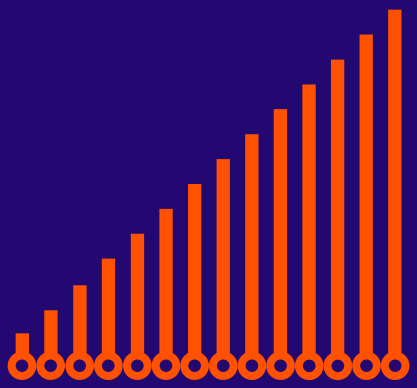
CENTRE OF PLANNING AND ECONOMIC RESEARCH

Issue 45, June 2021

GREEK ECONOMIC OUTLOOK



- Recent (macro-)economic developments
- Fiscal developments
- Human resources and social policies
- Reforms-Economic development
- Special topics

GREEK

Economic Outlook

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Editor:
Panagiotis G. Liargovas

Managing editor:
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Editing:
Helen Soultanakis

Publications Department
Information:
Christos Eleftheriadis
Τηλ.: 210 3676359

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Pappas Fotis and Co

11, Amerikis str., 106 72 Athens, Greece
Tel.: +30-210-3676.300, 210-3676.350
Fax: +30-210-3630.122, 210-3611.136
Website: www.kepe.gr

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Executive Summary

The health situation is improving and the economy is gradually returning to normality

In the last four months, we observed the simultaneous evolution of two trends: public health and the economy. In the field of health, we saw the recession of the pandemic both in new cases and in ICU patients, as well as in the loss of human lives. It is obvious that as more citizens are vaccinated, the coronavirus cases decrease. In the economic field, we see almost every day a series of positive developments that signal the gradual return to a dynamic normality.

The **economic climate index** has been growing steadily for four months.[1] Last May, the index stood at 108.6 points, compared to 97.9 points in April, marking the highest performance in the last 14 months. In essence, it returned to pre-coronavirus levels. The same happened with the **consumer confidence index.** Consumer confidence is constantly improving and this is reflected in the **increase in sales of new cars**.[2] In May 2021, sales reached 10,850, from 4,497 a year earlier, showing an increase of 141.3%, which of course is due to the lockdown that took place in May last year.

In the industry sector, there are also impressive improvements with increased production and new orders, especially from the domestic market. These are reflected in the **procurement index** compiled by IHS Markit.[3] In May, this index stood at 57.1 points, from 53.8 in April, the highest level since February 2018. The final price in May was higher than the initial 56.9 points and well above the threshold of 50 units separating growth from shrinkage. The index covering the services sector rose to a three-year high of 55.2, from 50.5 points.

Developments in the **stock market indices** are also positive (see section 1.5). After an unusual stock market year, which was characterized by increased uncertainty, the year 2021 started with positive stock returns for the first four months. More specifically, all stock market indices recorded positive returns with FTSE/Athex Basic Resources and FTSE/Athex Industrial Goods & Services indices standing out, while the banking sector is in fourth place in the performance of industry indices. Moreover, the **total value of Assets Under Custody held by domestic and foreign investors** increased, and the course of the **KEPE GRIV index** reflected a decrease in uncertainty for the expected short-run course of the Greek market, based on April 2021 estimations.

At the same time, there are still positive signs coming from the **government bond market** with the raising of funds at low borrowing costs. Note that €3 billion were raised at a historically low borrowing cost (zero coupon and re-offer yield of 0.172%) from the successful issuance of the 5-year government bond in early May 2021; the yields on the recent issues of the Greek Government Treasury bills of 13, 26 and 52 weeks remained negative, with the yield of the recent 13-week Greek Government Treasury bill in early May 2021 at a historically low borrowing cost of -0.40%. These issuances followed **Greece's credit rating upgrade** by the international rating agency S&P Global Ratings in April 2021.

Competitiveness is enhanced

Based on the data published annually by the Institute for Management Development (IMD), Greece's ranking in the International Competitiveness Index (World Competitiveness Yearbook) improved in the two years 2019-20 by 12 places.[4] Greece is ranked in 46th place in 2021, from 49th place in 2020 and 58th place in 2019 (the results presented each year concern the country's performance during the previous year). Specifically, in terms of individual indicators, Greece has improved its position compared to 2019 in the following categories:

- "Economic Efficiency", by 8 places, to 52nd place from the 60th;

1. <www.iobe.gr>
2. <https://www.newsauto.gr/offers/maios-nea-afxisi-ton-poliseon-aftokiniton-pies-markes-protimoun/>
3. <https://www.markiteconomics.com/Public/Home/PDF/PMI_Brochure_ELL>
4. <https://www.imd.org/centers/world-competitiveness-center/>

- "Government Efficiency", also by 8 places, to 52nd place from the 60th;
- "Business Efficiency", by 14 positions, to 44th position from the 58th;
- and "Infrastructure", by 2 places, to 39th from the 41st.

Big business deals are multiplying

Recently, there has been an escalation of various business agreements such as the acquisition of Chipita by the multinational giant Mondelēz International (formerly Kraft) and the successful share capital increase of Piraeus Bank, 70% of which was covered from abroad.[5] Essentially, what is observed is that **investment funds are looking for a place in the Greek market**, precisely because they see that the next period is very positive.

Exports showed strong resilience

Confirmation of these trends is the fact that, despite the pandemic, Greece was one of the few EU economies that showed an **increase in exports** of goods in real terms in 2020 (see section 4.1). According to the provisional data of the *National Accounts,* this increase amounted to 4.3%, placing the country in the third position in the EU in terms of this rate. In Greece, the impact of the pandemic on exports was felt in the second quarter of 2020, with a relatively mild negative rate of change; in the third and even more so in the fourth quarter of the year, the country recorded significant export growth. In contrast, the EU experienced on average a decline in goods exports from the first quarter, with the situation deteriorating rapidly in the second quarter, and a marginal recovery occurring towards the end of the year. In the case of the Greek economy, exports of goods have emerged over the past decade as the main demand component that shows the strongest resilience and the most favorable evolution in times dominated by adverse conditions. During the economic crisis, Greece's exports of goods showed significant and stable growth rates, helping to contain the decline in GDP and contributing to the rebalancing of external accounts. In the most recent conjuncture, where the world economy and international trade have been under the heavy impact of the Covid-19 pandemic, Greece has managed to strengthen its export activity in several of its main export products, thus largely offsetting the losses in certain major exporting sectors, most notably petroleum products. These results were linked to the country's **successful response to the epidemic waves** (see section 4.3), but were also largely related to the structure of Greek exports, mainly in terms of product composition, but also with regard to geographical destinations. Greece benefited from its significant export activity in the category of agri-food products (see section 4.2), as well as in other categories of goods, such as pharmaceutical products, the needs for which increased due to the pandemic. At the same time, the resilience of Greece's exports was enhanced by the high share and the relatively high degree of differentiation (variety) of the products exported by Greece to the the EU, as well as by the expansion of the country's export trade to the markets of Southeast Asia (e.g., wines) in the previous years. In relation to the prospects of Greece's merchandise exports for the year 2021, developments in the international environment are expected to create more favorable conditions for export growth, although the uncertainties related to the course of the pandemic still complicate significantly any assessment. Based on the indications so far, the European and world economies are expected to recover partially this year, boosting international trade in goods (see section 1.6). At the same time, the needs for pharmaceutical products are expected to remain high, while oil prices have increased compared to the previous year, a development that, combined with increased demand in this market, is expected to enhance Greece's exports of petroleum products.

Public revenues are improving

The latest data from the implementation of the budget in May (see section 2.1) showed that **total tax revenue increased** by 47 million euros or 1.6% compared to the target of the 2021 budget report[6]. The increase in revenue is even higher, reaching 12.2%, compared to the objectives of the stability program (which took into account the prolonged lockdowns of the first months of 2021, as opposed to the budget).

