example, in the case of Ireland, it has been observed that pension payments contribute less than the rest of the social expenditures put together.

3.2.3. Conclusions

EUSILC micro-data allow for the construction of indices that assist us in evaluating the level of income inequality in the EU15. The above presentation makes it apparent that the degree of inequality among the countries of the EU15 has been significantly varied. One of the main differences between the systems of social welfare is that the overall impact of social expenditures depends on the internal design and fabrication that exists in each one of them. In Italy, Spain, Greece and Portugal, the role of pensions is extremely important, whereas in countries like Denmark, Sweden, Finland, the Netherlands and the UK, the impact between pensions and the other social transfers is clearly more balanced. Finally, between 2015 and 2016, in the countries of southern Europe, the distance between the upper and the lower quintiles of income was limited.

4. Development policies and sectors

KEPE, *Greek Economic Outlook*, issue 39, 2019, pp. 42-46

4.1. Analysis of trends and fundamentals of tourism in Greece

Nikolaos Vagionis

Nikolaos Rodousakis

The year 2018 was excellent for tourism in Greece. This is confirmed by all official sources: arrivals, including cruises, recorded the best performance in the history of Greek tourism, surpassing 33 million, and also it was a great year for revenue. This article presents and analyses turnover in the sector of tourism and, then, of the relevant international travel re-

ceipts, over time and by country, and draws specific conclusions.

4.1.1. Breakdown of tourism turnover

For this approach, our analysis uses the Turnover Index in the Accommodation and Catering economic sector.¹ By analyzing² the modeling by year and quarter, and also with the help of Charts 4.1.1 and 4.1.2, it can be observed that:

As shown in Table 4.1.1, with the new base of 100 for 2015,³ during the last years, the average annual turnover index recorded a steady upward trend, reaching 118.9 in 2018. Starting, now, the analysis from 2010 with the annual turnover index recording 111.1, a phase of turnover reduction is easily observed. In 2011 the average annual index fell to 99.3, and in 2012 to 78.8,

TABLE 4.1.1 Turnover Index in Accommodation and Catering
Annual and quarterly averages, Base 2015=100

	Average annual	Q1	Q2	Q3	Q4
2010	111.1	84.0	112.3	163.2	84.8
2011	99.3	69.2	112.7	151.5	64.0
2012	78.8	49.1	82.3	132.3	51.3
2013	82	44.8	84.5	133.4	65.4
2014	92.8	55.1	92.3	149.4	74.2
2015	100	59.7	105.1	165.2	70.0
2016	100.8	53.2	105.0	177.3	67.7
2017	109.1	50.3	110.6	203.0	72.5
2018	118.9	55.2	122.7	223.2	74.4

Source: Greek Statistical Authority.

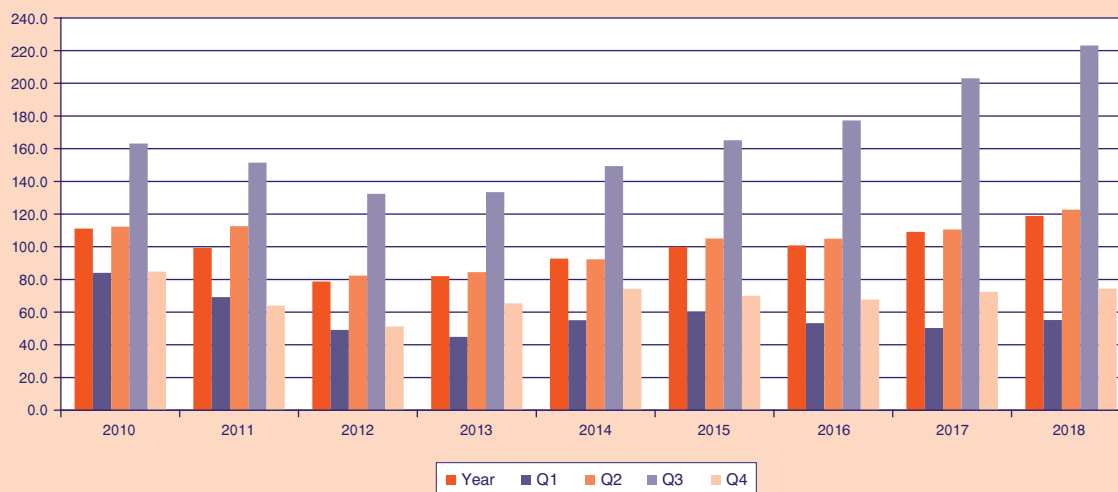
1. Greek Statistical Authority, *Turnover Index in the Accommodation and Catering economic sector Fourth Quarter 2018*. Piraeus, March 2018.

2. The Index, according to NACE rev. 2, has been described in detail in: *Greek Economic Outlook* V. 20, "4.1. Recent developments in the tourism sector in Greece" and is presented in all subsequent analyses.

3. The previous base was 2010, see e.g. *Greek Economic Outlook* V. 20, "4.1. Recent developments in the tourism sector in Greece" and is presented in all subsequent analyses.

CHART 4.1.1

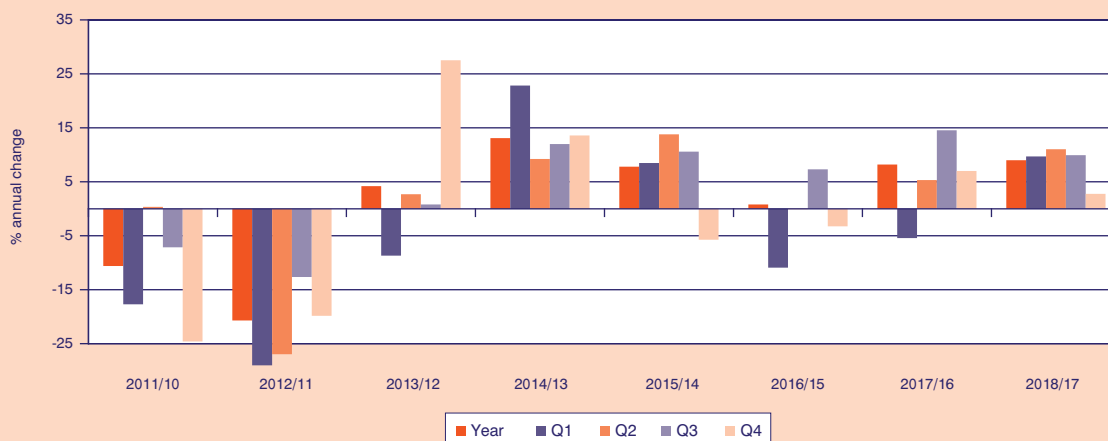
Greece: Turnover Index in Accommodation and Catering 2010-2018
Annual and quarterly averages, Base 2015= 100



Source: Greek Statistical Authority.

CHART 4.1.2

Greece: Turnover Index in Accommodation and Catering 2010-2018
% change of the annual and quarterly indices



Source: Greek Statistical Authority.

when the lowest average annual value of the turnover index was recorded –with a total decrease of 20% compared to 2011.

The downward trend continued until the first quarter of 2013. Starting with 2013 (see Chart 4.1.2 and Table 4.1.1), a continuous increase is recorded. The percentage change of the average annual Index from 2012 to 2013, when the index rose to 82.0, was 4.2%. This trend continued in 2014, with the annual index

rising to 92.8, an annual increase of 13.1% compared to 2013, and continued more in 2015 with an annual increase of 7.8% compared to 2014. The years 2016 and 2017 were characterized by increases in the average annual turnover index to 100.8 and 109.1, respectively. Finally, in 2018, which according to the Ministry of Tourism was the “best year in performance in the history of Greek tourism”, the average annual turnover increased by 9.0% to 118.9.

At this point, it is worth noting, acknowledging at the same time the season that ended, that the number of tourists increased by 9.7% (33 million in 2018 compared to 30 million in 2017). However, this increase was not accompanied by a corresponding increase in spending per night, which stood at €70 in 2018 compared to €69 in 2017, while average expenditure per trip remained virtually unchanged at €486 in 2018 against €485 in 2017. Lastly, the average length of stay decreased by 1.5% compared to 2017 and stood at 7 nights.

Finally, it is important to note that Q4 and Q1, “off-peak” quarters of each year, showed the largest decline in the period under review (see Table 4.1.1 and Charts 4.1.1 and 4.1.2) and are still significantly far from the levels of the pre-crisis period. This fact highlights the high seasonality of the tourist phenomenon in the country, despite that according to the provisional data of the Bank of Greece, the tourist receipts, which will be discussed below, recorded an increase of 53.2% in January 2019 and amounted to €232 million.

4.1.2. Analysis of international tourist receipts, over time and by country of origin

Beyond the turnover index, if we now proceed to systematically analyse recent travel receipts,⁴ we can have a good indication of the revenues due to travel expenditure in the country and the corresponding trends from a variety of selected countries of origin.

As shown in Table 4.1.2, but also more graphically in Chart 4.1.3, the receipts from international tourist traffic originating from selected geographic regions and countries can be summarised as follows:

Analysis of total international tourism receipts, over time

After the receipts of €11.6 billion in 2008, there has been a drop in the country’s international tourism receipts. This decline was significant in 2009 and continued in 2010 when the lowest value was recorded at €9.6 billion. The years 2011 (€10.5 billion) and 2012 (€10.0 billion) were years of stabilization, and from

TABLE 4.1.2 Greece: International tourism receipts; Total and selected regions and countries
Years 2008-2018 (In million euros)

	Total	Eurozone	Rest EU	UK	Russia	USA	Switzerland	Australia	Canada
2008	11,636	5,644	1,087	1,869	400	726	283	160	187
2009	10,400	5,091	1,004	1,624	301	568	304	180	144
2010	9,611	4,554	910	1,244	496	599	265	147	134
2011	10,505	4,975	922	1,205	743	532	349	165	172
2012	10,442	4,340	809	1,419	944	426	297	156	132
2013	12,152	4,861	964	1,355	1,339	569	333	177	259
2014	13,393	5,451	1,239	1,553	1,157	655	338	239	164
2015	14,126	6,009	1,375	2,019	421	943	375	237	223
2016	13,207	5,580	1,573	1,944	436	728	336	182	141
2017	14,630	6,296	1,511	2,065	418	814	341	395	179
2018	16,086	7,102	1,969	1,937	341	1,040	399	362	365
Total '08-'18	136,188	59,904	13,365	18,236	6,996	7,601	3,620	2,401	2,100
Regional percentage		44.0%	9.8%	13.4%	5.1%	5.6%	2.7%	1.8%	1.5%

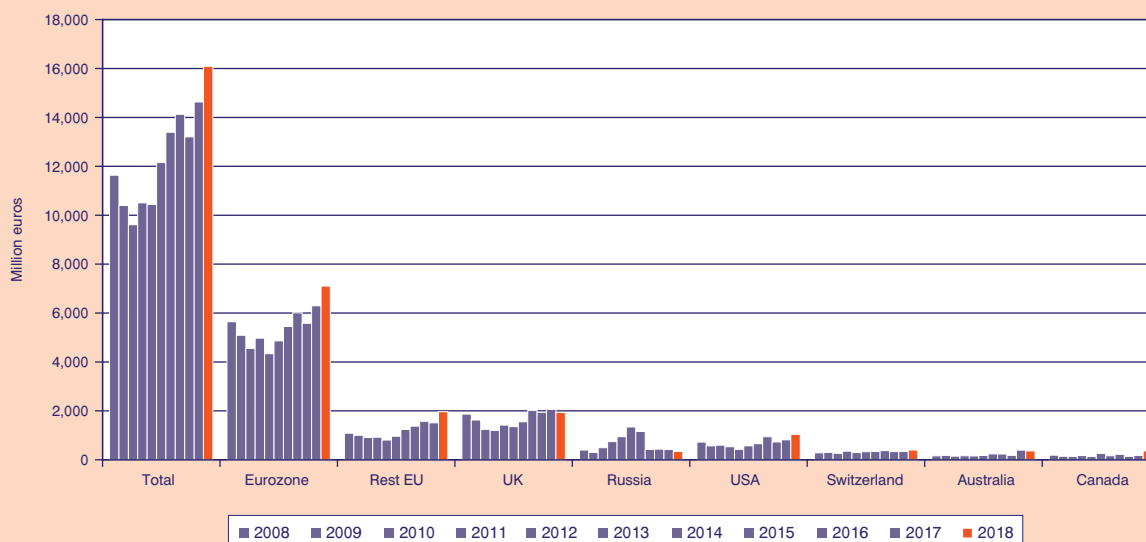
Source: Bank of Greece.

Note: Since 2010 the “Total” also includes the receipts from cruises.

4. Bank of Greece, *Bulletin of Conjunctural Indicators*, v.185: March-April 2019, May 2019.

CHART 4.1.3

Greece: International tourism receipts: Total and selected regions and countries
Years 2008-2018 (in million euros)



Source: Bank of Greece.

2013 there was an increase in revenues to €12.1 billion, which continued in 2014 to €13.4 billion, and to €14.1 billion in 2015. There was a retreat to €13.2 billion for 2016, with a steady upward trend for the years 2017 and 2018, which reached €14.6 billion and €16.1 billion, respectively.

The result of recent years reflects, partly, tourism development, infrastructure, local and international marketing and the potential improvement of the tourist product mix within the country as well as the planning of the Ministry of Tourism for “Greece – 365 days a year tourist destination”. It is also due, and to the extent that it has been achieved, to a more effective recording of tourism receipts, a factor of particular importance for the economic development of the country. Finally, it is due, in part, to economic growth in foreign markets (the origins of incoming tourists), to the country’s favourable political conjuncture within the turbulent landscape of the southeastern Mediterranean, and of course to the continuing international growth in global tourism.

Analysis of international tourist receipts, by region

The Eurozone

Analyzing the origin of receipts for the 11 years from 2008 to 2018 (see Table 4.1.2 and Chart 4.1.3), we note that, against the total of €136 billion, the receipts

from the Eurozone amounted to €59.9 billion. In the 11-year period, 44.0% of Greece’s international travel receipts come from Eurozone countries.

On an annual basis, collections amounted to €5.64 billion in 2008, declining steadily to €4.34 billion in 2012, while in recent years they have increased significantly, reaching €7.10 billion in 2018.

Finally, the percentage of participation of Eurozone countries in the total tourist receipts of Greece has been systematically decreasing, although it shows increasing trends. In 2018 it was 44%, lower than the 48% in 2008.

EU countries outside the Eurozone

Tourist receipts from tourists from EU countries outside the Eurozone amounted to €13.4 billion over the same 11-year period, or 9.8% of total receipts. This course is encouraging, as from €1.09 billion in 2008, and after a significant fall, they recovered to €1.38 billion in 2015, to €1.57 billion in 2016 and to €1.97 billion in 2018. The UK is not included in this group of countries, not only because of the decision to separate from the EU, but also because of the UK’s special importance for Greek tourism.

The United Kingdom

The UK is a traditional country of origin for tourism in Greece. In the 11-year period, €14.2 billion have

been spent in the country by British tourists, accounting for 13.5% of total receipts. The UK tourist receipts amounted to €1.87 billion in 2008, after falling back to €2.02 billion in 2015 and remained at €1.94 billion in 2016. However, there is a clear stagnation in our country's favorable market approach. Greece's contribution to international tourist receipts from the UK was 18.9% in 2008 and gradually declined to 18.2% in 2018.

Russia

Receipts from tourist traffic coming from Russia amounted to €7.0 billion from 2008-2018, which corresponds to 5.1% of total tourist receipts. However, there is considerable variation. More specifically, in 2008, receipts amounted to €0.4 billion, while in the following years they increased steadily, reaching €0.74 billion in 2011 and €1.34 billion in 2013. However, there was a significant decline, for a variety of political and economic reasons, not related to the tourist offer from the part of Greece. But clearly much more can be done for us to take advantage of this market, which –as it has shown– has great potential. Thus, in 2016 the receipts were €0.44 billion and in 2017 were €0.42 billion, while in 2018 receipts decreased, reaching €0.34 billion.

The USA

The travel receipts from the US that were recorded for the 11-year period were €7.60 billion, which accounts for 5.6% of total tourist receipts and is relatively stable. In 2008, they amounted to €0.73 billion, but in the following years there was a slight decrease to €0.53 billion in 2011 and to €0.57 billion in 2013. Then there was a recovery, so in 2016 the receipts were €0.73 billion and in 2017 the receipts were €0.81 billion, while in 2018 they increased significantly to €1.04 billion.

Switzerland

In the 11-year period, €2.9 billion have been spent by Swiss tourists in the country, which represents 2.7% of total receipts. Tourist revenues from Switzerland were recorded at €0.28 billion in 2008, rising to €0.34 billion

in 2016 and stabilizing at €0.34 billion in 2017, while in 2018 they increased significantly to €1.04 billion.