Employment is increasing

The result of all these positive developments is that **employment** is constantly increasing (see section 3.1). The number of new jobs has increased since last April (33,210 vs. 7,205), while in the first four months 109,091

5. <https://www.liberal.gr/apopsi/ston-asterismo-ton-big-deals-i-ellada/380791>

6. <https://www.minfin.gr>

more new jobs were created than in the respective period of 2019. However, it should be noted that the labour market underperformed compared to previous years, at least since 2014. Interestingly enough, the **share of new full-time job contracts** increased to 63.1%, which is much bigger than 50%, i.e., the maximum share in previous years. The sectors of economic activity that reported the biggest positive net flows of paid employees in the first four months of 2021 include wholesale and retail trade, education, human health services, public administration and defence, while in March and April food services, retail trade and accommodation activities exhibited dynamism as a response to the relaxing of social distancing constraints and the gradual recovery of economic activity.

Domestic and international organizations revise their estimates for 2021 growth upwards

The biggest change was made by the OECD, which revised its forecast for this year's growth from 0.9%, forecast last December, to 3.8% of GDP.[7] The European Commission revised its growth rate to 4.1% of GDP in May from 3.5% of GDP forecast in February.[8] The Bank of Greece maintains the forecast for a growth rate of 4.2% of GDP for this year.[9] The Parliamentary Budget Office announced that it now forecasts growth of 3.6% to 4.8% of GDP for this year, provided that the Recovery Fund proceeds normally and that tourism recovers a significant part of the turnover lost in 2020.[10]

KEPE's revised estimate for the GDP growth rate in 2021 is 4.7%

The short-term forecast regarding the evolution of the rate of change of real GDP for the year 2021, based on the **structural factor model of KEPE, is 4.7%** (see section 1.3). The relative estimated rates of change for the first and second halves of 2021, in relation to the respective periods of 2020, amount to the same level, while the forecasts per quarter show a purely positive sign, presenting a particularly high level in the second quarter (11.7% for the corresponding quarter of 2020) and gradual de-escalation thereafter (6.6% in the third quarter and 2.8% in the fourth quarter of the year).

The estimated short-term dynamic recovery does not mean that the risks and threats to the economy in the near future have been eliminated

First risk: The new coronavirus mutation

The recent "Delta mutation" of the coronavirus and the possible fourth wave create reasonable concern for the course of the country's economic recovery. Tourism is subject to uncertainty for the second year in a row, while the revenue target of 45% of those in 2019 is now being pushed away. If local lockdowns and additional support measures need to be taken in the autumn or earlier to address the side effects on the economy, it is clear that the €41 billion bill will grow. Can the coronavirus mutate the positive scenario of the Greek economy? Our estimate is that the potential shocks from tourism will be absorbed by the very dynamics of the economy in areas such as consumption and investment.

Second risk: Inflation

Recently, there have been increases in the **international prices of raw materials**, which have also passed into the Greek market and are now beginning to be felt in the family budget (see section 1.2). According to the data of ELSTAT, already in the first quarter of 2021, increases have been recorded[11] in meat by 17%, in fruits and vegetables by 15%, in legumes by 8%, in sugar and baby milk by 6%, in cheeses and oils by 5% and by 1% in personal hygiene items. What is worrying is that global food costs continue to rise. In fact, in May, food costs hit a decade-long record. In addition, the "Commodity Food and Beverage Monthly Price Index", the IMF's food and beverage raw material index showed a 30% increase in just one year.[12] If there is no de-escalation in the prices of international raw materials, then there is a visible risk that prices will be

7. *OECD Economic Outlook,* May 2021, Paris.

8. <https://ec.europa.eu/info/business-economy-euro/economic-performance-and-forecasts/economic-forecasts/spring-2021-economic-forecast_en#forecast-by-country>

9. <https://www.liberal.gr/economy/g-stournaras-sto-42-o-ruthmos-anaptuxis-gia-to-2021/368620>

10. <http://www.pbo.gr/el-gr/>

11. <https://www.statistics.gr/el/statistics/-/publication/DKT87/->

12. <https://www.indexmundi.com/commodities/?commodity=food-and-beverage-price-index&months=60>

affected throughout the supply chain. If that happens, the government could consider **further VAT cuts** on more basic goods to avoid a drop in real incomes.

Third risk: The inability to fully absorb Community funds and implement all projects in the next five years

In the next five years, the public and private sector of the country will be called on to implement projects whose total worth (including leverage) is 80-90 billion euros. This money comes from the Recovery and Resilience Fund, the new NSRF, the new Common Agricultural Policy and other Community aid. The planning for all Community aid **has been extremely effective**, as evidenced by the immediate approval of the Greek proposal for the Recovery and Resilience Fund by the European Commission. The bet is its **rational and timely implementation.** The Greek Public Administration has been called upon to absorb multiple resources in a shorter period of time than in the past. Unfortunately, the historical path (path dependency) of the country shows that the Public Administration cannot easily get rid of entanglements and bureaucratic procedures. The only way to do this is through the continuous and persistent efforts of governments to **implement reforms**, especially in the areas of Public Administration and Justice.

Fourth danger: The large primary surpluses

From 2023 until 2060, the Greek economy will return to the obligation to produce primary surpluses over 2% of GDP. But targets for primary surpluses of more than 2% are all about keeping the country captive at low growth rates with exactly the opposite of what big surplus advocates are pursuing or ostensibly seeking. Of course, Greece cannot solve this issue on its own as it was a product of an agreement with the institutions in the framework of the third memorandum. It can, however, form alliances with other European countries (e.g., Italy) to revise the Stability and Growth Pact in a **more developmental direction**.

Fifth risk: Private debt

According to the latest report of the State Budget Office in Parliament, the total overdue balance at the end of April 2021 amounted to €109.1 billion, an increase of €3.4 billion compared to April 2020.[13] This increase is broken down into (a) €1.2 billion in arrears previously confirmed; (b) €7.6 billion in new arrears; and (c) €5.4 billion in receivables and write-offs. Inflation of private debt is not just a budget issue. If not addressed in a timely manner (e.g., by extending the installments), it **could lead to unpredictable developments** on the front lines of both unemployment and social cohesion.

Sixth risk: The demographic trends

From 2010 onwards, the country's population has been declining rapidly mainly due to the migration of young people to other countries. From 2020, due to mass retirement and the aging of the population, there has been a dramatic increase in retirees. According to Eurostat, Greece is the second oldest country in the European Union as 3 Greeks who were of productive age in 2017 corresponded to an elderly person over 65 years old.[14] The fertility rate is very low, at only 1.2 children. However, maintaining the Greek population at current levels after 30-40 years requires a fertility rate of 2.2 children. So Greece will grow older and shrink continuously in the coming years. The problem must be addressed immediately, mainly through tax incentives, following the best practices of other countries (e.g., France).

Professor PANAGIOTIS LIARGOVAS
Chairman of the Board and Scientific Director of KEPE

13. <http://www.pbo.gr/el-gr/>

14. <https://ec.europa.eu/eurostat/databrowser/view/tps00198/default/table?lang=en>

1. Recent (macro-)economic developments

KEPE, *Greek Economic Outlook,* issue 45, 2021, pp. 7-14

1.1. The evolution of the main components of demand during the Covid-19 pandemic

1.1.1. Introduction – Domestic and external demand for 2020

Yannis Panagopoulos

This section records the general trends concerning the main components of demand until the end of 2020. By extension, the analysis of the macroeconomic data mainly incorporates the negative effects of the Covid-19 pandemic, since its outbreak in March 2020 and for the whole year.