Australia - Canada

Tourist receipts from Australia that were recorded for the 11-year period were €2.4 billion, which accounts for 1.8% of total tourist receipts. The annual tourist receipts show a great increase from €0.15 billion in 2010 to €0.24 billion in 2015, down to €0.18 billion in 2016, and up to €0.39 billion in 2017. In 2018, they remained high at €0.36 billion, thus maintaining the sharp rise in tourist receipts from Australia in the previous tourist season.

The travel receipts from Canada that were recorded for the 11-year period were €2.1 billion, which accounts for 1.5% of total tourist receipts. The annual tourist receipts for the last 11 years fluctuate without any upward trend, from €0.134 billion in 2010 to €0.22 billion in 2015, to €0.14 billion in 2016, and again to €0.18 billion in 2017. In 2018 travel receipts more than doubled, jumping to €0.364 billion –an impressive increase from this important country.

4.1.3. Conclusions

In this article we have analyzed the Turnover Index in the Accommodation and Catering Services sector as well as the international tourist receipts, over time and by country. The results showed that the value of tourist receipts amounted to €16.1 billion, while in 2017 this value was €14.6 billion, reaching historically high levels. This increase in travel receipts was not caused by the increase in average expenditure per trip; however, it is caused by the increase of inbound travelers in 2018, which was also historically high. This revenue from travel receipts offset the balance of goods deficit by 72% and contributed 44% to total net receipts from services. Finally, the projections for 2019 are positive, since the first data for this year show that this positive momentum for Greek tourism seems to remain.

4.2. Breakthroughs in development financing: The Hellenic Development Bank

Konstantinos Loizos

4.2.1. Introduction

Development banks form a particular type of financial institution which traces back to industrial financing in 19th century France and Germany. However, these banks became widely known and spread out after the Second World War, during the reconstruction of war-torn economies around the world. In post-war Greece, development banking was initially operated by the Economic Development Financing Organization (EDFO) (1954-1964) and the Industrial Development Corporation (IDC) (1960-1964). Eventually, three development banks were established (1963-2002): the Hellenic Bank of Industrial Development (ETBA), the National Investment Bank for Industrial Development (ETEBA) and the Investment Bank (TE). Contrary to the Greek case, in which development banks ceased to exist as of 2002, in many countries, development or investment banks adapted their double role of financial and economic development by providing long-term financing to the economy and boosting institutional development. The recent global financial crisis and the ensuing recession rendered development banking topical, in combination with the anticyclical credit policy which was followed in many countries.¹ In this context, Greece set up the Hellenic Development Bank (HDB), whose features are described in the next sections.

4.2.2. The Hellenic Development Bank in the current conjuncture

The Greek economy experienced a protracted economic recession during the last decade, which revealed the serious weaknesses of its productive model and the urgent necessity to transform it. The HDB should be able to play a significant role in this affair, as a crucial promoter of a multifaceted development process. According to the Explanatory Statement of the relevant bill,² the point is the restructuring of the productive system of the country within a *holistic* development process which satisfies the economic, social and environmental dimensions of development altogether. Consequently, the HDB will seek to fill a gap in development banking in Greece which has existed for the last seventeen years, despite international experience and the significance attributed to national development banks by the European Commission.³ In addition, the nascent development bank should operate as an “institutional accelerator”, a major agent of the Greek polity in promoting a development model characterized by efficiency and sustainability.

4.2.3. Aims and directions of activity for the HDB

According to its founding legal framework,⁴ the HDB integrates its strategy in the context of national development policy by orientating its activity towards the satisfaction of a series of intermediate targets such as: supporting entrepreneurship, developing financing instruments with a special emphasis on new-innovative and Small and Medium Enterprises (SMEs), promoting the innovation and competitiveness of enterprises, providing consulting services to the private and public sectors of the economy, encouraging a Social Solidarity Economy and, in general, the emergence of the

1. *The Economist* (2019), “National Development banks are back in vogue”, March 7; De Luna-Martínez, J. (2017), “Findings of the 2017 Global survey on Development Banks”, Presentation at the *World Bank Group Global Knowledge and Research Hub*, Malaysia, September 19.

2. Explanatory Statement on the bill of the Ministry of Economy and Development, “Hellenic Development Bank and attracting of Strategic Investments and other provisions”, April 8th, 2019 (in Greek).

3. *European Commission* COM (2015) 361, “Working together for jobs and growth: The role of National Promotional Banks (NPBs) in supporting the Investment Plan for Europe”. Communication from the Commission to the European Parliament and the Council.

4. “Hellenic Development Bank and attracting of Strategic Investments and other provisions”, passed Bill, Hellenic Parliament, Minutes of PIB, April 17th, 2019 (in Greek).

HDB's role as a significant attractor of capital as well as a promoter of investment projects.

Eventually, the Hellenic Development Bank aims at a multifaceted support of enterprises that are active in leading sectors of the Greek economy, especially those that are new, developing, exporting and their products are of high value added. Also, the majority of them are SMEs that have difficulty in accessing external sources of financing. Furthermore, the HDB broadens the scope of its activity thereby including the support of local authorities' development projects as well as the Social and Solidarity Economy. The composite role of the HDB is not exhausted in supporting the above mentioned economic and social units to obtain financing for their projects. The HDB should also be able to carry out studies by sector and industry. Additionally, it will seek to disseminate its know-how in issues of economic planning along with its offering of consulting services to firms and the state. Finally, it is within the duties of the new development bank to coordinate public developmental agencies and cooperate with financial institutions, public policy agents and research institutes.

In the above context, the HDB has to launch a series of actions, such as:

- Providing credit to businesses through third parties (other funding bodies). It should be noted that the HDB will not have the ability to grant loans directly.
- Providing guaranties to firms against their obligations to other financial institutions.
- Designing and implementing instruments of financial engineering which serve the purpose of the bank.
- Targeted financing of businesses aiming at their restructuring towards improving their effectiveness, innovation and competitiveness.
- Participating in various financing mechanisms and bodies in order to serve its purpose along with developing cooperation with international investment organizations.
- Supporting new and innovative entrepreneurship and businesses that are export-oriented.
- Financially supporting scientific research and studies at the enterprise level to the degree that they promote firms' productive efficiency.
- Accommodating the financing of institutions that encourage social cohesion and economy as well as advancing alternative ways of funding, such as microcredit.
- Providing firms (especially SMEs) and other bodies with consultancy, dissemination of know-how con-

cerning a wide range of issues such as designing financing instruments, business restructuring, capital structure, organization and corporate governance, human resource management, formulating investment projects, etc.

- Writing macroeconomic and microeconomic studies in various sectors of the economy so that policy makers can spot financing needs and fill in the gaps in institutional development caused by market deficiencies.

4.2.4. The distinctive character of the HDB

At this point it should be obvious that the HDB is structured as an organization with particular characteristics. It aims at maximizing developmental and socioeconomic returns. On the other hand, it should be financially sound in order to be able to fulfill successfully its mandate. In this sense, the HDB should aim at increasing the value of its assets so as to succeed in its double goal of being financially viable and socioeconomically efficient. For this reason, it is provided that the government will have a majority stake in the capital of the HDB and, at the same time, the bank will operate as a private firm, which would be self-financed and whose pricing policy would follow market practices. On the top of this, the HDB should follow the basic principles of corporate governance and the best practices which ensure transparency in its activity whilst, at the same time, it should function with private economic criteria.

Finally, the HDB will be a multifaceted developmental agency with three major dimensions: 1) the *financing* dimension, which refers to the conclusion of loan contracts and the granting of guarantees; 2) the *administrative* dimension, which pertains to the use of financial engineering instruments and the implementation of funding programmes; and 3) the *consultative* dimension, which relates to the dissemination of know-how and conducting research or writing studies. In any case, the HDB will operate as a complement of incumbent financial institutions rather than as their competitor, since it will be active in areas where existing banks cannot fulfill their role. Alternatively, one might say that the HDB pursues a guiding role in development financing.

4.2.5. Conclusions

The Hellenic Development Bank was founded during a critical era for the Greek economy, in agreement with the long international experience which indicates that development banks play a pivotal role in crucial mo-

ments in economic history throughout the world. In this sense, it is considered the appropriate mechanism to act as a developmental catalyst in the Greek economy, which needs a new productive model. Moreover, development banks have always been engaged in a double role of financing targeted investment projects and emphasizing and promoting the institutional preconditions of economic development. Certainly, the success of this venture depends on how clearly the

objectives of the HDB have been defined, the quality of its staff and its corporate governance. However, the greatest challenge for the Hellenic Development Bank is the balanced satisfaction of the criteria of its efficiency in terms of financial viability and socioeconomic returns. Only in this case, will the HDB be able to fulfill credibly, effectively and transparently its task as a critical arm of the national strategy for inclusive and sustainable development.

4.3. Developments in the Greek agricultural sector

Ioanna Reziti

4.3.1. Introduction

The following analysis presents an overview of the major developments in the economics of Greek agriculture. Reference is made to some economic figures of agriculture, using data from Eurostat over the last decade. Based on this, we provide a quick update on issues such as farm structure, farm income, employment, input costs and production value.

Greek agriculture, as we shall see, showed great resilience to the crisis and the prolonged recession of the Greek economy. According to Eurostat figures, over the period 2008-2017 agricultural output increased by 6%, while the output of all other sectors of the economy decreased by 27%. The diversity of Greek agriculture urges us not only to promote competitiveness, but also traditional agriculture and small farms.

4.3.2. The importance of Greek agriculture

The contribution of the agricultural sector to the Greek economy, expressed as the percentage of agricultural product in the Gross Domestic Product (GDP), increased from 3% in 2007 to 6% in 2017, fictitious mainly due to a large GDP decline of 23%. Gross Value Added (GVA) in agricultural production declined (4%) over the period 2007-2017 due to the increased cost of farm inputs and the fall in production value. Significant reductions in GVA are 16% in 2011 and 18% in 2013, attributable to increases in intermediate consumption by 9% and 11%, respectively. However, the participation of the GVA of agriculture in the country's GVA increased from 3% in 2007 to 3.7% in 2017. Also, the share of agricultural employment in total employment remained stable (11%). The importance of the sector is also strengthened by the area of the main rural areas and by the size of their population, compared to the intermediate and urban areas, with rates of 66% and 40%, respectively. Also, the contribution of agricultural products to the external trade balance of the country is important. In 2017, the value of agricultural exports amounted to 5.5 billion euros, covering 19% of the total value of its exports.

4.3.3. Gross production value in Greece and the EU

Within the EU-28, the participation of the Greek agricultural sector shows a downward trend, as shown in Table 4.3.1, due to a fall in Gross Value Added of 4.3%. Greece

TABLE 4.3.1 Participation of the agricultural sector in the EU-28 (% Total GVA)

	2007	2010	2013	2017
Belgium	1.6	1.6	1.3	1.3
Bulgaria	0.8	0.9	1.0	1.0
Czech Republic	0.8	0.6	0.8	0.9
Denmark	1.6	1.7	1.6	1.7
Germany	10.0	11.0	12.4	11.1
Estonia	0.2	0.2	0.2	0.1
Ireland	1.1	0.9	1.2	1.7
Greece	3.8	3.6	2.9	3.1
Spain	15.7	14.5	13.2	15.3
France	18.2	18.1	15.4	15.7
Croatia	0.8	0.9	0.6	0.5
Italy	17.5	17.2	19.2	17.0
Cyprus	0.2	0.2	0.2	0.2
Latvia	0.2	0.2	0.1	0.2
Lithuania	0.5	0.4	0.6	0.7
Luxemburg	0.1	0.1	0.1	0.1
Hungary	1.4	1.3	1.7	1.9
Malta	0.0	0.0	0.0	0.0
Netherlands	5.9	6.2	5.9	6.3
Austria	1.7	1.7	1.6	1.7
Poland	5.1	5.3	5.5	5.7
Portugal	1.6	1.7	1.5	1.5
Romania	3.9	4.3	4.4	4.1
Slovenia	0.3	0.3	0.2	0.2
Slovakia	0.3	0.2	0.3	0.3
Finland	0.9	0.9	0.7	0.6
Sweden	1.0	1.0	0.9	1.0
United Kingdom	4.8	5.1	6.3	6.1

Source: Eurostat, *National accounts*.

TABLE 4.3.2 Gross value of agricultural production in producer prices

	2007	2010	2013	2017	2007	2010	2013	2017
	Millions €				% of EU-28			
EU-28	330,286	335,683	388,747	389,279	100	100	100	100
Belgium	7,242	7,578	8,432	8,211	2.2	2.3	2.2	2.1
Bulgaria	2,753	3,155	3,712	3,605	0.8	0.9	1.0	0.9
Czech Republic	4,064	3,821	4,708	4,684	1.2	1.1	1.2	1.2
Denmark	8,539	9,075	10,268	10,326	2.6	2.7	2.6	2.7
Germany	44,493	47,569	56,791	52,989	13.5	14.2	14.6	13.6
Estonia	621	592	830	784	0.2	0.2	0.2	0.2
Ireland	5,727	5,513	7,346	8,056	1.7	1.6	1.9	2.1
Greece	9,623	9,355	9,252	10,038	2.9	2.8	2.4	2.6
Spain	39,447	38,106	41,855	48,107	11.9	11.4	10.8	12.4
France	59,343	61,138	66,856	64,759	18.0	18.2	17.2	16.6
Croatia	2,389	2,387	2,163	1,967	0.7	0.7	0.6	0.5
Italy	41,641	40,660	48,338	45,376	12.6	12.1	12.4	11.7
Cyprus	607	654	666	681	0.2	0.2	0.2	0.2
Latvia	877	845	1,162	1,227	0.3	0.3	0.3	0.3
Lithuania	1,818	1,725	2,397	2,405	0.6	0.5	0.6	0.6
Luxembourg	313	307	390	390	0.1	0.1	0.1	0.1
Hungary	5,922	5,583	7,171	7,483	1.8	1.7	1.8	1.9
Malta	108	115	123	116	0.0	0.0	0.0	0.0
Netherlands	21,165	22,026	24,893	25,459	6.4	6.6	6.4	6.5
Austria	5,528	5,636	6,339	6,651	1.7	1.7	1.6	1.7
Poland	18,394	17,897	22,371	24,549	5.6	5.3	5.8	6.3
Portugal	5,696	5,909	6,321	6,927	1.7	1.8	1.6	1.8
Romania	12,676	13,903	16,092	15,690	3.8	4.1	4.1	4.0
Slovenia	1,087	1,072	1,141	1,143	0.3	0.3	0.3	0.3
Slovakia	1,780	1,611	2,162	2,106	0.5	0.5	0.6	0.5
Finland	3,191	3,331	3,823	3,283	1.0	1.0	1.0	0.8
Sweden	4,532	4,651	5,622	5,616	1.4	1.4	1.4	1.4
United Kingdom	20,710	21,470	27,522	26,650	6.3	6.4	7.1	6.8

Source: Eurostat, *National accounts*.

ranks ninth in the EU-28 in terms of total agricultural output (€10 billion in 2017), contributing 2.6% of EU-28 (Table 4.3.2). This percentage is quite low compared to other Mediterranean countries, such as Italy and Spain, who contribute 12.4% and 11.7%, respectively. In the period 2013-2017, the value of agricultural production increased by 8.5% due to a 17% increase in crop pro-

duction. On the contrary, the value of livestock production showed a significant drop of 6.5%. This change results in the relationship between crop and animal production changing from 70/30 in 2013 to 75/25 in 2017, while in the EU-28 the corresponding ratio is 43/57. This unequal proportion that prevailed in 2000 is still one of the structural problems of Greek agriculture today.

4.3.4. Farm structure and labor force

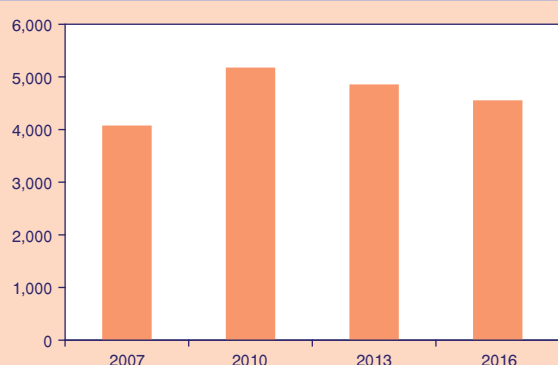
According to Eurostat data on the structure of farms in 2016 compared to 2007, the utilized agricultural area increased by 12%, with the highest increase (27%) in the three-year period 2007-2010 (Diagram 4.3.1). However, during the period 2010-2016 there was a fall of 12% at an average annual rate of -0.02%. On the contrary, the number of farms in 2016 amounted to 684,950 thousand, which, compared to 2007, showed a significant decrease (20%) (Diagram 4.3.2) and an average annual rate of -0.03%. However, a significant part of this decline (16%) is observed in the three-year period 2007-2010. As a result, the average size of holdings increased: 4.74ha (2007), 7.16ha (2010), 6.85ha (2013), and 6.65ha (2016), but, as we see, it remains roughly stable at 7 ha in 2010. This average size

compared to the European average (14.3ha) is clearly lower (around half of the European average).