Based on the annual data of the *National Accounts* (ELSTAT), as shown in Table 1.1.1, we observe the serious negative change in the growth rate of the Greek economy compared to 2019. More specifically, in contrast to the growth of 2019, the recession of the economy in 2020 was 8.25%. We could even briefly point out that the main macroeconomic factors for the 2020 recession, compared to 2019, were the negative percentage in total exports (from 4.84% to -21.67%) and in private consumption (from 1.89% to -5.15%). On the other hand, we had a positive percentage, compared

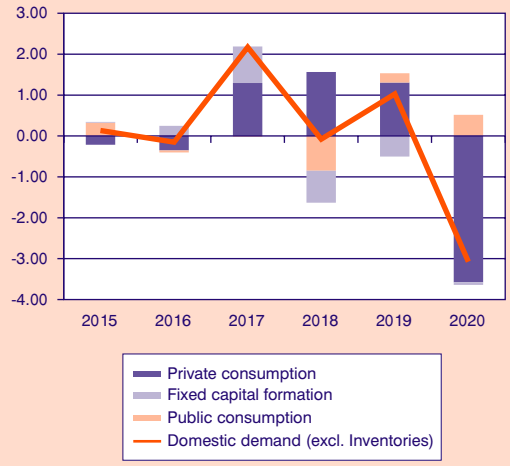
TABLE 1.1.1 Basic macroeconomic variables *(non-seasonally adjusted data)*

	In million euros (current prices)	Annual % change (constant prices)	
	2020	2019	2020
Private consumption	118,935	1.89	-5.15
Public consumption	37,113	1.19	2.74
Fixed capital investment	18,433	-4.63	-0.65
Domestic demand*	161,959	1.09	-3.12
Exports of goods and services	52,880	4.84	-21.67
Exports of goods	30,020	1.99	4.31
Exports of services	22,859	7.34	-42.95
Imports of goods and services	65,402	2.95	-6.81
Imports of goods	49,199	2.30	-3.67
Imports of services	16,204	4.90	-16.02
Balance of goods and services (% GDP)	-7.55		
GDP	165,830	1.86	-8.25
Contribution to the GDP			
Domestic demand*		1.03	-3.07
Balance of goods and services		0.66	-5.62
Change of inventories		0.16	0.67

Source: National Accounts, ELSTAT.

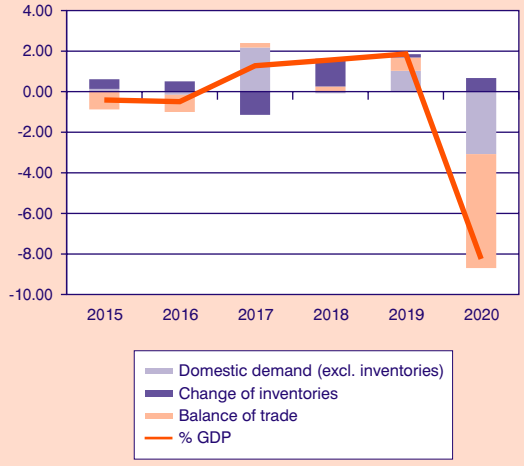
* Without change of inventories.

FIGURE 1.1.1a
Sub-components of domestic demand



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

FIGURE 1.1.1b
Domestic and net external demand



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

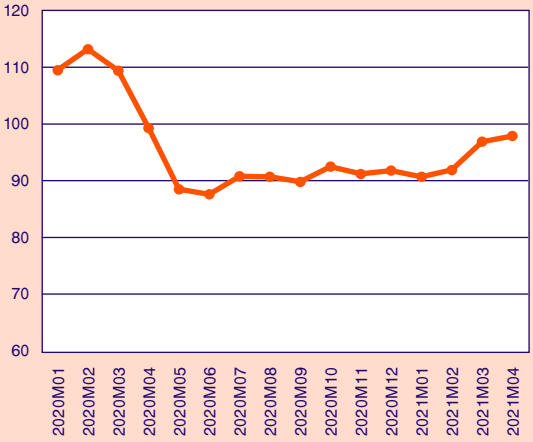
to 2019, for public consumption (from 1.19% to 2.74%), fixed capital investment (from -4.63% to 0.6%) and, mainly, for exports of goods (from 1.99% to 4.31%).

As regards to the existing components of domestic demand, which are also recorded in Figure 1.1.1a, we observe the negative contribution of private consumption, with -3.58, as the dominant one. In addition, fixed capital investment, with -0.07, contributed negatively to the domestic demand for 2020. Only public consumption contributed positively, with 0.52. In conclusion, as shown in Table 1.1.1 and in Figure 1.1.1a, in contrast to the 2019 data, the overall contributing factor of domestic demand to GDP growth is considered as strongly negative (-3.07) for 2020.

In line with the above analysis, Figure 1.1.1.b also shows the participation of the domestic and external demand sectors (i.e., the balance of goods and services) in GDP growth for 2020. Except for the small positive contribution of the change in inventories (0.67), the overall picture was negative. Actually, both the balance of goods and services (-5.62) and the domestic demand (-3.07) factors shared almost the total contribution to the 2020 GDP recession.

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 both business and household perspectives. It is also an important indicator for the economy and can be used for predictions relating to the future of GDP

FIGURE 1.1.2
Economic Sentiment Index (2020-21)



Source: Eurostat.

growth. As demonstrated by Figure 1.1.2, the ESI presents a period of more than one year (1/2020-4/2021). More specifically, it is relatively stagnant, around 90 points, from May to December 2020. The Index, from the beginning of 2021, gradually changed upwards and, until April 2021 reached 97.9 points. With the end of the official lockdown and with the progress in vaccinating of the total population, it is expected that the ESI will make an impressive increase.

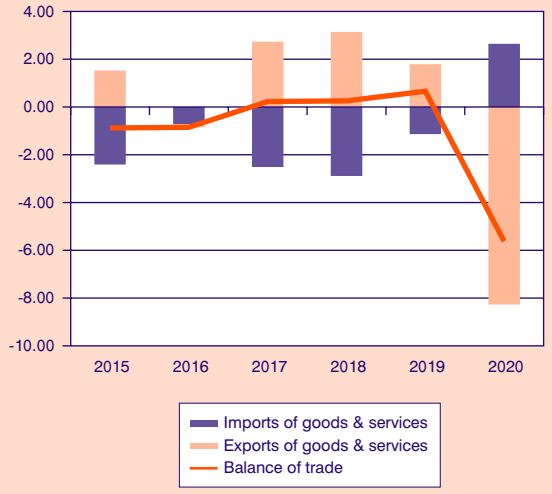
Next, a more detailed discussion follows on the contribution of the trade balance of goods and services (external sector) with respect to the GDP recession, for 2020.

Balance of goods and services

The contribution of the external sector (exports less imports) to GDP growth for 2020, as already mentioned above, is generally negative as it mainly reflects the importance of international demand.

Next, in more detail, we will analyze the rate of change in goods and, separately, the rate of change in services. Starting with exports, it should be initially stressed that services constitute the relatively smallest part of total exports and, as shown in Table 1.1.1, appear with a very large annual decrease of 44.9% for 2020 while, in contrast, goods, which are the largest part of total exports, appear with an annual increase of 4.3%. On the other hand, it was fortunate that the imported services had an annual decrease of 16.0%, while the imported goods had a much smaller annual decrease of 3.6%.

FIGURE 1.1.3
Sub-components of external demand



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

With regard now to the total contribution of the balance of goods and services to the rate of change in GDP, we should reiterate that it stood at -5.6 points for 2020, as opposed to 0.66 points in 2019. In more detail, we observe the significant negative contribution of exports to GDP, estimated at 8.27 points, while, on the other hand, the (positive) contribution of imports to GDP was at 2.65 points. This unusual record of a negative contribution of exports and a positive contribution of imports to GDP is also demonstrated in Figure 1.1.3, which shows the awkward change in the respective import and export histograms compared to those presented from 2017 to 2019.