With regard to the distribution of agricultural land by size class of agricultural holdings (AH), small-sized holdings (up to 9.9ha) account for 31% of agricultural land used, medium-sized holdings (10-29.9 ha) account for 19% and the remaining 50% is used by large-sized holdings (> 30ha) (Diagram 4.3.3).

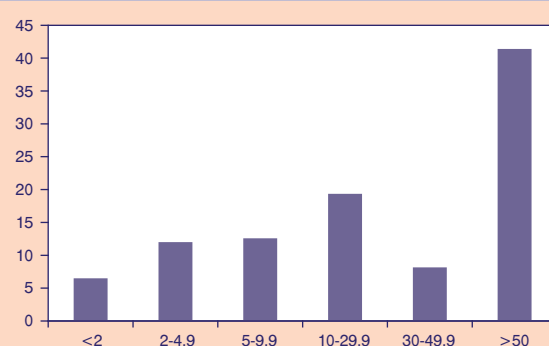
Small-sized holdings make up 88.6% of all AH, a percentage that did not change since 2007 (88.5%). Small holdings should be classified as parcels, rather than actual commercial holdings, that provide supplementary income to their owners (non-professional farmers). These figures show that the restructuring of Greek agriculture has been quite relaxed over the last 10 years. By contrast, at the EU-28 level, small and

DIAGRAM 4.3.1
Utilized agricultural area (in thous. ha)



Source: Eurostat, Farm structure.

DIAGRAM 4.3.3
Distribution of agricultural holdings by physical farm size, 2016 (ha)



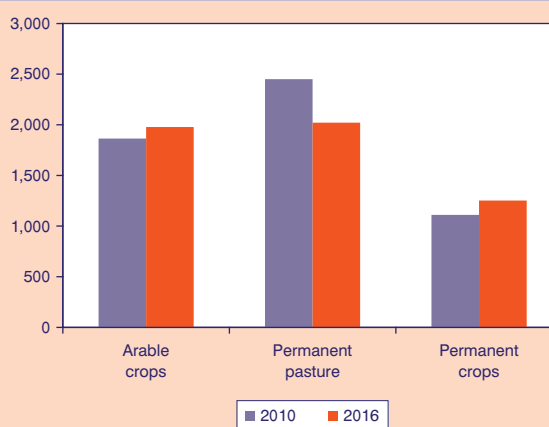
Source: Eurostat, Farm structure.

DIAGRAM 4.3.2
Number of agricultural holdings (thous.)



Source: Eurostat, Farm structure.

DIAGRAM 4.3.4
Distribution of utilized agricultural area



Source: Eurostat, Farm structure.

medium-sized farms make up only 25% of agricultural land, while large-scale farms account for 75%.

Used agricultural area means the total area occupied by arable land, permanent pasture, permanent crops and family vegetable gardens. In 2016, arable land and pastures each use 38% of agricultural area, permanent crops 24% and family gardens a very small

percentage. In 2016, compared to 2010, there is a large decrease of pasture lands, by 18%, and an increase in arable land and permanent crops, by 6% and 13%, respectively (Diagram 4.3.4 above).

The “type of farming” (TOF)¹ of a holding shall be determined by the relative contribution of the standard output of the different characteristics of this holding

DIAGRAM 4.3.5

Distribution of agricultural holdings by general type of farming (GTOF), 2016

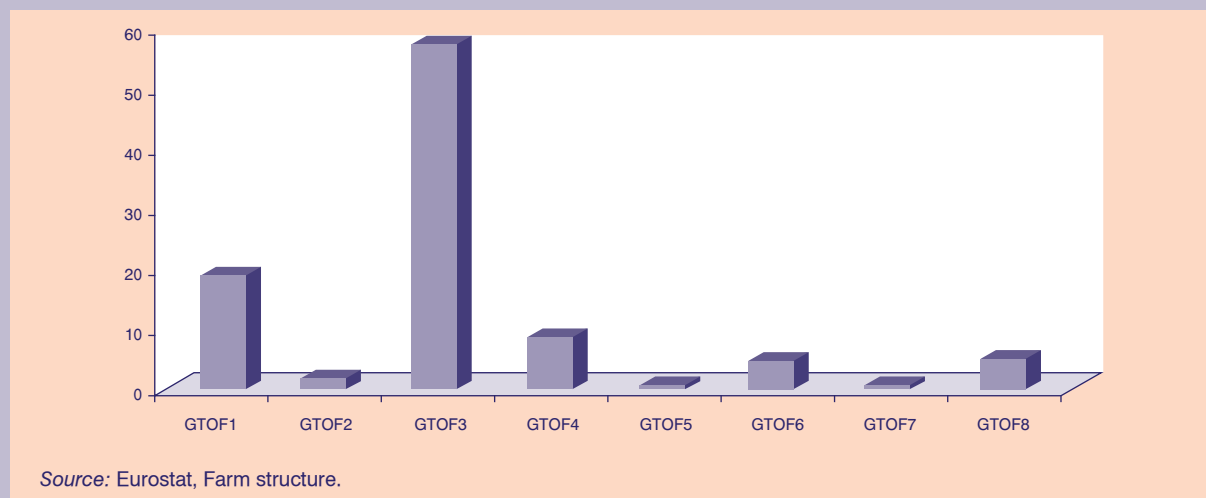
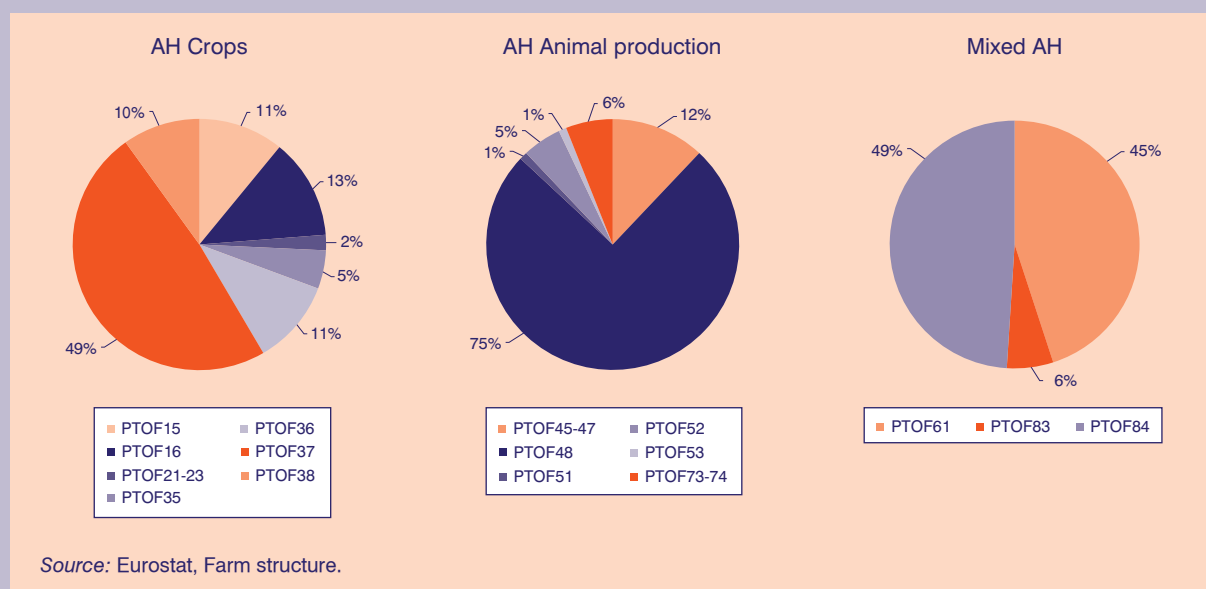


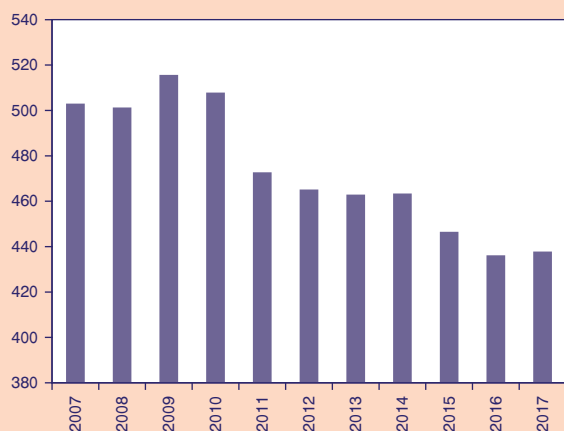
DIAGRAM 4.3.6

Distribution of agricultural holdings by principal type of farming (PTOF), 2016



1. Depending on the amount of detail required, the TOF shall be divided into the general categories (GTOF) which are: Specialist field crops (GTOF1), specialist horticulture (GTOF2), specialist permanent crops (GTOF3), specialist grazing livestock (GTOF4), specialist granivores (GTOF5), mixed cropping (GTOF6), mixed livestock (GTOF7), mixed crops-livestock (GTOF8), non-classified holdings (GTOF9).

DIAGRAM 4.3.7
Evolution of employment in agriculture
(1,000 persons)



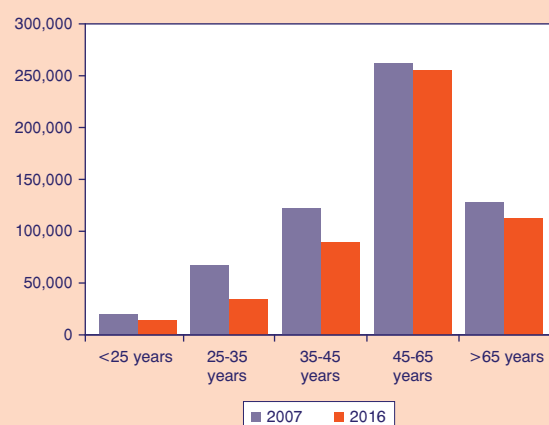
Source: Eurostat, *National accounts*.

to the total standard output of this one (Commission Regulation 1242/2008). This Regulation established the community typology and classification of AH. Diagram 4.3.5 above shows that holdings which are “specialist in permanent crops” (GTOF3) appear to dominate, with 58%, followed by “specialist in field crops” (GTOF1) with 19%.

The AH are distinguished into crops (80%), animal production (9%) and mixed holdings (11%) where the principal categories of TOF (PTOF) are shown in Diagram 4.3.6. It is noted that 49% of crops are specialized “Specialist olives” (PTOF37); from animal production, 80% are “sheep, goats and other grazing livestock” (PTOF48); and 49% from mixed holdings are “various crops and livestock combined” (PTOF84).

Concerning the employment of the labor force in the agricultural sector, in 2017 it represents 11% of the total employment in Greece and 5% of the agricultural employment of the EU-28. In the 2007-2017 decade, there is a 13% decline in the labor force, with the largest drop of 7% in 2011 compared to 2010 (Diagram 4.3.7). The age structure of agricultural employment (Diagram 4.3.8) shows that in 2016, individuals over 45 years of age comprised 77% of employment, while in 2007 the percentage was lower (65%). This means that while the significant employment rate has decreased, the percentage of farmers over 45 years of age was only down 6%. On the contrary, large reductions in employment, 59% and 30%, were observed for the ages 25-35 and 35-45, respectively, with the decrease (71%) in employment for individuals below the age of 25 indicating

DIAGRAM 4.3.8
Age distribution of agricultural employment
(AWU)



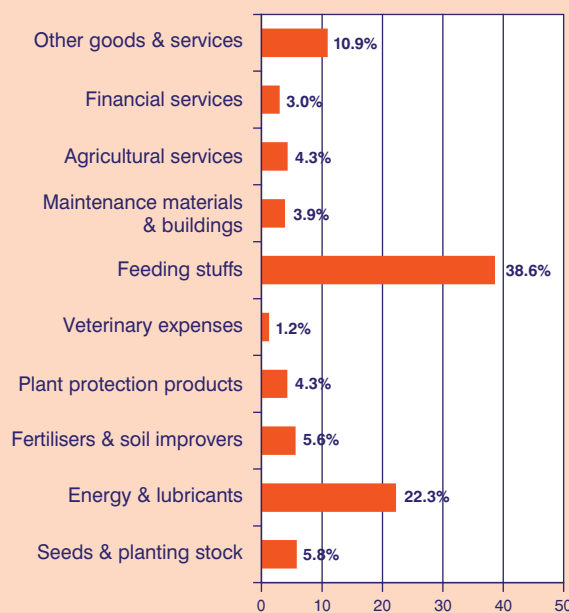
Source: Eurostat, *Farm structure*.

that the agricultural sector doesn't attract younger generations.

4.3.5. Input categories of agricultural production

Intermediate consumption is the total cost of inputs used in AH. It includes consumption of self-produced

DIAGRAM 4.3.9
Contribution of intermediate consumption
in the gross value of production, 2017



Source: Eurostat, *Economic accounts for agriculture*.

feed, purchases of goods and services for intermediate consumption from outside, for example, seeds and other propagating material, energy and lubricants, fertilizers and soil improvers, plant protection products, animal feed, veterinary costs, maintenance costs of buildings and others.

Intermediate consumption in 2007 was in the range of EUR 4.86 billion and accounted for 48% of gross production value, while in 2017 it stood at EUR 5.46 billion, up 12%, accounting for 52% of gross production value. This increase is important because it greatly affects the development of agricultural income. The highest cost of inputs (60%) is covered by feed (39%) and energy and lubricants (22%) (Diagram 4.3.9 above), with significant increases of 13% and 35%, respectively, in 2007-2017. An important increase is also observed (47%) for maintenance of buildings and materials and for plant protection (20%). Reductions were observed in veterinary ex-

penditure (13%) and in agricultural services (37%). However, between 2013 and 2016 there was a reduction in input costs of 2.5% due to a significant reduction in energy, by 21%, while an increase was observed in plant protection, by 15%.

4.3.6. Economic accounts, agricultural income

Agricultural income records a significant reduction (14%) during 2007-2017, at current basic input prices, with a large increase (13%) in 2013 compared to 2007 (Table 4.3.3). The increase in intermediate consumption by 12% resulted in the reduction of GVA by 4%. However, in the five-year period 2013-2017 there is a significant increase of 13% in agricultural income. There is also a very large increase in taxes on production, while a reduction in subsidies of 17% is recorded. Labor costs have also fallen by 46% due to rising input costs and reduced farm incomes.

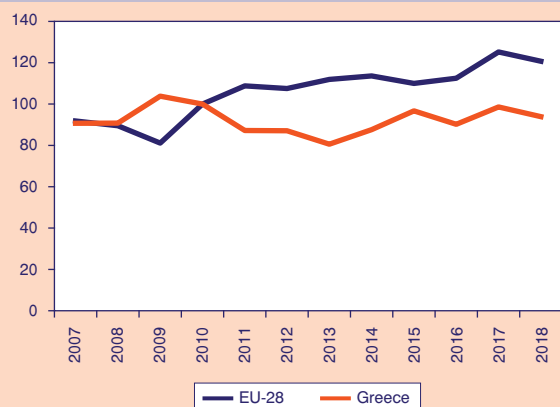
TABLE 4.3.3 Economic accounts for Greek agriculture, values at current prices
(in thous. €)

		2007	2013	2017	% 2017/2007	% 2017/2013
(1)	Output of the agricultural "industry"	10,929	10,365	11,272	3	9
(2)	Total intermediate consumption	4,861	5,401	5,465	12	1
(3)=(1)-(2)	Gross value added at basic prices	6,068	4,964	5,807	-4	17
(4)	Fixed capital consumption	1,337	1,397	1,210	-9	-13
(5)=(3)-(4)	Net value added at basic prices	4,731	3,567	4,597	-3	29
(6)	Other taxes on production	168	480	571	240	19
(7)	Other subsidies on production	2,835	2,558	2,353	-17	-8
(8)=(5)+(6)-(7)	Factor income	7,398	5,645	6,379	-14	13
(9)	Compensation of employees	1,026	627	551	-46	-12
(10)=(8)-(9)	Operating surplus	6,372	5,017	5,829	-9	16
(11)	Interest paid	155	153	158	2	3
(12)	Rents & other real estate rental charges to be paid	544	490	494	-9	1
(13)=(10)-(11)-(12)	Entrepreneurial income	5,672	4,372	5,176	-9	18

Source: Eurostat, *Economic accounts for agriculture*.

DIAGRAM 4.3.10

Trends in the real income of factors in agriculture per AWU Indicator A (2010=100)



Source: Eurostat, *Economic accounts for agriculture/agricultural income*.