1.1.2. Private consumption and investment

Konstantinos Loizos

1.1.2.1. Private consumption

Components of private consumption fell due to the new wave of the pandemic

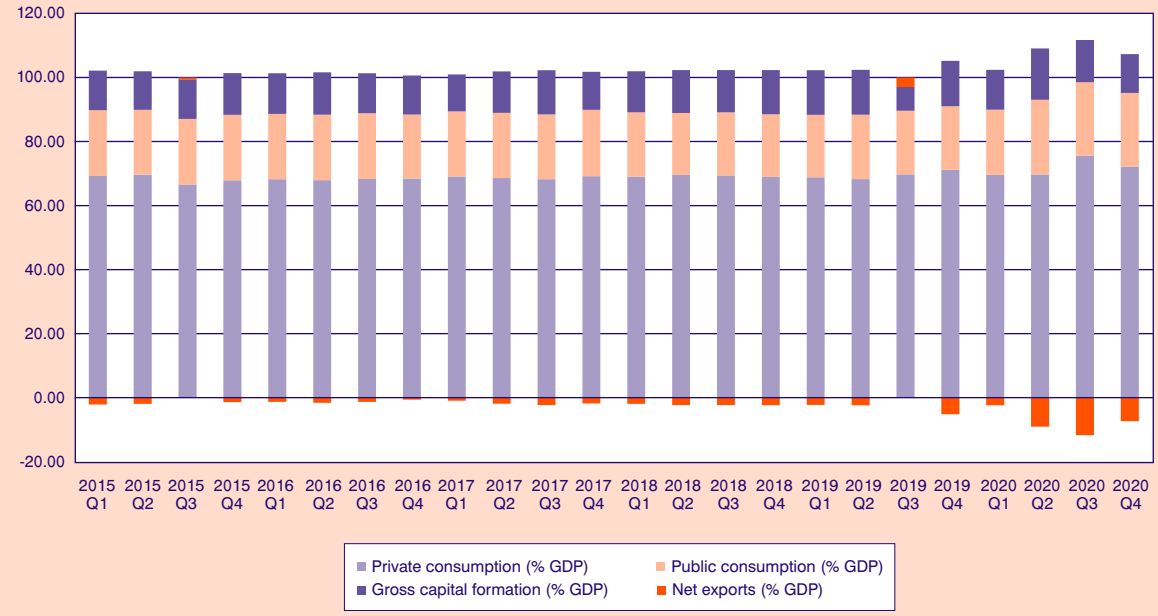
According to the quarterly seasonally adjusted *National Accounts,*[1] private consumption decreased to 29,749 million euros in current prices during the fourth quarter of 2020, lower than 30,803 million euros recorded in the third quarter of the same year. At the same time, in terms of chain-linked volumes (year of reference 2015), private consumption fell to 30,548 million euros in the fourth quarter of 2020 with respect to a value of 31,237 million euros during the third quarter in that year. Consequently, there was a decline in private consumption expenditure in the fourth quarter compared to the third quarter. This reduction manifests itself also in the relevant percentage changes[2] of seasonally adjusted chain-linked volumes. Hence, private consumption reduced at a rate of -4.7% in the fourth quarter of 2020 with respect to the fourth quarter of 2019, and at -2.2% with respect to the immediately preceding quarter.

In addition, private consumption as a percentage of GDP decreased in the fourth quarter to 72.16%, from 75.59% of GDP in the third quarter of 2020 (Figure 1.1.4). On the contrary, public consumption increased from 22.93% in the third quarter to 23.03% of GDP in the fourth quarter of 2020. A reduction has also been

1. *Quarterly National Accounts,* Press release, ELSTAT, March 5, 2021.

2. Percentage changes are calculated by the formula $\frac{(X_t - X_{t-1})}{X_{t-1}}$.

FIGURE 1.1.4
Evolution of private consumption and other components of demand as a percentage of GDP
(expenditure approach) (seasonally adjusted data in current prices)



Source: ELSTAT, data processing by the author.

observed in gross capital formation (fixed capital and changes in inventories) as a percentage of GDP between the third and fourth quarters, from 13.17% to 12.13%, whilst the negative value for net exports decreased from -11.70% in the third quarter to -7.31% in the fourth quarter of 2020. In short, the rebound of the Covid-19 pandemic during the last quarter of 2020 had a significant impact on the components of private demand, which was only partially offset by the higher levels of public consumption.

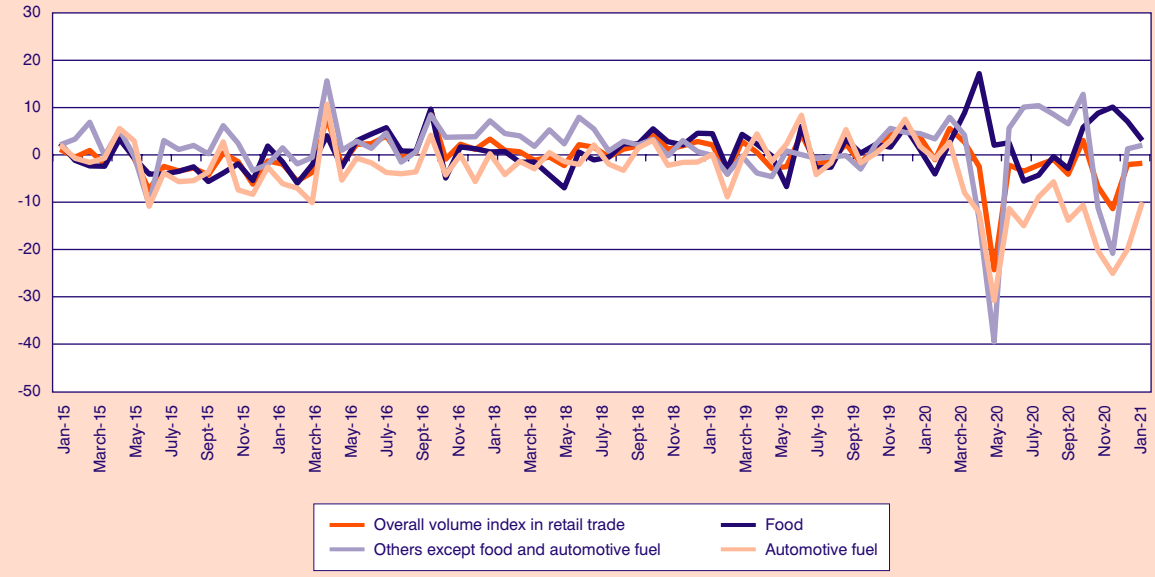
Adverse effects on retail trade, except for food items, due to the second wave of the Covid-19 pandemic

Figure 1.1.5 depicts the evolution of retail trade according to the monthly data provided by ELSTAT. Despite a short-lived recovery in October, the overall volume index in retail trade followed a falling trend during the subsequent period until February 2021. The relevant percentage changes varied between -1.78% (in February 2021) and -11.39% (in December 2020). Also, the average percentage change was negative (-3.83%) for the semester starting in September 2020. There was a similar negative trend during this semester, which includes the first two months of 2021, for automotive fuel, with an average percentage change of -16.62%. Other items except food and automotive fuel also manifest a negative average percentage change, though of a much smaller magnitude (-1.55%) since, in this case, the profound negative trend in November and December of 2020 was offset by positive percentage changes in the rest of that period. Finally, there is a completely different situation in food items, with persistent positive percentage changes from October 2020 onwards and an average percentage change of 5.32% during the whole semester. Hence, developments in retail trade during the second wave of the pandemic, with respect to the same bout of the previous year, were negative, with the only exception being the food items.

Despite fluctuations, expectations in retail trade significantly recovered in March and April 2021

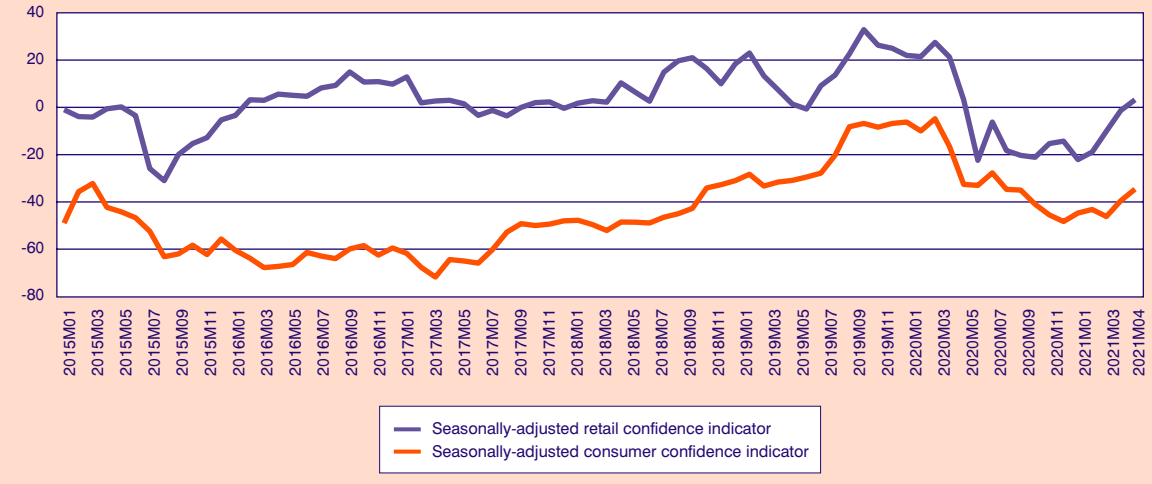
Confidence indicators published by EUROSTAT (Figure 1.1.6) show two distinct patterns during the period starting in September 2020 and lasting until April 2021. During the first sub-period ending in February 2021, both retail and consumer confidence indicators fluctuated without exhibiting any clear trend. On the contrary, in

FIGURE 1.1.5
Percentage changes in the seasonally adjusted overall volume index and the main sector indices in retail trade



Source: ELSTAT, data processing by the author.