Based on Eurostat's "Indicator A", expressed as actual agricultural income in real prices in terms of full-time employment in Annual Working Units (AWU), Greece, after 2010, is at a disadvantage compared to the EU-28 (Diagram 4.3.10). In 2009-2013, Greece's Indicator A has a declining trend but has been rising since 2013.

In contrast, the EU-28 indicator has been steadily rising since 2010.

Interestingly, developments in investments of AH are reflected by the size of the consumption of fixed capital. In 2017, fixed capital consumption amounted to EUR 1,210 million, down by 2.5% compared to 2007. This reduction had the effect of reducing its contribution to Gross Value Added from 22% in 2007 to 21% in 2017. This figure is below the EU-28 average (33%).

4.3.7. Conclusions

The developments highlighted above show the stagnation of Greek agriculture, which remains in a recessionary state. Increasing production costs, falling incomes, falling investment, reducing funding, reducing employment and increasing production taxes are new problems that add to the structural problems of Greek agriculture that still exist. The reconstruction of agriculture should be based on a long-term national plan that is documented by independent scientific analyses and consistently implemented by the governments concerned. Policy makers should design customized and specific objectives that address the complexity and needs of each region and farming activity.

4.4. External trade of agro-food products

Athanasios Chymis

4.4.1. Greece's overall external trade

In 2018, total exports (including petroleum products) significantly increased by 16.0%, reaching €33.46 billion, while total imports increased by 9.8%, reaching €55.19 billion. The total trade deficit increased by 1.4%, to €21.73 billion, up from €21.43 billion in 2017. The fact that the rate of growth of exports was much higher than that of imports is a positive development and it must remain this way if Greece does not want to repeat the rapid increase of its deficit every time there is economic growth.

Encouragingly, the data from ELSTAT show that the abovementioned increase of the total deficit (just €306 million) is due to the trade of petroleum products, the

deficit of which increased by €1.26 billion. In particular, petroleum products' imports rose to €15.99 billion, up from €12.21 billion in 2017, and their exports reached €11.49 billion, up from €8.97 billion in 2017. Given that a) Greece is a net importer of petroleum products and b) trade in petroleum products composes a big chunk (approx. 30%) of the total external trade, we are more interested in the Greek external trade after the trade of petroleum products has been excluded. This way, we can see the trade of all other products more clearly.

Total external trade (without petroleum products) seems to have a quite positive development in 2018. It is the first time in many years –probably decades– that the trade deficit does not increase during a year with a positive change of the GDP. It was only during the economic crisis that the Greek economy witnessed a decrease of the deficit as a result of the severe recession, which translated to a significant reduction of imports. Even the slight growth in 2014 (just 0.7%) triggered an increase of the trade deficit by €1.8 billion. Similarly, in 2017, when the economy grew by the modest rate of 1.5%, the trade deficit increased by €2.4 billion.

TABLE 4.4.1 Total trade and agro-food products trade (in billion €)*

	2008	2009	2011	2013	2015	2016	2017	2018	% annual change rate	% change 2017-2018
Imports										
Total	48.60	40.90	31.66	29.64	31.24	34.34	38.05	39.20	6.4 ('13-'17)**	3.0
Agro-food	7.05	6.40	6.46	6.54	6.31	6.62	7.00	7.05	1.5 ('10-'17)	0.7
Agro (%)	14.5	15.6	20.4	22.1	20.2	19.3	18.3	18.0		
Exports										
Total	15.46	13.03	15.89	16.67	17.90	18.53	19.86	21.97	5.4 ('09-'17)	10.6
Agro-food	4.01	4.00	4.50	5.42	5.72	6.14	6.10	6.49	5.4 ('09-'17)	6.4
Agro (%)	25.9	30.7	28.4	32.5	31.9	33.1	30.7	29.6		
Deficit										
Total	33.14	27.87	15.77	12.98	13.34	15.81	18.18	17.23	8.8 ('13-'17)	-5.3
Agro-food	3.04	2.40	1.96	1.12	0.60	0.49	0.90	0.55	-5.5 ('13-'17)	-38.1

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

* Excluding petroleum.

** The annual rate is calculated based on the year with the lowest performance.

4.4.2. Total trade (excluding petroleum) and agro-food trade

Export growth is the most important factor for reducing the rate of growth of the trade deficit and even putting trade deficit on a decreasing path. Table 4.4.1 above shows that in 2018 total exports increased by 10.6%, or €2.11 billion. Total imports increased by only 3.0%, or €1.15 billion. Consequently, the trade deficit decreased by 5.3%, or €0.96 billion. It is crucial for the Greek economy to keep its exports growing at a much larger rate relative to the growth of imports. This is the only way to keep the trade deficit under control given the current significantly larger value of imports compared to exports. However, this is not an easy task. After so many years of recession, even a modest growth is expected to increase demand which, in turn, will push imports up.

Focusing on the agro-food products trade, 2018 was a good year. Agro-food imports increased by just 0.7%,

or €49 million, while agro-food exports increased by 6.4%, or €390 million. Consequently, the agro-food trade deficit shrank by 38.1% to €554 million, down from €895 million in 2017. As this column has noted, agro-food exports had a much better performance during the crisis relative to all other product exports. It is a positive development that exports of other products have recently improved and outperform agro-food products. As a consequence, the share of agro-food exports to total exports fell below 30% (Table 4.4.1).

4.4.3. Geographical distribution of the agro-food trade

Table 4.4.2 presents the geographical structure of the agro-food trade. Imports have reached the pre-crisis (2008) levels, while exports have broken records many years since 2010. This translates to a cumulative growth of agro-food exports of 62% since 2009, the year with the lowest exports value. The direct results of these de-

TABLE 4.4.2 Geographical distribution of agro-food trade (in million €)

	2008	2009	2010	2012	2014	2016	2017	2018	% annual change rate 2008-2017	% change 2017-2018
Imports										
Total	7,054	6,396	6,299	6,335	6,488	6,621	6,998	7,047	-0.1	0.7
EU	5,295	5,042	4,947	4,903	5,102	5,086	5,382	5,369	0.2	-0.2
Non-EU	1,758	1,354	1,352	1,432	1,385	1,535	1,616	1,678	-0.9	3.8
% EU	75.1	78.8	78.5	77.4	78.6	76.8	76.9	76.2		
% Non-EU	24.9	21.2	21.5	22.6	21.4	23.2	23.1	23.8		
Exports										
Total	4,011	3,998	4,406	5,241	5,176	6,136	6,103	6,493	4.8	6.4
EU	2,783	2,741	2,954	3,424	3,539	4,422	4,372	4,653	5.2	6.4
Non-EU	1,228	1,257	1,452	1,817	1,636	1,715	1,731	1,839	3.9	6.2
% EU	69.4	68.6	67.1	65.3	68.4	72.0	71.6	71.7		
% Non-EU	30.6	31.4	32.9	34.7	31.6	28.0	28.4	28.3		
Balance										
Total	-3,043	-2,398	-1,893	-1,094	-1,312	-485	-895	-554	-12.7	-38.1
EU	-2,513	-2,300	-1,993	-1,479	-1,563	-664	-1,010	-716	-9.6	-29.1
Non-EU	-530	-97	100	385	251	180	115	161	*	39.9

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

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

velopments is the considerable decrease of the agro-food trade deficit by a cumulative 82%, to €554 million, down from its highest level of €3.04 billion in 2008. It is worth noting that during the last few years the petroleum products trade deficit has varied between €3 and €4 billion. It is remarkable that before the crisis, the Greek economy, a traditionally agro-food oriented economy, had an agro-food trade deficit similar to the petroleum trade deficit. This is indicative of the problems of the structure of the trade balance as well as the structure of the whole economy and the productive model followed prior to the crisis.

The European Union (EU) is by far the most important trade partner of Greece. Around 76% of imports and 72% of Greek exports take place with the EU member-states. In 2018 there was a slight increase of imports from third countries (non-EU countries)

while exports increased to a similar degree to both EU and non-EU countries. As a result, the trade surplus Greece has with its non-EU trade partners increased by 40%, or €46 million, while the deficit from EU trade decreased by 29%, or €294 million. (Table 4.4.2).

4.4.4. Structure of agro-food products trade

After a year (2017) of significant increase in agro-food imports, by 5.7%, in 2018 imports rose by just 0.7%, reaching the pre-crisis (2008) import level. Table 4.4.3 presents the evolution of imports of the main categories of the agro-food products. In 2018 the categories of fish, fruits and vegetables, coffee-tea-spices, feeding stuff, and tobacco had the most important increases in import value. Dairy, beverages, oils and fats, sugars, and hides had a decrease in import value.

TABLE 4.4.3 Imports of agro-food products categories in million € (M €)

	2008		2010		2012		2014		2016		2017		2018	
	M €	%	M €	%	M €	%	M €	%	M €	%	M €	%	M €	%
<i>Meat products^a</i>	1,211	17.2	1,160	18.4	1,199	18.9	1,162	17.9	1,150	17.4	1,242	17.7	1,242	17.6
<i>Dairy</i>	808	11.5	770	12.2	772	12.2	842	13.0	749	11.3	856	12.2	829	11.8
<i>Fruits-Vegetables</i>	786	11.1	672	10.7	635	10.0	663	10.2	748	11.3	812	11.6	827	11.7
<i>Cereals</i>	681	9.7	541	8.6	560	8.8	532	8.2	615	9.3	673	9.6	682	9.7
<i>Fish</i>	428	6.1	384	6.1	373	5.9	378	5.8	432	6.5	489	7.0	521	7.4
<i>Feeding stuff</i>	406	5.8	371	5.9	345	5.4	403	6.2	423	6.4	407	5.8	462	6.6
<i>Coffee, tea, etc.</i>	365	5.2	376	6.0	411	6.5	442	6.8	547	8.3	425	6.1	453	6.4
<i>Various foodstuff</i>	344	4.9	356	5.7	333	5.3	367	5.7	354	5.3	347	5.0	358	5.1
<i>Tobacco</i>	335	4.7	310	4.9	234	3.7	236	3.6	323	4.9	305	4.4	347	4.9
<i>Beverages</i>	436	6.2	370	5.9	267	4.2	248	3.8	281	4.2	318	4.5	309	4.4
<i>Oils and fats</i>	290	4.1	232	3.7	286	4.5	274	4.2	244	3.7	291	4.2	256	3.6
<i>Oil seeds</i>	224	3.2	173	2.7	219	3.5	220	3.4	193	2.9	203	2.9	202	2.9
<i>Sugars</i>	225	3.2	220	3.5	295	4.7	227	3.5	231	3.5	251	3.6	196	2.8
<i>Wood</i>	262	3.7	148	2.3	128	2.0	118	1.8	135	2.0	127	1.8	140	2.0
<i>Raw materials</i>	130	1.8	111	1.8	111	1.8	121	1.9	132	2.0	142	2.0	140	2.0
<i>Hides-skins</i>	93	1.3	76	1.2	146	2.3	116	1.8	46	0.7	86	1.2	62	0.9
Total	7,054^b		6,299		6,335		6,488		6,621		6,998		7,047	

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.

ΠΙΝΑΚΑΣ 4.4.4 Exports of agro-food products categories in million € (M €)

	2008		2010		2012		2014		2016		2017		2018	
	M €	%	M €	%	M €	%	M €	%	M €	%	M €	%	M €	%
<i>Fruits-Vegetables</i>	1,346	33.6	1,485	33.7	1,771	33.8	1,826	35.3	1,966	32.0	1,969	32.3	2,086	32.1
<i>Oils and fats</i>	333	8.3	287	6.5	393	7.5	322	6.2	674	11.0	570	9.3	704	10.8
<i>Fish</i>	449	11.4	541	12.3	613	11.7	556	10.7	661	10.8	674	11.0	689	10.6
<i>Dairy</i>	275	6.9	301	6.8	372	7.1	483	9.3	593	9.7	634	10.4	672	10.3
<i>Tobacco</i>	416	10.4	374	8.5	428	8.2	386	7.5	524	8.5	484	7.9	489	7.5
<i>Cereals</i>	315	7.9	292	6.6	330	6.3	338	6.5	421	6.9	361	5.9	402	6.2
<i>Cotton</i>	236	5.9	391	8.9	442	8.4	310	6.0	316	5.1	355	5.8	342	5.3
<i>Various foodstuff</i>	124	3.1	161	3.7	191	3.6	221	4.3	253	4.1	282	4.6	307	4.7
<i>Beverages</i>	163	4.1	166	3.8	202	3.9	198	3.8	205	3.3	222	3.6	223	3.4
<i>Meat products^a</i>	76	1.9	67	1.5	78	1.5	84	1.6	95	1.5	109	1.8	125	1.9
<i>Sugars</i>	54	1.3	129	2.9	119	2.3	71	1.4	91	1.5	96	1.6	91	1.4
<i>Coffee, tea, etc.</i>	30	0.7	34	0.8	54	1.0	60	1.2	86	1.4	80	1.3	80	1.2
<i>Feeding stuff</i>	51	1.3	41	0.9	47	0.9	58	1.1	58	0.9	61	1.0	80	1.2
<i>Oil seeds</i>	76	1.9	64	1.5	78	1.5	86	1.7	81	1.3	75	1.2	76	1.2
<i>Hides-skins</i>	38	0.9	40	0.9	80	1.5	64	1.2	69	1.1	73	1.2	63	1.0
<i>Raw materials</i>	18	0.4	20	0.5	30	0.6	34	0.7	35	0.6	46	0.8	51	0.8
<i>Wood</i>	9	0.2	7	0.2	8	0.2	10	0.2	6	0.1	10	0.2	11	0.2
Total	4,011^b		4,406		5,415		5,176		6,136		6,103		6,493	

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.

Note that, in general, the per-unit prices, in most cases, decreased (dairy, sugars, coffee-tea, hides, and raw materials). Increases in per-unit prices were observed in tobacco, fish, cereals, and feeding stuff. Changes in per-unit prices can considerably affect the change in import and export value. For example, although the imported quantity of sugars increased by 3%, their import value declined by 22% due to a sharp fall in prices. On the contrary, the imported quantity of cereals decreased by 3%; however, their import value increased by 1% due to a slight increase in prices.

The structure of agro-food imports does not change overtime and this is expected unless there is a shift in the eating habits of Greeks. Meat and dairy products have, as usual, the largest share of agro-food imports, namely 30%, or €2 billion. This column always underlines the importance of developing the bovine and por-

cine sector not only for economic reasons (limiting the trade deficit), but also for social reasons. It is not wise for the population of a country to be so dependent on imports, especially for basic food items, such as milk and meat.

Table 4.4.4 presents the evolution of exports of the main agro-food product categories. Fruits and vegetables, as usual, capture the largest share (32.1%) of all agro-food exports. Moreover, in 2018, the export value of fruits and vegetables exceeded €2 billion for the first time. It was also a good year for oils (mostly olive oil), which reached more than €700 million following a year of very high olive oil production. This is not expected to continue in 2019, especially after the very low production of 2018. Fish (mostly aquaculture products) had a small increase in export value, but it is worth noting that the capacity of the sector, par-

ticularly after solving many of its financial problems, is promising for the future growth of fish exports. Dairy exports (mostly feta cheese and yogurt) continue to grow. However, the decline of the per-unit price of dairy offset part of the significant increase (15%) of exported quantities. The same happened for olive oil, the exported quantity of which increased by 46%, but the exported value increased by only 23% due to the decline of the per-unit price.

In general, most of the agro-food categories increased their export value in 2018. Only cotton, hides and sugars had a decrease in export value. The increase of cotton prices partly offset the decline of export value, while the decrease of the prices of hides and sugars more than offset the increase by 12.5% of the exported quantities. All the above resulted in the considerable increase of the share of olive oil exports, which now rank second behind fruits and vegetables.

4.4.5. Concluding remarks

Regarding export performance, 2018 was a good year. It was a surprisingly good year for total exports, the rate of growth of which far surpassed the rate of growth of

imports, resulting in a deficit decline— something rare for the Greek economy during periods of positive GDP change. It was a remarkably good year for the agro-food sector, the deficit of which fell by 38.1%.

Most economies that are characterized by a developed agricultural sector have a surplus in their agro-food trade balance. Greece has managed (thanks to the crisis?) to slash its agro-food deficit by an astonishing 82% since 2008, mainly by expanding its exports rather than limiting its imports. Olive oil had a major contribution in the reduction of the deficit in 2018. However, this year olive oil exports seem to be significantly reduced due to a very bad production year. In 2017 a decrease in olive oil exports resulted in a deficit increase. Unless all other agro-food sectors considerably increase their exports, we can expect an increase in the trade deficit in 2019. It is highly important for the olive oil industry to improve the processing of olive oil rather than directly selling it in bulk at a relatively low price. It is true that there have been some steps toward this direction, but there is a lot yet to be done if we want a) to significantly increase the export value of olive oil and b) minimize its year-to-year large variation due to the natural phenomenon of the annual production variation.