FIGURE 1.1.6
Confidence indicators in retail trade



Source: EUROSTAT, data processing by the author.

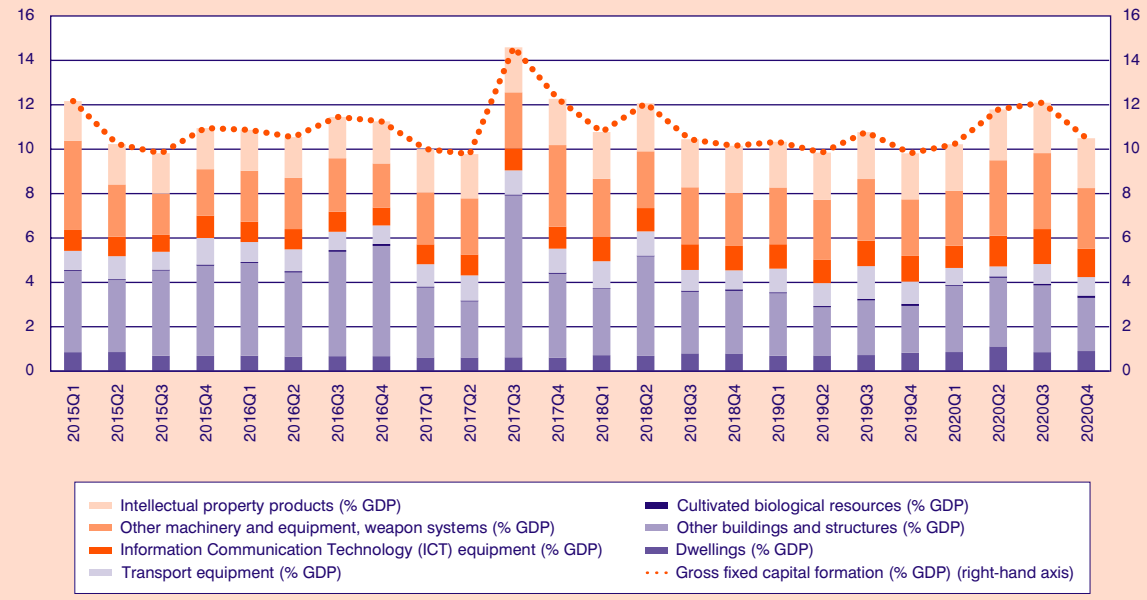
March and April 2021, there was a definite and steep upward trend in both indices that might be justified as a precursor of positive developments in retail trade. Such optimism is probably based on the perceived progress in vaccinations and the imminent opening of the economy at a greater scale.

1.1.2.2. Investment

Ambiguous developments in investment during the fourth quarter

Gross fixed capital formation reduced to 4,327 million euros in current prices in the fourth quarter of 2020,

FIGURE 1.1.7
Gross fixed capital formation as a percentage of GDP (overall and by asset)
(seasonally adjusted data in current prices)



Source: ELSTAT, data processing by the author.

down from 4,929 million euros in the third quarter of that year. However, in terms of chain-linked volumes, there was a rise in gross fixed capital formation to 4,744 million euros in the fourth quarter of 2020 from 4,696 million euros in the third quarter. This rising trend in the last quarter of 2020 is also confirmed in terms of percentage changes with respect to both the preceding quarter (1.0%) and the corresponding quarter in the previous year (1.6%), based on the seasonally adjusted chain-linked volumes.

On the other hand, developments in the contribution of investment and its components to GDP (Figure 1.1.7) were negative during the last quarter of 2020 which coincides with the second wave of the pandemic. Specifically, gross fixed capital formation and most of its components reduced their share in GDP in the fourth quarter with respect to the third quarter of 2020. In particular, there is a reduction in machinery and transport equipment, in terms of percentage changes, in both its total (-17.70%) and its individual components. At the same time, buildings in total manifested a negative percentage change in the last quarter of 2020 (-14.48%), despite a small positive percentage change in dwellings (5.90%).

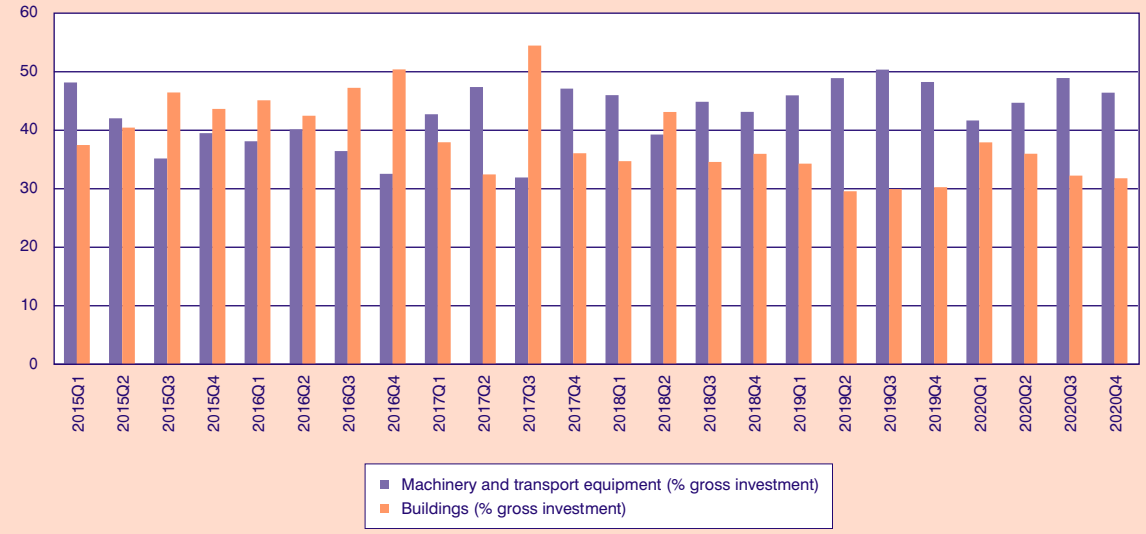
Machinery and transport equipment predominates over buildings

Regarding the two main components of gross investment, machinery and transport equipment still predominates over buildings. Therefore, in the fourth quarter of 2020, the share of machinery and transport equipment in total gross fixed capital formation remained higher (46.14%) than that of buildings (31.46%), despite the fact that it fell compared to its share during the third quarter of 2020 (48.65%). Since this is a persistent feature of the data about the main components of investment (as of the third quarter of 2018), it is an interesting finding that invites further research concerning the possible impact on the structure of gross investment in the Greek economy during the last few years.