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Multidimensional analysis of the productivity of the Greek economy

Theodore Tsekeris*

Abstract

The enhancement of productivity constitutes a crucial component for the sustainable development of a country and is closely related to more and better jobs and improved living standards. Hence, there are strong requirements for monitoring and interpreting the trends and main determinants of productivity, in conjunction with the design and evaluation of policies for promoting productivity at the national, sectoral and regional levels. This article first examines the national and sectoral dimensions of productivity in Greece. Given the increased and persistent regional inequalities in the country, it further analyses labour productivity and total factor productivity as well as the interregional productivity gap over time. The level and evolution of labour productivity are also investigated by sector of economic activity in each region. The findings provide useful insights into the formulation of policies for boosting the sustainable and inclusive growth, productivity and competitiveness of the country through identifying needs and opportunities for reforms and investments.

JEL codes: D24, O47, R12.

Keywords: Labour productivity, multifactor productivity, sectoral and regional analysis, productivity gap.

1. Introduction

Productivity improvements have a persistent effect and greatly determine the living standards and the sustain-

able growth, efficiency and stability of the economy of a country in the long run. The strengthening of productivity constitutes a major priority for the Greek government in both its national strategic growth plan (Hellenic Republic, 2018) and the national reform programme (Hellenic Republic, 2019). In contrast with horizontal measures of economic policy, whose effectiveness are contested, emphasis is given to the implementation of (more) targeted measures at the levels of regions and sectors of economic activity, in order to boost employment and regional development.

Specifically, the issue of the analysis of labour productivity, typically expressed in terms of the ratio of GDP to total working hours, can be regarded as multidimensional since it is affected by several driving factors which are present and interplay at the global, European, national, sectoral and regional/local levels. Particularly, the treatment of the productivity slowdown and the increasing inequalities among firms, industries and regions are considered as policy priorities for the European Union (Rincon-Aznar et al., 2014; Juncker et al., 2015; Van Ark and Jäger, 2017). For these purposes, fiscal policies and structural reforms are suggested and implemented in specific sectors, such as education, research and development (R&D) and the labour market, especially in high value-added and technology-intensive activities, and in the influence of the digital transformation of the economy. In this context, the contribution of ICT (tangible and intangible) capital and skills to output growth becomes increasingly important. However, it is stressed that, in Greece, the contribution of the ICT capital and quality of labour to output growth are relatively limited, compared to the corresponding contribution of the non-ICT capital and quantity of labour (Tsekeris, 2018).

At the sectoral level by region, some changes in labour productivity can be associated with effects that are common in the EU, while others can be attributed to

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

endogenous characteristics of regional economies, including the level of regional specialisation and the sectoral concentration of economic activity. For instance, the processes of globalisation and the international fragmentation of labour and value-added production are considered as having intensified the sectoral concentration and the single (vs. multiple) specialisation of regions, or geographically dispersed specialisation patterns, in order for local (and more vulnerable) industries to retain their productivity levels and be protected from the exposure to globalised market competition. Compared with the concentration of new and higher-technology sectors in the core regions of Europe, traditional and lower-technology sectors tend to concentrate in the periphery. As a result, regions in the EU periphery are likely to increase their dependence on lower-technology sectors and reduce their competitiveness, with regard to the ability to innovate and produce higher value-added goods (IGEAT-ULB, 2008; Vegeulers, 2017).

Among others, the labour productivity of an industry can vary with the market structure, competition conditions, age and size of firms, adoption and use of ICT, and the ability to achieve economies of scope and scale in the same and other regions. On the one side, regions with more mature and technologically advanced economies, whose products pertain to higher complexity, have arguably improved performance in innovation, knowledge diffusion and productive efficiency, compared to regions with lower or medium technology and less mature economies (Siegel et al., 1995; Aiginger and Davies, 2004; Van der Panne, 2004; Frenken et al., 2007; Prager and Thisse, 2012). On the other side, regions encompassing more traditional markets, with lower technology and knowledge intensity, which are less exposed to (international) competition, can possibly have higher profit margins and productivity growth rates compared to regions with more extroverted and differentiated markets (Holmes and Stevens, 2002; Lee et al., 2010; Petrakos et al., 2012; Papaioannou et al., 2017).

This article investigates the variations in labour productivity among the regions and sectors of the Greek economy, the heterogeneity of labour productivity by sector in each regional economy, and the changes that occurred during the period of deep and persistent economic crisis in the country. Specifically, Section 2 examines developments in labour productivity in

Greece and differences between the national level of labour productivity and total factor productivity (TFP) and the corresponding international frontier. It is noted here that TFP, or multifactor productivity, is closely related to and often represents the efficiency of a national or regional economy. It denotes how efficiently physical capital and labour inputs (and, possibly, other inputs, like energy and land, given the availability and exploitability of data) are used in the production process. In other words, a change in TFP corresponds to that change of GDP which cannot be explained by changes in physical capital and labour (or other production) inputs. Section 3 provides an analysis of labour productivity and TFP by NUTS-II region,¹ giving emphasis on the gap between the core region (Attiki, where the capital city of Athens is located) and peripheral regions as well as the best-performing region in the EU-28. Section 4 analyses, in more detail, labour productivity by sector of economic activity in each region. Section 5 summarises and concludes, suggesting policies for strengthening productivity and reducing inequalities at the national, sectoral and regional levels.

2. National and sectoral dimensions of productivity

In this section, labour productivity is examined at both the national and the sectoral level, in order to identify possible structural problems in the Greek economy. According to the OECD, during the decade 2008-2017, labour productivity in the country decreased by -9.6%. This drop was smaller during the last 5-year period 2013-2017 (-1.4%), compared to that during the period 2008-2012 (-7.6%), namely, the first years of the economic crisis (Figure 1). To the contrary, during the same period (2008-2017), the average labour productivity in the EU-28 increased by 9%, while the increase in average labour productivity in the countries of the euro area and the OECD (about 8.4% in both cases) was slightly smaller. Nonetheless, there was a slowdown of labour productivity in all cases, particularly in the euro area (from 3.9% during 2008-2012 to 3.2% during 2013-2017).

Based on Papaioannou et al. (2017), the gap $P_{GAP,c,t}$ in labour productivity $P_{c,t}$ (expressed as the ratio of GDP to the total working hours) of a country c , with respect to the best-performing country f (with the maximum

1. This corresponds to the second-level classification of the Nomenclature of Territorial Units for Statistics (NUTS) for the sub-national division of EU regions.

labour productivity), in a sample of countries under examination, in time period (year) t , can be given as follows:

$$P_{\text{GAP},t} = \ln \left(\frac{P_{i,t}}{P_{c,t}} \right) \quad (1)$$

During 2008-2017, Greece notably increased (by 23%) its distance from the best-performing country in the euro area (and the OECD) (Figure 1). This increase was magnified during 2013-2017 (10.5%), compared to the period 2008-2012 (7.5%), suggesting a decline in the competitiveness of the country (as expressed by the distance from the production frontier²).

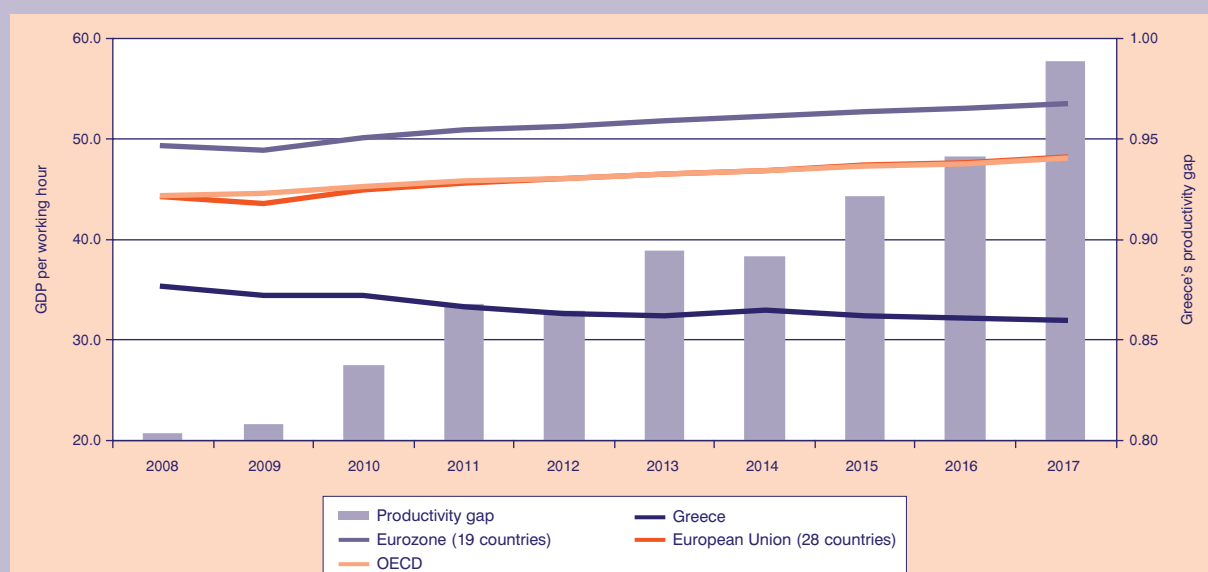
In addition to labour productivity, the TFP is also considered here, as it mirrors a range of productivity-

influencing factors, such as agglomeration economies, networking effects, knowledge diffusion and other externalities, technological progress and organisational changes. Assuming the existence of constant elasticity of substitution between labour and capital, and constant returns to scale, a Cobb Douglas production function can be specified of the following form:³

$$Y_{i,t} = A_{i,t} (K_{i,t})^\alpha (L_{i,t})^{(1-\alpha)}, \quad (2)$$

where $Y_{i,t}$ represents the gross output and $K_{i,t}$ and $L_{i,t}$ the physical capital stock⁴ and labour input (typically defined in terms of total working hours), respectively, in a country (or region) i in time period (year) t , while $A_{i,t}$ refers to a technological parameter that is neutral of capital and labour inputs, which here represents the

FIGURE 1
Labour productivity (GDP per working hour, in USD, constant prices, 2010 PPP¹) in Greece, the Euro area, the EU-28 and OECD countries, and the productivity gap in Greece,² 2008-2017



Source: Own processing of data from the OECD.

Notes: 1. Prices are adjusted for Purchasing Power Parity (PPP).

2. The best-performing country during 2008-2014 was Luxembourg, and during 2015-2017 was Ireland.

2. It corresponds to the reference country for benchmarking (i.e., whose labour productivity defines the frontier) among the OECD countries. This country may differ across the time period of the study.

3. See Papaioannou et al. (2017) for further information and explanation about the theoretical background and specification of the Cobb Douglas production function and its application to the Greek regional economy. It is noted that the Cobb Douglas production function can be alternatively specified by assuming different returns to scale and types of technical progress, and it constitutes the most widely adopted production function in the literature (Acemoglu, 2008).

4. The variable of physical capital stock is estimated with the use of the perpetual inventory method for each region and year of the study period (Derbyshire et al., 2013).

TFP (Papaioannou et al., 2017). The parameter α denotes the capital share of income. In turn, TFP can be calculated as follows:⁵

$$TFP_{i,t} = \frac{Y_{i,t}}{(K_{i,t})^\alpha (L_{i,t})^{(1-\alpha)}} \quad (3)$$

For the comparative analysis of TFP among countries and its intertemporal evolution in Greece, this measure is expressed as an index, in relation to the US=1 and in constant national prices over time (2010=1) (Figure 2). The TFP of the Greek economy presents a pronounced and increased deviation from the TFP of both the US and Germany, declining at about 54% of the TFP of those two countries in 2017. Especially, the TFP of the Greek economy (at constant national prices) was reduced by 17% during the period 2008-2012, and basically remained the same afterwards.

With regard to the sectoral dimension of labour productivity in Greece, during the period 2008-2016, all sectors of economic activity presented a decline in productivity, except for manufacturing (23%), con-

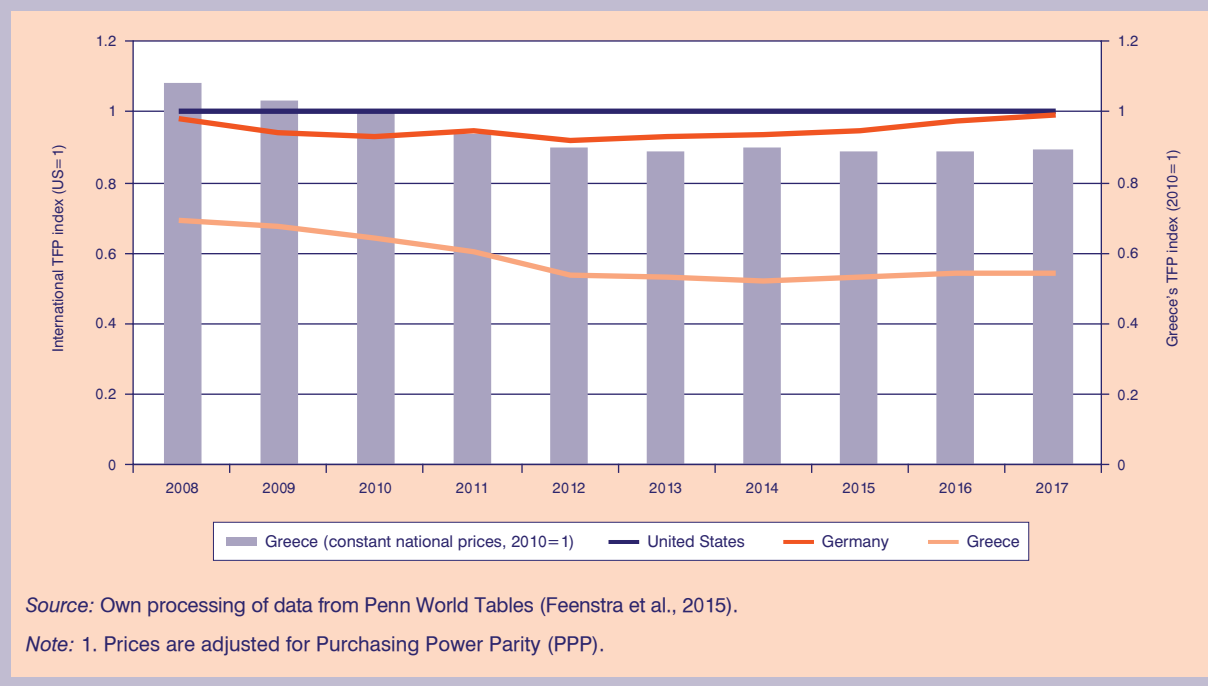
struction (20%), and agriculture-forestry-fishing (14%) (Figure 3). The growth in labour productivity in the sectors of agriculture-forestry-fishing and construction refers to the first 5-year period 2008-2012. Particularly in the case of construction, this growth is attributed to the remarkably higher rate of employment reduction (in total working hours), compared to the falling rate of gross value-added production. On the contrary, the manufacturing sector increased its labour productivity mostly during the period 2013-2016 (by 14%).

Nevertheless, it is mentioned that the sectors of real estate, renting and business service activities, and financial and insurance activities, together with that of electricity, gas, water supply, sewerage, waste management and remediation activities, retained the best performance in labour productivity, although it decreased over the whole period. Agriculture-forestry-fishing remained the sector with the lowest labour productivity in the Greek economy.