Persistently favourable expectations in the construction sector as of January 2021

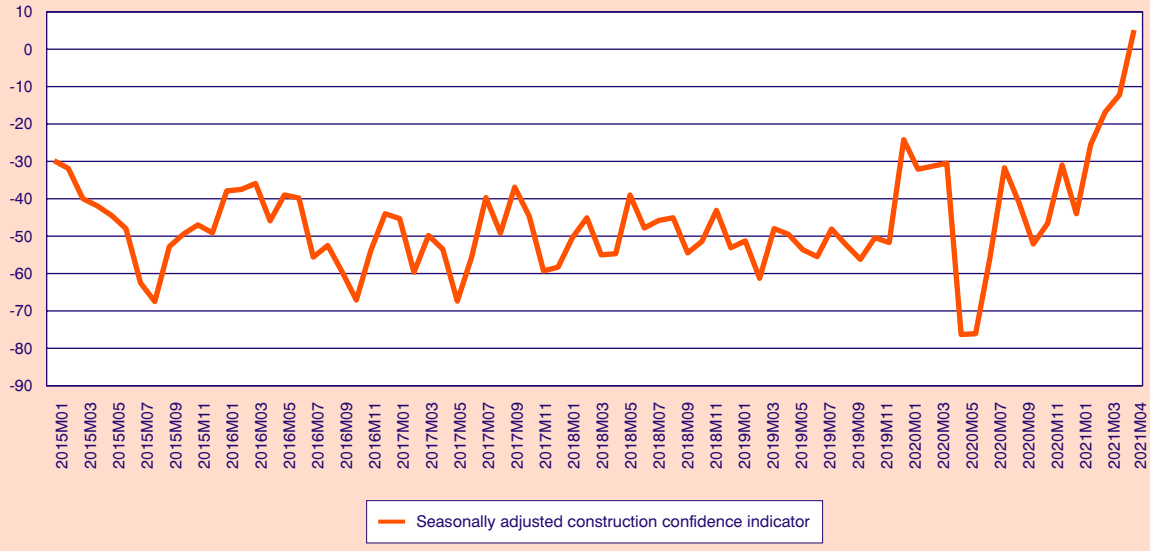
The evolution of business expectations in the construction sector is depicted in Figure 1.1.9. The main result is a positive trend in the construction confidence index during the first four months of 2021, despite its

FIGURE 1.1.8
Machinery and transport equipment and buildings as a percentage of gross fixed capital formation



Source: ELSTAT, data processing by the author.

FIGURE 1.1.9
Construction confidence indicator



Source: EUROSTAT, data processing by the author.

fluctuation until the end of 2020. This finding could be explained as reflecting a favourable business sentiment in this sector. Moreover, for the first time in the last five years, this index recorded a positive value (5.1) in April 2021, possibly because economic agents discount a recovery in building activity in the context of the imminent opening of the economy as vaccinations gather pace.

1.1.2.3. Conclusions

The above analysis showed that the Greek economy manifested two major trends during the second wave of the pandemic. On the one hand, it suffered from negative effects in most components of demand and especially in private consumption, except food items. At the same time, positive developments in public consumption and ambiguous effects in investment were not able to reverse the overall negative trend in most components of demand expressed as percentages of GDP. On the other hand, there is a clear increase in confidence both in retail trade and in construction as precursors of an expected economic recovery, as the country is now going through the phase of gradually building immunity in the population through vaccinations, and it is hoped that tourism will provide significant support for Greece's economy.

KEPE, *Greek Economic Outlook,* issue 45, 2021, pp. 15-18

1.2. Higher Energy prices drive inflation in Greece and in Eurozone

Emilia Marsellou

Greece

Energy prices have been the key factor driving the Consumer Price Index (CPI) over the last few months in Greece and in the global economy. The increase in oil prices is partly due to the positive expectations for global demand. However, the price indices of the remaining sub-groups of goods and services in Greece continue to record negative rates of change.

According to ELSTAT statistics, the National CPI in May 2021 recorded an annual marginal increase of 0.1% for the first time since the outbreak of the COVID-19 pandemic in Greece and the imposition of the first lockdown in March 2020. Already, from April 2021, the de-escalation of the index reductions had begun to appear, recording a decline of only 0.3% compared to the much higher reductions of the first quarter of 2021 (Table 1.2.1.). A decisive factor for this development is the significant recovery of Energy prices over the past two months, which continued even more strongly in May. As a result, the core[1] CPI in May 2021 remained in negative territory, recording a decrease of 1.7%. A decrease was also recorded in the HICP by 1.2% as well as in the core of the HICP (-3.1%).

More specifically, the annual increase of the General CPI in May 2021 by 0.1% is a combined result of

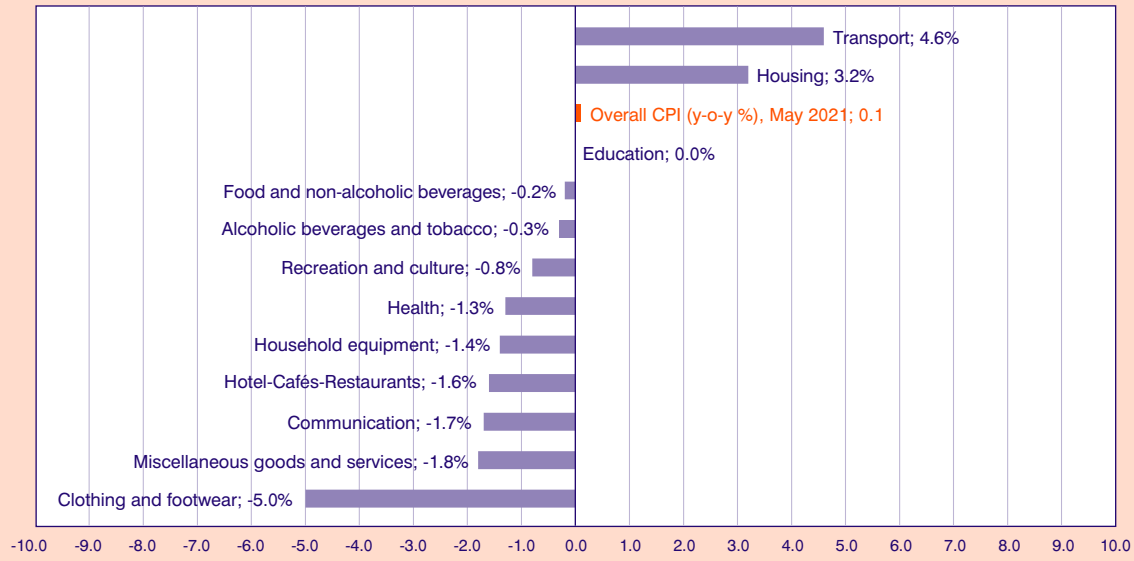
TABLE 1.2.1 Inflation in Greece (%)

	Headline inflation (Greece)	Core inflation (Greece)	Harmonized inflation (Greece)	Core Harmonized inflation (Greece)
2020:M1	0.9	0.7	1.1	1.0
2020:M2	0.2	0.3	0.4	0.4
2020:M3	0.0	1.1	0.2	0.9
2020:M4	-1.4	-0.1	-0.9	0.0
2020:M5	-1.1	0.4	-0.7	0.3
2020:M6	-1.6	-1.4	-1.9	-2.4
2020:M7	-1.8	-1.3	-2.1	-2.2
2020:M8	-1.9	-1.4	-2.3	-2.4
2020:M9	-2.0	-1.6	-2.3	-2.6
2020:M10	-1.8	-1.4	-2.0	-2.2
2020:M11	-2.1	-1.8	-2.1	-2.3
2020:M12	-2.3	-2.0	-2.4	-2.5
2021:M1	-2.0	-1.3	-2.4	-2.3
2021:M2	-1.3	-1.0	-1.9	-2.1
2021:M3	-1.6	-2.8	-2.0	-3.2
2021:M4	-0.3	-1.6	-1.1	-2.3
2021:M5	0.1	-1.7	-1.2	-3.1

Source: ELSTAT.

1. The Core Inflation Index is calculated from the Overall Consumer Price Index excluding the divisions of Food and non-alcoholic beverages, Alcoholic beverages and tobacco and Energy prices.