These results suggest the need for the further modernisation and upgrading of sectors producing inter-

FIGURE 2

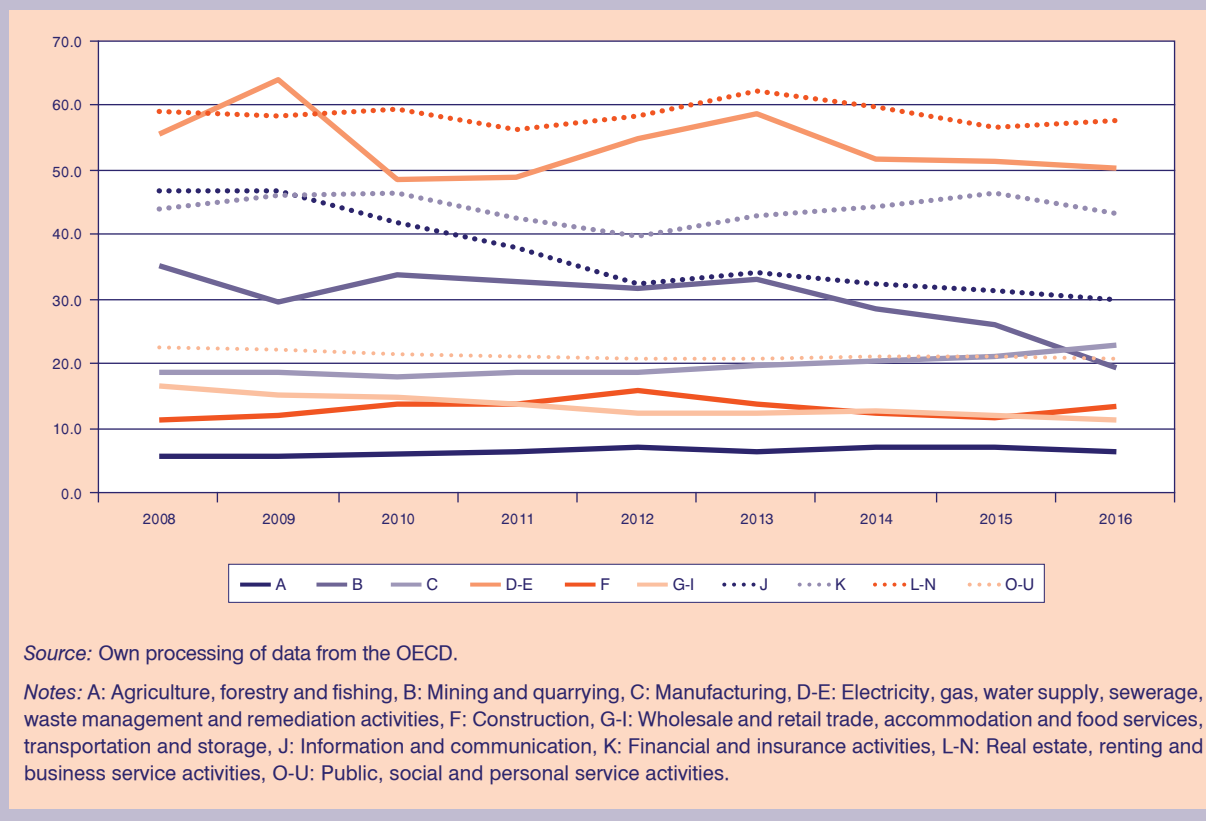
TFP index for Greece and Germany, constant prices, PPP¹ in relation to US=1, with respect to the prices of the reference period, and TFP index for Greece, constant national prices (2010=1), 2008-2017



5. However, the part of output growth which cannot be explained by changes in production inputs may be differentiated according to the way the dependent variable of the production function is defined (Bell and Ho, 1977).

FIGURE 3

Labour productivity (gross value added per working hour, in euro, constant prices 2010) by sector of economic activity in Greece, 2008-2017



nationally tradable goods, such as those of manufacturing and agriculture, whose labour productivity still remains at low levels, in relation to sectors of services, in order to promote the transformation of the production model of the country and its competitiveness.

3. The regional dimension of productivity

According to the OECD (2018), most regions of its member-countries have increased their productivity, but larger inequalities appear within them, so as their growth becomes less inclusive. However, the tradeoff between regional productivity growth and increased regional inequalities cannot be regarded as the general rule. In the case of Greece, the intense and persistent problem of core-periphery inequalities (Tsekeris, 2017) renders necessary the measurement of regional labour productivity and TFP and the corresponding productivity gap among regions. As described in Papaioannou et al. (2017), the measurement of regional productivity can help

determine the considerable heterogeneity among regions and identify suitable policies for reducing spatial disparities and supporting regional convergence.

Initially, the labour productivity $P_{r,t}$ (expressed as the ratio of gross value added to total working hours) in each region r in some time period (year) t is calculated (Figure 4). The corresponding productivity gap $P_{GAP,r,t}$ between Attiki (i.e., the region with the highest labour productivity) and the remaining regions of the country is given as:

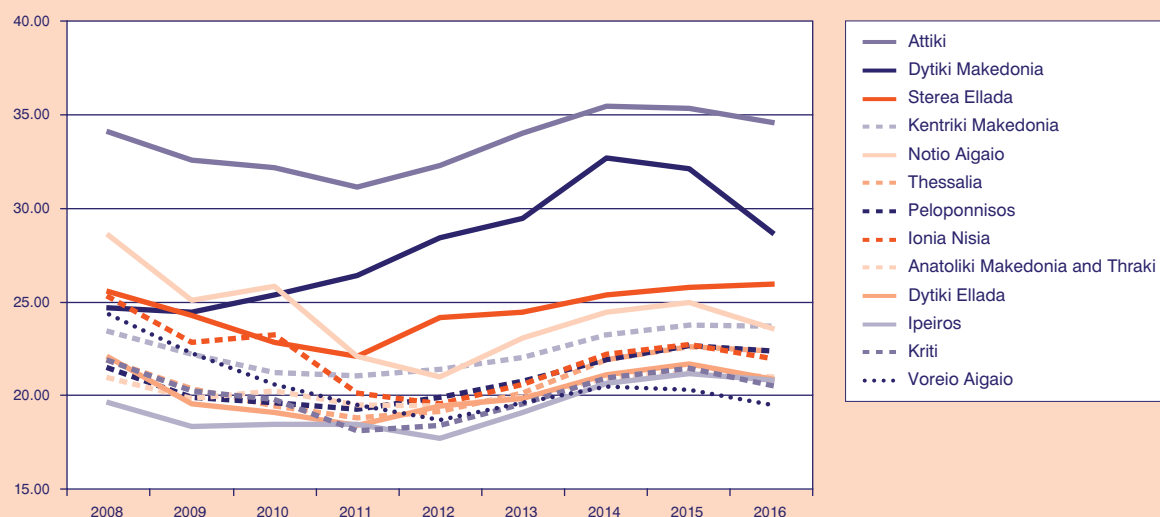
$$P_{GAP,r,t} = \ln \left(\frac{P_{Attiki,t}}{P_{r,t}} \right), \quad (4)$$

where $P_{Attiki,t}$ refers to the labour productivity of the region of Attiki. The productivity gap between Attiki and the EU region with the highest labour productivity in each year of the study period is calculated correspondingly (Figure 5).

During the period 2008-2016, Dytiki Makedonia and Sterea Ellada were the regions with the highest la-

FIGURE 4

Labour productivity (gross value added per working hour, in euro, 2010 constant prices) in the Greek regions, 2008-2016

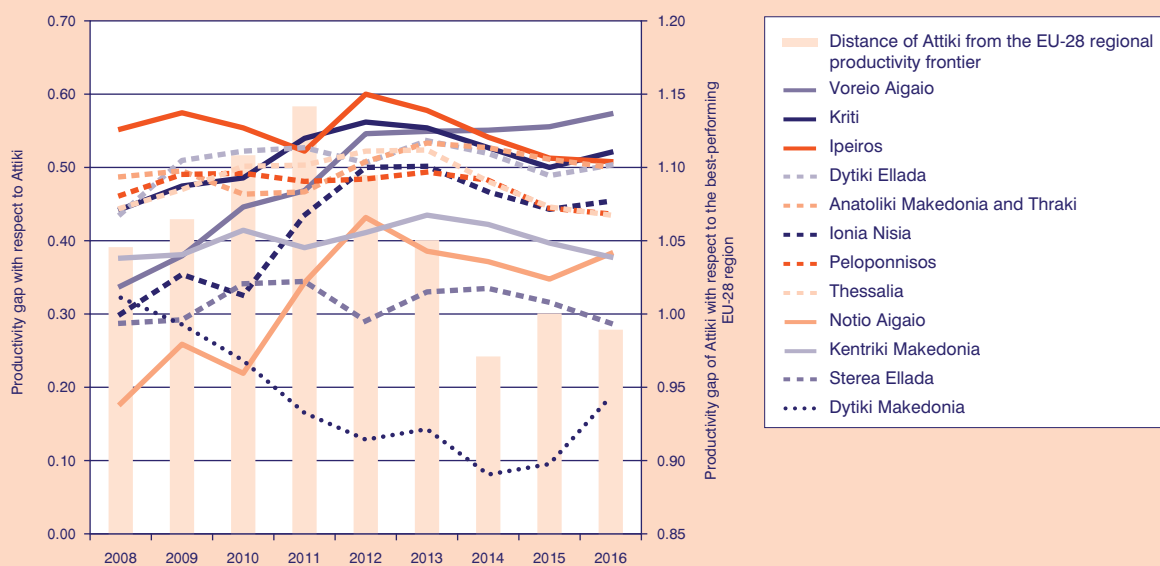


Source: Own processing of data from Eurostat.

Note: Regions are listed in descending order according to the level of labour productivity in 2016.

FIGURE 5

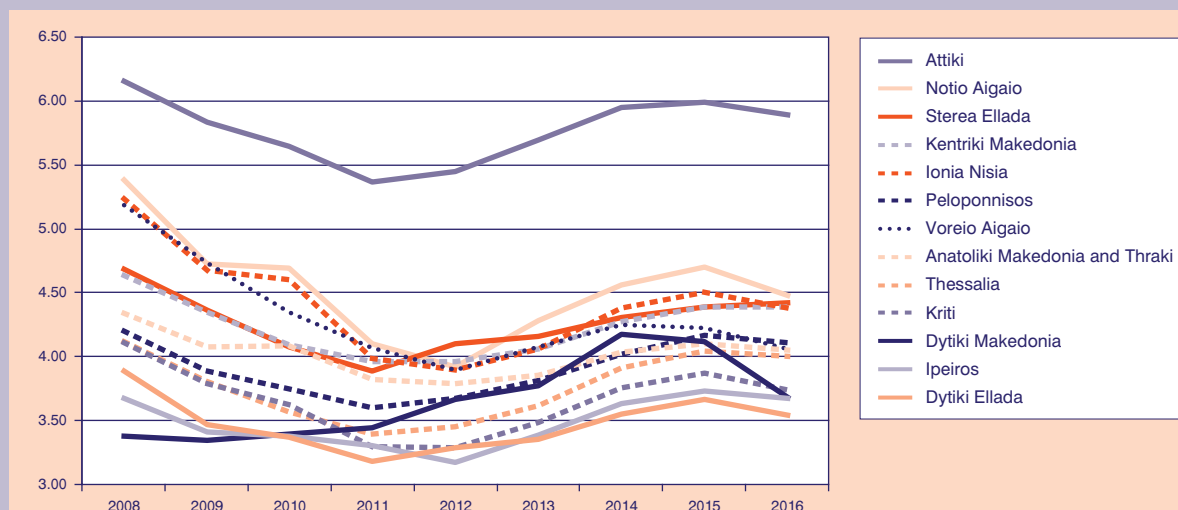
Productivity gap between Attiki and the remaining regions of Greece, and between Attiki and the best-performing EU-28 region,¹ 2008-2016



Source: Own processing of data from Eurostat.

Notes: 1. The EU region with the highest labour productivity during 2008-2016 was that of Brussels. Regions are listed in descending order according to the magnitude of their productivity gap from the region of Attiki in 2016.

FIGURE 6
TFP of Greek regions, 2008-2016



Source: Tsekeris and Papaioannou (2019).

Note: Regions are listed in descending order according to the level of TFP in 2016.

bour productivity, following Attiki.⁶ To the contrary, during 2008-2013, Ipeiros was the region with the lowest labour productivity (except for 2011, when Kriti presented the lowest labour productivity), while during 2014-2016, the region with the lowest labour productivity was Voreio Aigaio. In the given study period, the productivity gap between Attiki and the other regions increased on average. Also, during 2008-2011, the productivity gap between Attiki and the EU region with the highest labour productivity (i.e., Brussels) also increased, but it then gradually diminished, reaching in 2016 a level lower than that before 2013 (Figure 5).

Next, Figure 6 presents the TFP in each Greek region and Figure 7 depicts the TFP gap between Attiki and the remaining regions of the country, as well as between Attiki and the EU region with the highest TFP. Assuming the existence of constant elasticity of substitution between capital and labour, and constant returns to scale, the regional TFP can be calculated with the use of equation (3), setting $\alpha=0.333$. This strong assumption about the share of capital (and labour) in income is made due to the absence of relevant data at the regional level. However, it is

adopted in the literature of regional economic analysis (e.g., Marrocu et al., 2013; Beugelsdijk et al., 2018). It has also been proven empirically that the sum of capital and labour shares are close to unity, at both the cases of Greek and EU regions (Tsekeris and Papaioannou, 2018; Tsekeris and Papaioannou, 2019, respectively).

Similar to equation (1), the gap $TFP_{GAP,r,t}$ of the $TFP_{r,t}$ in a region r , in some time period (year) t , can be given as follows:

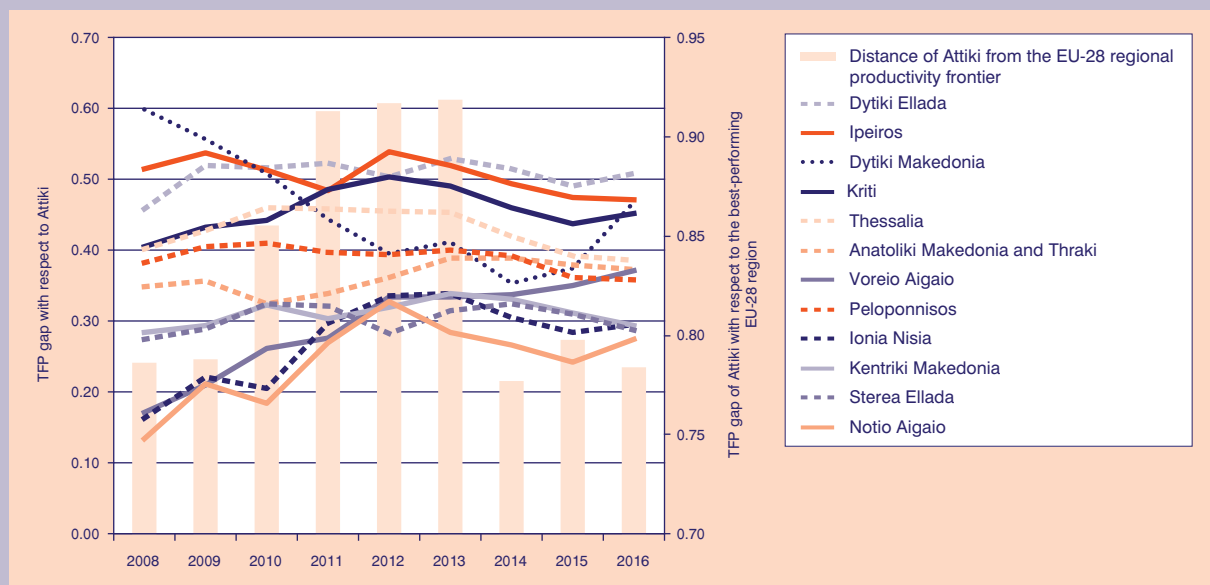
$$TFP_{GAP,r,t} = \ln \left(\frac{TFP_{Attiki,t}}{TFP_{r,t}} \right), \quad (5)$$

where $TFP_{Attiki,t}$ refers to the TFP of the region of Attiki, which is the region with the highest TFP in the country (Figure 6). It is, however, noted that the ranking of the remaining regions according to the magnitude of TFP differs from that based on the magnitude of labour productivity. Particularly, it is mentioned that, while Dytiki Makedonia is ranked second on the basis of labour productivity, it drops to the 11th position on the basis of TFP. This notable difference can be attributed, among other factors influencing the for-

6. The names of regions follow the Eurostat's NUTS. These names are translated to English as follows: Attica (Attiki), Central Greece (Sterea Ellada), Central Macedonia (Kentriki Makedonia), Crete (Kriti), Eastern Macedonia and Thrace (Anatoliki Makedonia-Thraki), Epirus (Ipeiros), Ionian Islands (Ionia Nisia), North Aegean (Voreio Aigaio), Peloponnese (Peloponnisos), South Aegean (Notio Aigaio), Thessaly (Thessalia), Western Greece (Dytiki Ellada), Western Macedonia (Dytiki Makedonia).

FIGURE 7

TFP gap between Attiki and the remaining regions of Greece, and between Attiki and the EU-28 region with the best TFP,¹ 2008-2016



Source: Tsekeris and Papaioannou (2019).

Note: 1. The EU region with the highest TFP was that of Brussels during 2009-2011 and 2014-2016, and Groningen in 2008, 2012 and 2013. Regions are listed in descending order according to the magnitude of their TFP gap from the region of Attiki in 2016.

mation of its regional product, to the operation of the electric power generation units of the Public Power Corporation in the constituent prefectures of Kozani and Florina (Tsekeris, 2017). In 2016, the region of Notio Aigaio presented the second highest TFP in the country, although it ranked fifth on the basis of labour productivity. It is further noted that, in 2016, the region of Voreio Aigaio presented the 7th highest TFP in the country, although it was in the last position on the basis of labour productivity.