FIGURE 1.2.1
Annual changes in CPI sub-categories (May 2021)



Source: ELSTAT.

the following changes in the price indices of the sub-groups of goods and services. More specifically, increases were recorded by

- **3.2% in the Housing sector.** This increase, which is mainly due to the significant rise in the prices of *Heating oil (+28.9%)* and *Natural gas (+31.8%),* was partly offset by the fall in the price of *Electricity (-0.9%).*
- **4.6% in Transport.** This increase is mainly attributed to the rise in the prices of *Fuels and lubricants (+19.4%),*[2] *New motorcars (+3.3%)* and *Tickets for passenger transport by air (+3.6%).*[3]
- On the other hand, prices decreased in the following groups of goods and services:
- **-0.2% in Food and non-alcoholic beverages.** This is mainly due to the fall in the prices of *breakfast cereals (-5.4%), pork (-4.3%), yoghurt (-5.0%), fresh fruit (-11.4%)* and *soft drinks (-7.4%)*. This decrease was partly offset by the increase, mainly, in the prices of *lamb and goat (+14.5%), poultry (+4.0%), fresh fish (+6.1%), cheese (+0.9%), olive oil (+1.1%), other edible oils (+13.8%), fresh vegetables (+3.0%)* and *potatoes (+3.5%)*.
- **-0.3% in Alcoholic goods and tobacco.** This decrease is mainly attributed to the fall in the prices of *Wines (-2.3%)*.
- **-5.0% in Clothing and footwear.** This decrease is mainly attributed to the fall in the prices of *Clothing and footwear*.
- **-1.4% in Household equipment.** This is mainly due to the decrease in the prices of *Household textiles (-4.9%)*, *Glassware-tableware and household utensils (-4.6%)* and *Non-durable household goods (-2.1%).*
- **-1.3% in Health,** which is mainly attributed to the fall in the prices of *Pharmaceutical products (-4.3%).* This decrease is partly offset by the increase, mainly, in the prices of *Medical, dental and paramedical services (+0.6%).*
- **-1.7% in Communication,** due to the decrease, mainly, in the prices of *Telephone services (-2.0%).*

2. In more detail: Diesel +20.6%, Gasoline +20.2%, Other fuels +14.5% and Lubricants -0.1%.

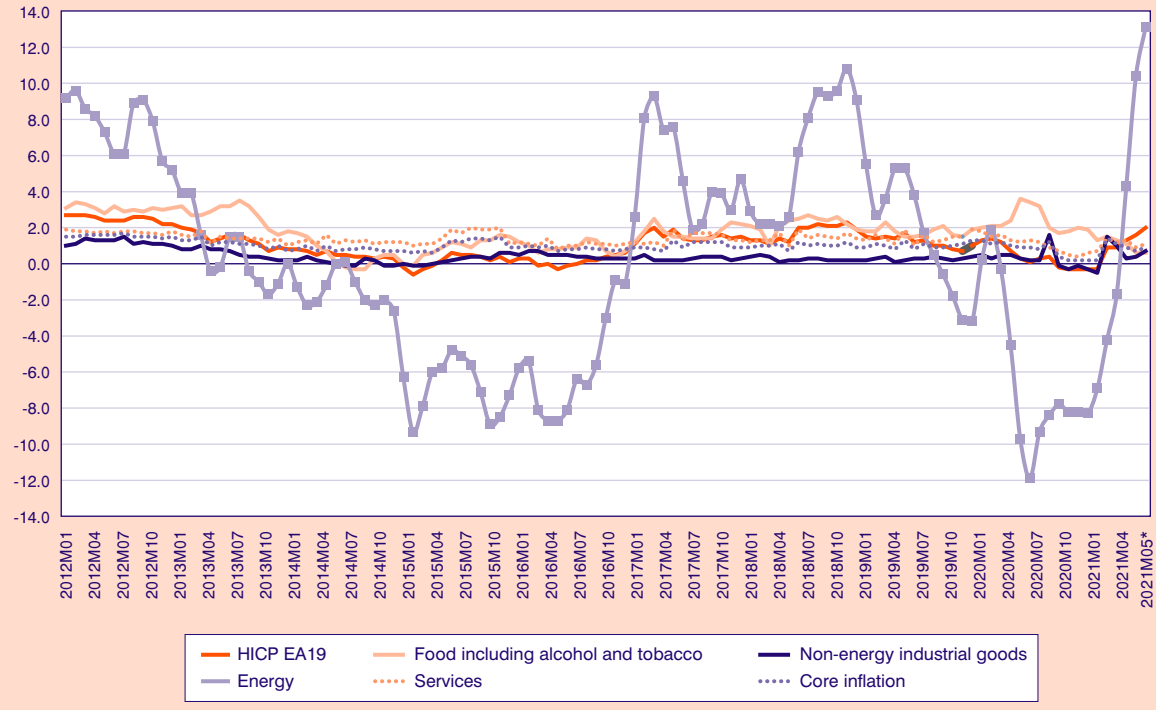
3. The consumer price sub-indices of the rest of the Transport categories recorded decreases: Tickets for passenger transport by railway -12.3%, Tickets of passenger transport by road -8.8% and Tickets of combined passenger transport -12.4%.

TABLE 1.2.2 Annual changes in CPI sub-categories, January-May 2021

Groups of goods and services	Jan	Feb	March	Apr	May
1 Food and non-alcoholic beverages	-0.4	-0.5	-0.3	-1.2	-0.2
2 Alcoholic goods and tobacco	-0.4	0.1	-0.5	-0.1	-0.3
3 Clothing and footwear	-3.5	-0.1	-16.9	-1.1	-5.0
4 Housing	-3.4	-1.9	0.1	1.9	3.2
5 Household equipment	-2.2	-2.2	-1.7	-1.2	-1.4
6 Health	-1.2	-1.1	-1.1	-1.0	-1.3
7 Transport	-5.7	-4.3	-0.8	2.3	4.6
8 Communication	-2.1	-1.8	-1.6	-1.4	-1.7
9 Recreation and culture	-0.6	-0.3	-0.3	-1.0	-0.8
10 Education	0.0	0.0	0.0	0.0	0.0
11 Hotel-Cafés-Restaurants	-0.6	-0.4	-0.5	-0.9	-1.6
12 Miscellaneous goods and services	-2.4	-1.7	-1.4	-2.4	-1.8
General Index	**-2.0**	**-1.3**	**-1.6**	**-0.3**	**0.1**

Source: ELSTAT.

FIGURE 1.2.2
HICP in the euro area, annual change (2015=100)



Source: Eurostat. (* flash estimates).

- **-0.8% in Recreation and culture.** This decrease is mainly attributed to the fall in the prices of *Major durables for outdoor recreation (-3.1%).*
- **-1.6% in Hotel-Cafés-Restaurants.** This decrease is mainly due to the fall in the prices of *Hotels, motels, inns and similar accommodation services (-21.1%).*
- **-1.8% in Miscellaneous goods and services.** This decrease is mainly attributed to the fall in the prices of *Other appliances and articles for personal care (-4.9%)* and *Other personal effects n.e.c. (-3.3%).*

The Euro area

Inflation in the Eurozone in May 2021 is expected to reach 2.0% according to the flash estimates announced by Eurostat (1/6/2021). These estimates further reinforce the positive course of inflation that began in January 2021. Regarding the main consumer price sub-indices, in May 2021 in the Eurozone, the largest increase was recorded in Energy prices (+13.1% vs. +10.4% in April) followed by Services (+1.1% vs. +0.9% in April) and Non-energy industrial products (+0.7% vs. +0.4% in April), while the index for Food, alcohol and tobacco is expected to remain stable (+0.6%).

Among the Eurozone member states, the countries with the highest inflation are expected to be Luxembourg (+4.0%), Lithuania (+3.5%) and Estonia (+3.1%). In contrast, the countries that experienced the lowest inflation are Greece (-1.1%), Portugal (+0.5%) and Italy (+1.3%).

KEPE, *Greek Economic Outlook,* issue 45, 2021, pp. 19-21

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 2021,[1] based on KEPE's dynamic structural factor model.[2] The underlying time series database used to estimate the model and produce the forecasts includes 121 variables,[3] covering the main aspects of economic activity in the country on a quarterly basis and spanning the time period from January 2000 up to March 2021.

As pointed out in the more recent issues of the *Greek Economic Outlook*, the exceptional and constantly changing conditions caused by the COVID-19 pandemic significantly complicate the conduct of projections concerning the course of real GDP, due to both the ensuing unprecedented uncertainty and the continuous alternation between periods of wide-ranging restrictive measures and periods of partial and gradual lifting of restrictions. Moreover, as was the case during the preceding period of reference, the quantification of the compensatory effects of measures implemented to deal with the pandemic and shield the economy and the evaluation of the impact of the recent partial lifting of restrictions are not straightforward. In addition, the technical forecasting procedure followed cannot take into account policy measures that could potentially have major effects on economic activity, such as the disbursement and progressive utilization of funds provided within the framework of the Recovery and Resilience Facility.[4]

According to the factor model econometric estimates presented in Table 1.3.1 and having incorporated published (provisional) data up until the first quarter of 2021,[5] the mean annual rate of change of real GDP for 2021, as well as the related mean rates of change for the first and second halves of 2021, are all forecasted at 4.7%. Moreover, all the projected year-on-year quarterly rates of change exhibit positive signs, with the respective percentage changes being highest in the second quarter (at 11.7%) and gradually declining thereafter (6.6% in the third and 2.8% in the fourth quarter of the year). Against this background, it seems that in the nine-month period April-December 2021, the Greek economy will follow a recovery path. The observed variation in the forecasted quarterly rates of change of real GDP is somehow anticipated, given

1. The date of the forecast is June 23, 2021.

2. A detailed description of the model can be found in Issue 15 (June 2011, pp. 19-20) of KEPE's scientific journal entitled *Greek Economic Outlook*. See <https://www.kepe.gr/images/oikonomikes_ekselikseis/issue_15enb.pdf>.