Similar to labour productivity, during 2008-2012, TFP decreased considerably in all the regions (except for Dytiki Makedonia) and recovered after 2013. Nonetheless, in contrast with labour productivity, whose performance is mixed among regions over time, the TFP of all the regions (except for Dytiki Makedonia) decreased in total during the given study period. The region of Notio Aigaio presents the second highest TFP in all the years of the reference period (except for 2012, when the region of Sterea Ellada had the second highest TFP in the country).

On the contrary, during 2008-2009, Dytiki Makedonia had the lowest TFP, while during 2010-2016, Dytiki Ellada had the lowest TFP (except for 2012, when the region of Ipeiros had the lowest TFP). Similar to the case of the labour productivity gap, during the given

study period, on average, the TFP gap between the region of Attiki and the other regions of the country increased.

Map 1 depicts the intense and persistent interregional differences in TFP. The dominance of the region of Attiki is evident and steady over time, against the other regions of the country. Some regions have improved their relative position, in terms of their ranking on the basis of TFP, as they either presented smaller losses (Kentriki Makedonia, Sterea Ellada, Peloponnisos) or increased their TFP (Dytiki Makedonia), in contrast with other regions that presented larger losses (Dytiki Ellada, Voreio Aigaio).

The considerable disparities between the core (Attiki) and peripheral regions, in terms of both labour productivity and TFP, can be attributed to a range of factors, including the complex geomorphological terrain of the country (with the large mountainous blocks and the scattered island complexes, which hinder the accessibility and the ease of service provision), the small size of firms, the difficulty of doing business and creating new and high value-added employment positions, and the limitations to developing or exploiting economies of scope and scale (Papaioannou et al., 2017; OECD, 2019). As shown in Figure 7, the TFP gap between the region of Attiki

MAP 1

TFP in the 13 NUTS-II regions of Greece, (a) in 2008, and (b) in 2016

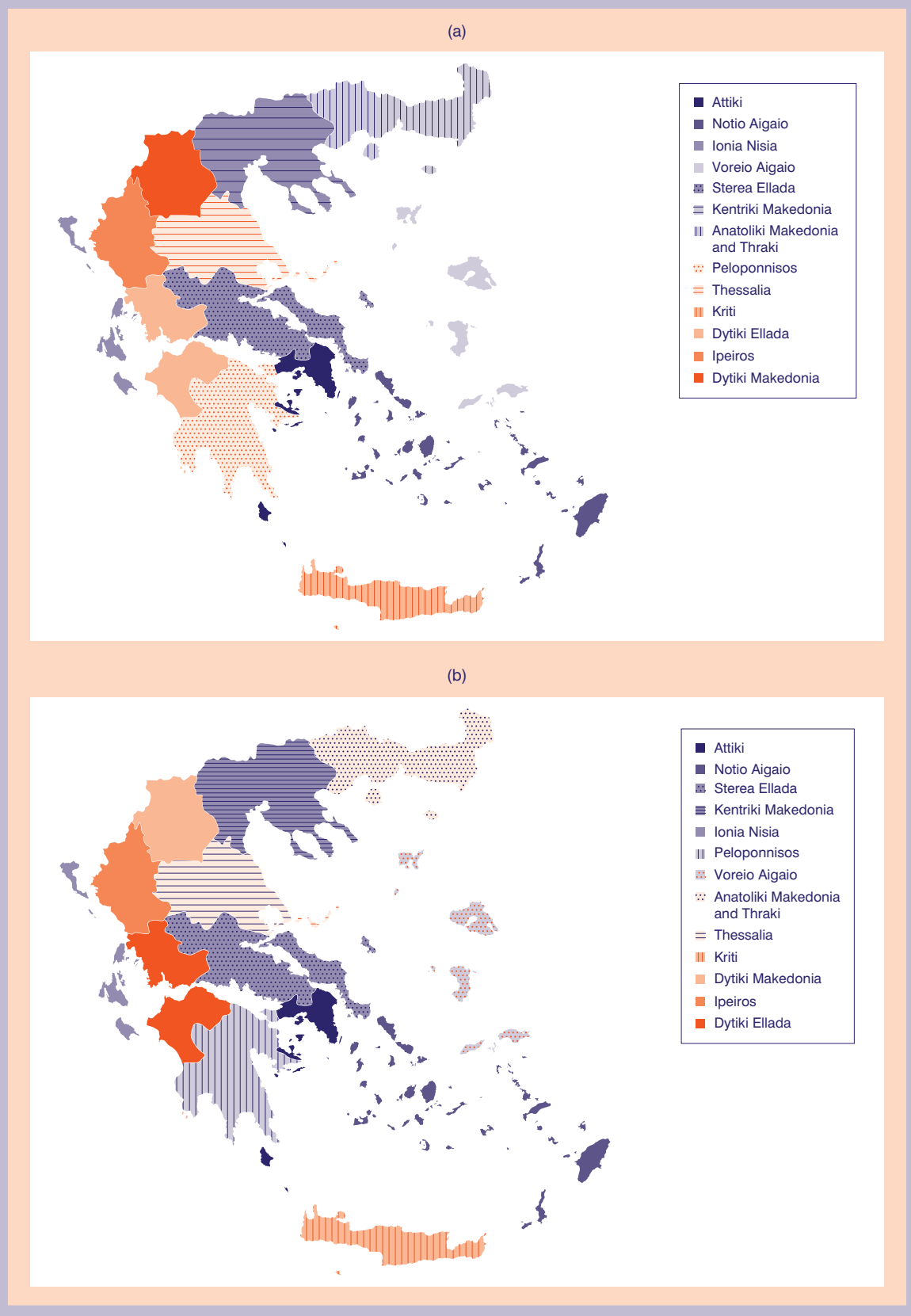
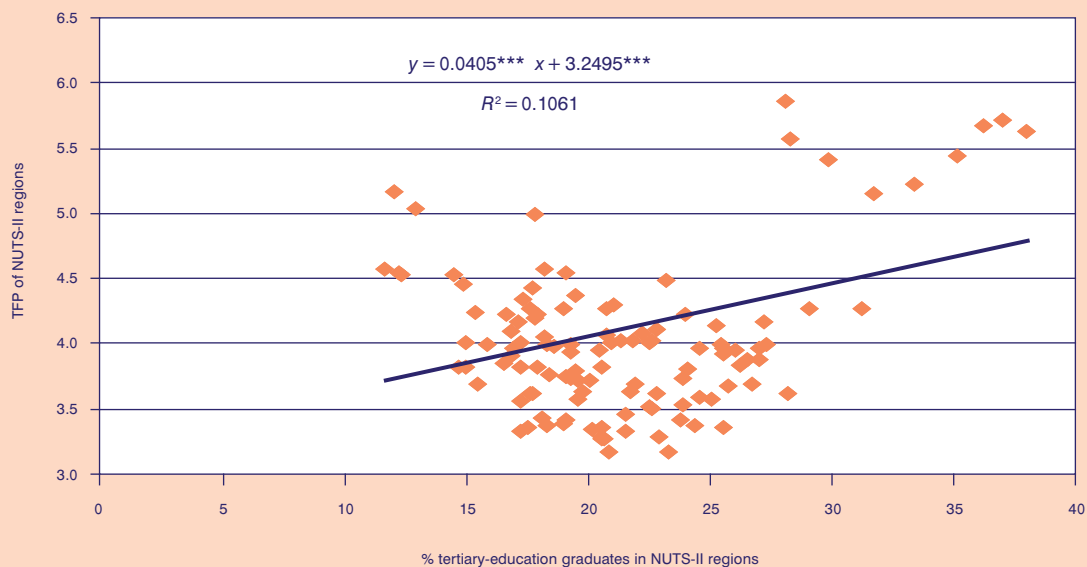


FIGURE 8

Relationship between TFP and human capital (% tertiary education graduates) at the regional level in Greece, 2008-2016

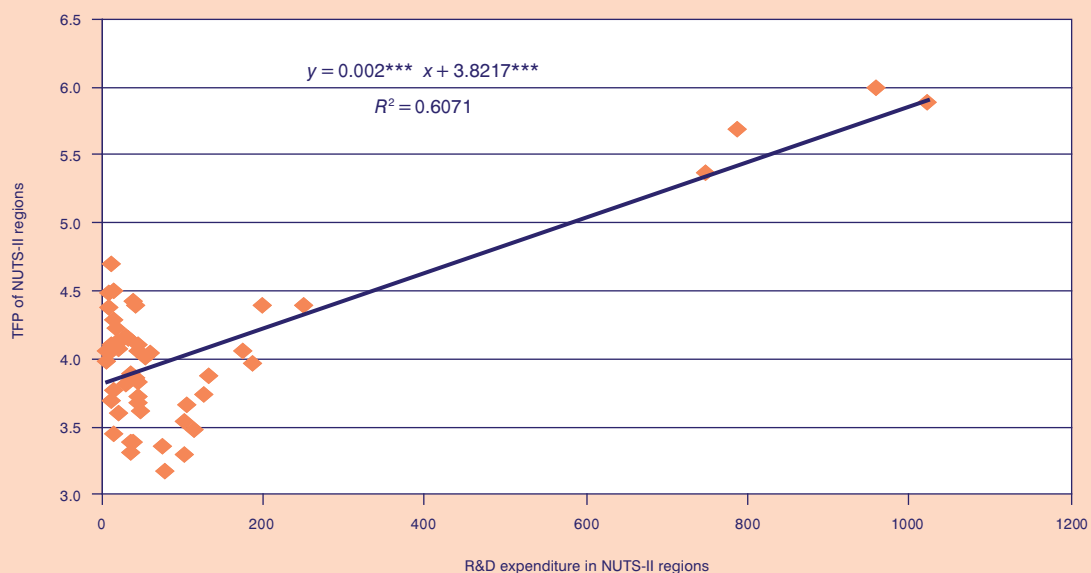


Source: Tsekeris and Papaioannou (2019) and own processing of data from Eurostat.

Note: *** Denotes statistical significance above 99% level of confidence.

FIGURE 9

Relationship between TFP and R&D expenditure (in euro, 2010 constant prices) at the regional level in Greece, 2011-2016



Source: Tsekeris and Papaioannou (2019) and own processing of data from the National Documentation Centre (EKT).

Notes: There are no data for years 2012 and 2014.

*** Denotes statistical significance above 99% level of confidence.

and the best-performing EU region increased considerably during 2010-2013, and then recovered in 2014, reaching the level of 2008.

Provided the importance of the human capital and R&D expenditure on the ability of regions to innovate and increase their productivity, by utilising their capital and labour inputs in a more efficient way, the relationship between those variables and regional TFP is examined here. The human capital is expressed as the ratio of the working population who are tertiary education graduates in each region (Papaioannou et al., 2017). The R&D expenditure corresponds to both the public and the private sector.

The findings indicate that there is a statistically significant ($p < 0.01$) positive correlation between human capital and TFP at the NUTS-II level of regions. The regions with the highest and fourth highest TFP, namely, Attiki and Kentriki Makedonia, respectively, concentrate the highest human capital stock in the country (Figure 8 above). Additionally, the regions of Attiki and, to a much lesser extent, Kentriki Makedonia, have the most expenditure on R&D. The correlation between R&D expenditure and TFP at the NUTS-II level of regions is also found to be statistically significant ($p < 0.01$) and positive (Figure 9 above).

4. Labour productivity by region and sector

Given the considerable variations in productivity among regions and sectors of economic activity, as described in the previous sections, labour productivity is analysed here by sector in each region of the country. It is stressed that the development process of a region is significantly affected by the typology of firms located in that region and the sectoral composition of local production (McCann, 2013). For this purpose, on the basis of data originating from the business registry of ELSTAT, in years 2008 and 2016, the labour productivity of each sector in a region is calculated as the ratio of the turnover of all firms belonging to that sector to the total number of employees.

The labour productivity patterns observed by sector in each region are partially different, compared to those relying on the analysis only at the sectoral or regional level. Nonetheless, it should be taken into account that the variable of labour productivity is calculated here by adopting a different definition, i.e., the firm turnover per employee, at a more detailed level of sectoral

analysis. In 2008, financial and insurance activities, and electricity, gas, steam and air conditioning supply in the region of Attiki are the sectors with the highest labour productivity (Table 1). In 2016, the sectors with the highest labour productivity are those of electricity, gas, steam and air conditioning supply in the region of Attiki, and real estate activities in the region of Sterea Ellada (Table 2).

In both 2008 and 2016, the sector of wholesale and retail trade and repair of motor vehicles and motorcycles, presents, on average, the highest labour productivity. Other sectors of high labour productivity are, on average, those of manufacturing, mining and quarrying, financial and insurance activities (in 2008) and electricity, gas, steam and air conditioning supply (in 2016). In both years, the sectors with the lowest labour productivity (excluding the unknown activities) are, on average, those of public administration, defence and compulsory social security, and education.

The regions of Attiki and Kentriki Makedonia present, on average, the highest labour productivity. It is noted that the increase of labour productivity in the region of Sterea Ellada in 2016 is mainly attributed to the remarkable growth of labour productivity in real estate activities, which is a sector with very high capital intensity (large transaction values due to the real estate prices) and a small number of employees. A notable increase in labour productivity between the years 2008 and 2016 is also observed in the sector of electricity, gas, steam and air conditioning supply, particularly in Kriti, Anatoliki Makedonia and Thraki, Notio Aigaio, and other regions (Table 3). On the contrary, an important decrease in labour productivity is observed in the primary production sector (agriculture, forestry and fishing) in almost all the regions of the country, and in all the services sectors, particularly in public administration, defence and compulsory social security, and education, in almost all the regions of the country.

Next, the relationship between the average firm size and labour productivity by sector and region is examined. Based on the definitions of Eurostat,⁷ the average size of a firm can be defined in terms of (a) the average number of employees (number of workers per firm), and (b) the average turnover (turnover per firm). In contrast with the average number of employees (Figure 10), the average firm turnover by sector in each NUTS-II region presents a statistically sig-

7. <https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Statistics_on_small_and_medium-sized_enterprises#SME_definition>.

TABLE 1 Labour productivity (firm turnover per employee, in thousand euro, 2010 constant prices) by sector and region in Greece, 2008

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	W
Anatoliki																				
Makedonia and Thraki	48.9	92.4	113.5	7.3	65.3	51.0	118.2	71.1	25.1	27.4	17.4	27.2	25.2	24.4	15.7	20.8	17.4	19.2	13.2	16.3
Kentriki																				
Makedonia	44.7	164.8	94.9	88.9	107.9	63.1	140.0	86.3	31.2	71.1	341.8	31.3	35.3	51.1	17.1	16.6	26.1	35.0	18.4	19.0
Dytiki																				
Makedonia	26.8	178.1	63.1	28.7	72.2	63.5	108.9	70.7	21.4	57.3	23.5	60.7	29.9	45.7	9.4	16.2	36.1	14.5	15.1	8.5
Ipeiros	62.4	40.9	87.5	12.1	59.7	40.5	119.0	70.9	24.2	33.1	16.4	26.6	25.0	21.1	8.4	14.7	10.9	14.1	63.1	9.9
Thessalia	70.6	107.3	113.5	128.9	86.5	57.5	128.8	83.2	29.0	36.3	45.3	43.6	27.2	32.4	12.1	15.0	27.8	20.0	13.0	13.8
Stereia Ellada	107.1	90.2	118.5	30.9	93.9	45.7	136.6	81.0	31.0	42.2	76.6	33.4	31.9	34.8	7.6	18.5	15.5	19.6	18.5	16.1
Ionian Nisia	49.9	52.3	56.3	11.9	50.2	38.1	126.6	83.0	28.9	27.0	34.3	35.3	27.6	37.6	11.5	15.7	11.5	17.4	18.0	10.1
Dytiki Ellada	57.7	37.3	88.9	6.4	68.9	44.4	132.8	86.1	28.0	32.1	64.1	42.3	31.1	22.1	10.2	9.9	16.2	19.4	18.9	11.9
Peloponnisos	68.3	103.5	120.4	10.3	86.4	35.6	135.7	74.2	30.7	23.0	16.7	23.5	27.4	28.5	4.6	20.1	18.6	99.1	19.0	15.1
Attiki	159.0	191.3	245.9	496.4	131.9	110.0	232.1	109.3	44.6	170.1	521.3	111.5	69.4	74.9	29.8	24.2	61.5	261.1	25.7	16.0
Voreio Aigaio	48.2	101.3	78.6	13.7	58.9	35.8	114.7	71.7	28.3	24.9	24.6	31.9	28.1	42.8	4.7	18.8	18.1	12.1	20.2	12.3
Notio Aigaio	84.3	131.8	66.1	11.2	41.7	54.6	145.5	65.9	36.5	41.7	25.5	51.2	31.9	57.2	18.4	22.6	20.8	41.4	21.4	30.1
Kriti	31.9	150.4	92.1	5.6	75.5	63.7	140.7	123.5	34.2	71.3	15.4	23.3	28.4	55.0	6.5	15.5	47.8	24.1	19.0	14.7

Source: Own processing of data from Business Registry, ELSTAT.

Notes: A: Agriculture, forestry and fishing, B: Mining and quarrying, C: Manufacturing, D: Electricity, gas, steam and air conditioning supply, E: Water supply, sewerage, waste management and remediation activities, F: Construction, G: Wholesale and retail trade; repair of motor vehicles and motorcycles, H: Transportation and storage, I: Accommodation and food service activities, J: Information and communication, K: Financial and insurance activities, L: Real estate activities, M: Professional, scientific and technical activities, N: Administrative and support service activities, O: Public administration and defence; compulsory social security, P: Education, Q: Human health and social work activities, R: Arts, entertainment and recreation, S: Other service activities, W: Unknown activities.

TABLE 2 Labour productivity (firm turnover per employee, in thousand euro, 2010 constant prices) by sector and region in Greece, 2016

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	W
Anatoliki Makedonia and Thraci	12.9	102.2	95.8	46.9	54.7	25.5	100.1	43.9	13.4	49.9	19.0	30.3	14.4	22.2	0.8	3.3	12.8	12.3	8.2	4.0
Kentriki Makedonia	14.5	134.3	96.4	84.9	89.4	44.5	119.8	55.6	17.4	44.9	46.9	31.0	21.1	39.7	3.6	4.1	16.3	14.9	9.8	9.7
Dytiki Makedonia	12.0	96.7	56.9	41.8	131.8	36.1	82.9	44.0	11.1	21.6	20.2	12.9	12.4	21.2	0.8	3.4	10.4	10.2	9.9	7.8
Ipeiros	21.1	38.2	134.4	45.0	52.5	20.4	103.8	45.8	12.7	21.8	35.3	20.4	14.0	20.3	1.6	3.0	7.3	9.8	8.9	0.6
Thessalia	15.3	85.1	122.5	91.9	69.0	51.2	100.9	45.6	14.7	24.1	26.3	21.5	16.2	23.6	0.8	4.4	17.0	13.2	14.1	0.5
Stereia Ellada	18.1	67.0	108.7	45.6	83.9	37.2	101.5	48.3	13.7	36.8	17.9	442.5	16.1	24.6	6.2	3.0	13.2	14.8	11.1	1.9
Ionian Nisia	6.5	72.6	43.7	28.4	50.3	22.2	99.3	51.5	22.0	36.3	14.5	41.9	16.8	40.3	1.2	3.7	11.1	16.8	11.7	11.3
Dytiki Ellada	12.3	84.4	103.3	47.3	60.1	30.3	101.7	45.0	13.3	26.7	15.7	32.8	17.0	16.4	2.0	3.8	12.6	18.3	8.9	0.9
Peloponnisos	9.9	115.1	115.2	46.8	70.9	24.0	109.6	45.2	15.6	28.0	16.3	23.1	15.5	24.5	1.5	3.8	11.0	27.6	10.9	2.5
Attiki	28.9	121.1	228.4	778.1	129.3	121.7	187.8	90.6	21.9	134.5	166.9	107.1	42.6	43.5	4.9	7.8	20.3	133.3	13.4	8.0
Voreio Aigaio	7.2	59.4	75.2	45.8	82.9	16.4	96.8	31.9	16.5	52.5	16.0	44.8	13.5	25.9	2.6	3.0	9.4	12.4	10.2	0.8
Notio Aigaio	9.8	83.9	51.6	63.7	55.5	28.5	107.9	40.2	29.3	57.9	18.6	49.1	18.0	44.0	1.8	4.9	16.5	22.8	12.9	3.6
Kriti	7.1	110.5	95.6	60.6	74.8	36.7	120.3	76.1	28.1	100.3	17.5	47.2	20.3	84.8	1.6	3.7	16.8	15.8	15.6	8.7

Source: Own processing of data from Business Registry, ELSTAT.

Notes: A: Agriculture, forestry and fishing, B: Mining and quarrying, C: Manufacturing, D: Electricity, gas, steam and air conditioning supply, E: Water supply, sewerage, waste management and remediation activities, F: Construction, G: Wholesale and retail trade; repair of motor vehicles and motorcycles, H: Transportation and storage, I: Accommodation and food service activities, J: Information and communication, K: Financial and insurance activities, L: Real estate activities, M: Professional, scientific and technical activities, N: Administrative and support service activities, O: Public administration and defence; compulsory social security, P: Education, Q: Human health and social work activities, R: Arts, entertainment and recreation, S: Other service activities, W: Unknown activities.

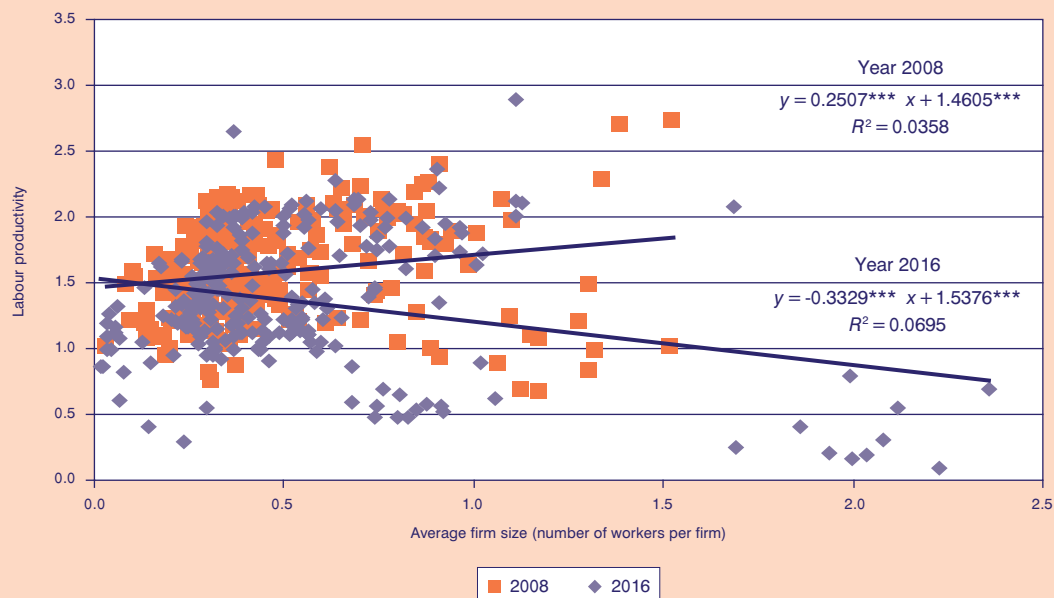
TABLE 3 Change (%) of labour productivity by sector and region in Greece during the period 2008-2016

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	W
Anatoliki																				
Makedonia and																				
Thraci	-73.5	10.6	-15.6	547.0	-16.3	-50.0	-15.3	-38.3	-46.6	82.2	9.4	11.4	-42.7	-8.9	-95.1	-84.3	-26.2	-36.0	-38.4	-75.6
Kentriki																				
Makedonia	-67.6	-18.5	1.5	-4.5	-17.2	-29.6	-14.4	-35.5	-44.4	-36.9	-86.3	-1.0	-40.3	-22.3	-79.1	-75.2	-37.6	-57.4	-46.7	-48.9
Dytiki																				
Makedonia	-55.3	-45.7	-9.8	45.5	82.6	-43.2	-23.9	-37.7	-48.3	-62.2	-14.0	-78.7	-58.5	-53.7	-92.0	-79.0	-71.2	-29.9	-34.6	-7.3
Ipeiros	-66.2	-6.5	53.6	271.4	-12.0	-49.6	-12.7	-35.4	-47.8	-34.3	115.0	-23.4	-43.9	-3.7	-81.5	-79.5	-33.4	-31.0	-85.9	-94.3
Thessalia	-78.4	-20.7	7.9	-28.7	-20.2	-11.0	-21.6	-45.1	-49.3	-33.6	-41.9	-50.7	-40.5	-27.1	-93.7	-70.4	-38.9	-33.7	8.2	-96.6
Stereia Ellada	-83.1	-25.8	-8.3	47.7	-10.6	-18.5	-25.7	-40.4	-55.7	-12.9	-76.6	1225.2	-49.4	-29.3	-17.5	-83.8	-14.4	-24.6	-39.8	-87.9
Ionian Nisia	-87.0	38.8	-22.3	138.1	0.2	-41.7	-21.6	-38.0	-23.8	34.6	-57.7	18.4	-39.2	7.2	-89.3	-76.7	-3.0	-3.2	-35.3	11.5
Dytiki Ellada	-78.6	126.0	16.2	637.7	-12.8	-31.8	-23.4	-47.8	-52.4	-16.8	-75.6	-22.5	-45.3	-25.7	-80.7	-61.7	-22.1	-6.0	-52.9	-92.8
Peloponnisos	-85.5	11.2	-4.3	353.9	-17.9	-32.7	-19.2	-39.1	-49.3	21.8	-2.4	-1.5	-43.4	-14.0	-68.1	-80.9	-40.9	-72.1	-42.8	-83.4
Attiki	-81.8	-36.7	-7.1	56.8	-1.9	10.6	-19.1	-17.2	-50.8	-20.9	-68.0	-4.0	-38.6	-42.0	-83.7	-67.8	-66.9	-48.9	-47.8	-49.9
Voreio Aigaio	-85.1	-41.4	-4.4	234.5	40.8	-54.2	-15.6	-55.5	-41.7	110.4	-35.0	40.3	-52.0	-39.5	-46.2	-84.1	-48.1	2.0	-49.3	-93.2
Notio Aigaio	-88.4	-36.3	-21.9	468.1	33.2	-47.9	-25.8	-39.0	-19.6	38.8	-27.0	-4.1	-43.6	-23.1	-90.3	-78.3	-20.3	-44.8	-39.5	-88.2
Kriti	-77.6	-26.6	3.7	977.2	-0.9	-42.3	-14.5	-38.4	-18.0	40.7	13.5	102.4	-28.3	54.3	-75.6	-76.1	-64.9	-34.6	-17.9	-40.5

Source: Processing of data from Tables 1 and 2.

FIGURE 10

Relationship between labour productivity and the average number of workers by sector and region in Greece, 2008 and 2016

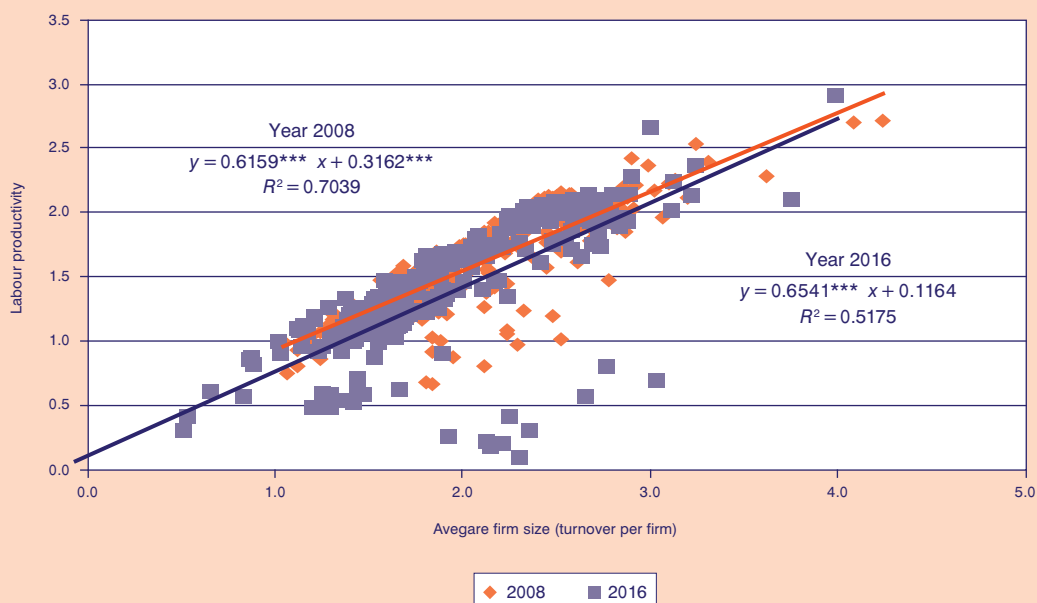


Source: Own processing of data from Business Registry, ELSTAT.

Note: *** Denotes statistical significance above 99% level of confidence.

FIGURE 11

Relationship between labour productivity and average firm turnover by sector and region in Greece, 2008 and 2016



Source: Own processing of data from Business Registry, ELSTAT.

Note: *** Denotes statistical significance above 99% level of confidence.

nificant and high correlation with labour productivity (Figure 11 above). However, the value of the coefficient of determination declined from 70% in 2008 to 52% in 2016, possibly indicating a reduced ability or a different strategy of local firms to exploit economies of scale in order to become more productive. These findings are consistent with those of previous studies in the literature concerning the adoption of different strategies of Greek firms, with regard to their size and according to the particular characteristics of each sector (and region), in order to obtain and exploit the required resources for increasing their productivity (Halkos and Tzeremes, 2007; Floros et al., 2014).

5. Conclusions

This article examined the developments, trends and problems pertaining to the productivity of the Greek economy, at the national, sectoral and regional levels. For this purpose, the variables of labour productivity as well as TFP were analysed for the whole country and for each region, by using a regional production function of the Cobb Douglas form, under the assumption of the existence of constant elasticity of substitution and constant returns to scale. Moreover, labour productivity was calculated for the sectors of economic activity at the national level and in each region separately.

In contrast with other countries (in the euro area, the EU and the OECD), Greece presented a reduction of labour productivity during the last decade (2008-2017), hence amplifying the divergence and lowering its competitiveness, namely, increasing its distance from the international/EU production frontier. At the same time, the TFP of the Greek economy also reduced in comparison to other countries. Despite the increase in labour productivity in (internationally) tradable goods sectors, such as manufacturing and agriculture, these sectors are still lagging behind services sectors. The results underline the need for the implementation of suitable policies which will rapidly boost the productivity and efficiency of the Greek economy, especially in internationally tradable sectors, to ensure the conditions for sustainable and resilient growth. Among others, such policies should encompass the larger and faster diffusion of new technologies and participation in global value chains.

During the period 2008-2016, the gap in productivity and TFP between the region of Attiki and the remaining regions of the country increased. Particularly, TFP decreased in all the regions (except for Dytiki Makedonia), although it has somewhat recovered since 2013. The larger reductions in both labour productivity and TFP are observed in the island regions of Voreio Aigaio, Notio Aigaio and Ionia Nisia. To the contrary, the region of Attiki reduced its productivity gap with the best-performing EU region.

The findings indicate some considerable differences in labour productivity among the sectors of a regional economy, as well as between regions with respect to a specific sector. In turn, further research is required to determine, at a finer level of analysis, the production conditions, the capital and labour shares of income, and the TFP in each region and sector of the country.⁸ The analysis of labour productivity by sector and region using firm-level data would also be very useful, e.g., with the use of disaggregate data originating from the business registry and the annual industrial surveys. Such types of analysis would allow us to measure and interpret inequalities among the frontier and laggard firms and the main determinants, such as investment, export performance, R&D expenditure, technology level, human capital and knowledge intensity.

The statistically significant and positive correlation between human capital and TFP at the regional level suggests the importance of implementing labour and education policies aiming at improving the coupling (or reducing the mismatch) between the knowledge and skills of the economically active population and the actual needs of firms. At the level of national strategic growth planning, the objectives and policies of the sectoral growth plans (e.g., for transport, energy and the digital market) should be aligned and coordinated. In addition, these plans should be integrated with the special planning frameworks for main economic activities (fisheries, mining, renewable energy, manufacturing, tourism, and logistics). In this way, more locally targeted actions will be taken to strengthen productivity and reduce inequalities, avoiding possible conflicts between sectoral and regional policies.

The exploitation of scale economies, the networking among firms with related activities and the creation of activity clusters (e.g., in manufacturing, ICT, transport

8. Such an alternative and more flexible approach, which allows using different capital and labour shares of income by country/region, thus mirroring possible variations in the production structure, can be provided by the use of a translog production function (Beugelsdijk et al., 2018).

and logistics) are particularly important for the enhancement of innovation and productivity at the local level, through providing suitable incentives, according to the comparative advantages of each region. Nonetheless, the potential effects of selected policies must always be evaluated and weighted, among other criteria, with respect to the productivity growth rate and the reduction of inequalities. For instance, policies for the technological upgrading and ICT adoption of firms in some regions could foster productivity and, at the same time, increase (with the expansion of broadband networks) or reduce (with ICT skills development policies and cloud computing technologies) the inequalities or divergence between core and peripheral regions, and among frontier and laggard firms (Sorbe et al., 2019).

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