3. The database incorporates both real economy and nominal variables, as well as a considerable number of variables reflecting expectations and assessments of economic agents, as reported in earlier issues of the *Greek Economic Outlook*. By way of exception, the underlying data sample does not include five variables related to individual subcategories of employment and unemployment aggregates, which are otherwise used as standard practice, due to the non-availability of detailed data from the Quarterly Labour Force Survey for the first quarter of 2021 at the time of conducting the forecasts. The seasonal adjustment of the time series is carried out by use of the Demetra+ software, using the TRAMO/SEATS filter.

4. Note that the implementation of the dynamic factor model does not involve the explicit estimation of any effects caused by policy measures (policy neutral model), while the model itself is not suitable for a straightforward analysis of the impact caused by huge shocks, such as the COVID-19 pandemic, which create abnormal economic conditions and lead to sudden and extreme (away from the trend-determined course) shifts in GDP. Still, the model implicitly takes into account any impact, through the incorporation of the economic variables updated to the most recent period of reference (first quarter of 2021). Note that the forecasts are obtained on the basis of a small number of 'factors', which summarise the information provided by a large number of explanatory variables, employing the procedure of principal components, with the aim to preserve as much of the variability of the underlying economic series as possible. Hence, in the current conjuncture, any assessment of the provided forecasts should be subject to the degree to which all short-run fluctuations in real economic activity are reflected and should, further, take into account the increased heterogeneity in the dynamic response of the economic series, in combination with the occurrence of outliers. In addition, the underlying data sample, which relies on quarterly data with a hysteresis of one quarter, does not mirror the most recent swift changes on a daily or weekly basis. All the aforementioned limitations might, in the current juncture, affect the forecasting performance of the factor model employed.

5. According to the most recent ELSTAT *Quarterly National Accounts* publication, dated June 4, 2021.

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

	2021		
Quarters	**2021Q2**	**2021Q3**	**2021Q4**
Quarterly rate of change	11.67 [10.69 , 12.66]	6.57 [5.08 , 8.09]	2.77 [1.11 , 4.46]
Mean rate of change, 1st half *	4.69 [4.20 , 5.18]	-	
Mean rate of change, 2nd half **	-	4.67 [3.10 , 6.27]	
Mean annual rate of change ***		4.68 [3.65 , 5.73]	

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

* The mean rate of change for the first half of 2021 and the mean annual rate of change for 2021 incorporate the officially available (provisional) data for the first quarter of 2021, on a seasonally adjusted basis.

that the depth of the contraction in 2020 recorded a similar course, mounting in the second quarter of 2020 and de-escalating afterwards.

The above-presented forecasts for 2021 point to a favourable development in economic conditions in the country, resulting from improving health conditions and the implied re-opening of many significant sectors of the economy. These encouraging prospects were already reflected during the first quarter of 2021 in the positive course of a number of economic variables incorporated in the model. In more detail, the corresponding observations for the first quarter of 2021 (compared to the respective quarter of 2020), on a non-seasonally and non-calendar adjusted basis, indicated a remarkable increase in overall investment and all investment sub-categories. They also pointed to a further increase in goods exports, alongside a continuing increase in consumption expenditure by the General Government. Rising trends characterized the General Industrial Production Index and the related sub-indices, with the exception of the index for *durable consumer goods*. With reference to the Turnover Index in Industry, an increase was recorded in the general index and all the sub-indices for the external market, as well as in the individual categories of *intermediate* and *capital goods* for the internal market. Private building activity was enhanced, in terms of volume and on the basis of permits issued, while the turnover index in wholesale trade increased modestly.

In contrast, the negative impact of the pandemic was reflected in the path of private consumption expenditure, which declined significantly in the first quarter of 2021, as compared to the respective quarter of 2020. In correspondence with the developments in private consumption, the Overall Volume Index in Retail Trade fell, despite the marginal increase of the *supermarkets* sub-index and the significant rise of the *food-beverages-tobacco*, *pharmaceutical products-cosmetics* and *furniture-electrical equipment-household equipment* sub-indices. The tourism sector continued to be severely hit by the repercussions of the pandemic, with the reduction in tourism receipts reaching 85.9% and the decline in transport receipts persisting. These developments were translated into a considerable fall in services exports. As to the domestic labour market conditions, the moderate decline in total employment recorded up until the last quarter of 2020 was followed by a sharp fall of -5.4% in the number of persons employed in the first quarter of 2021, as compared to the respective quarter of 2020. Still, the number of unemployed kept falling, at least marginally.

With regard to indicators depicting expectations and assessments formed by economic agents concerning the course of economic activity, the first quarter of 2021 was characterized by positive developments on a q-o-q basis, i.e., as compared to the last quarter of 2020. More specifically, business expectations in industry, retail trade and construction were reinforced, while the Economic Sentiment Indicators for Greece and the EU, as well as the General Index of the Athens Stock Exchange, increased. Finally, improvements were observed in terms of several competitiveness indicators.

The projected course of real GDP in 2021 may evolve according to a more or less favourable scenario (than implied by the aforementioned projections), condition-

al upon the repercussions of a number of crucial and dynamic factors, of which several are directly linked to the evolution of the pandemic. These factors are expected to determine, among other things, the demand and supply dynamics in Greece, the country's export performance, the investment and saving decisions of households and enterprises, the developments in employment and unemployment and, hence, income, as well as the financial conditions and the course of fiscal aggregates.

Factors that could potentially operate in the positive direction include: (a) the predominance of a positive scenario with reference to the evolution of the pandemic and progress made in the field of vaccinations, which will allow the further re-opening of economic activities and the creation of a secure environment at the domestic and international levels, (b) the gradual rebalancing of fiscal aggregates, with a targeted adjustment of compensatory economic measures in order to preserve the support for businesses and households in sectors that continue to be severely hit by the pandemic, and (c) the initiation of the National Recovery and Resilience Plan, by making use of the Recovery and Resilience Facility resources, in order to boost investment and complete crucial structural reforms with the aim to transform and promote innovation in the Greek economy.

Factors that could potentially operate in the negative direction include: (a) the prevalence of a fourth wave of the pandemic during the second half of 2021, if it is severe enough to once again negatively affect economic activity in the country, (b) the high degree of uncertainty concerning the overall evolution of the pandemic, which could cause, among other things, a further withholding of private consumption, (c) the potential escalation of inflationary pressures in the Eurozone, with possible implications for policy decisions concerning interest rates or the early withdrawal of support measures for the European economy, and (d) any developments in the direction of intensifying geopolitical tension.

1.4. Can tourism save 2021 GDP growth?

Nikolaos Rodousakis
George Soklis

1.4.1. Introduction

In 2020, the Greek economy faced a strong blow due to the international spread of the coronavirus (COVID-19). Thus, the Gross Domestic Product (GDP) fell by 8.2%.[1] This major recession in the Greek economy was primarily a result of the deterioration of the balance of goods and services, over 10 billion euro compared to 2019, and secondarily, due to the sharp decline in private consumption, over 6 billion euro compared to 2019. In particular, the exports of goods and services decreased by 21.7%, while the fall of 6.8% for imports was not sufficient to limit the deterioration of the balance of goods and services. In turn, the decline in exports was caused exclusively by the decline in exports of services of about 44%, while exports of goods recorded a small increase of 4.3%.[2]

The fall in exports of services was caused by the significant reduction of travel receipts recorded during 2020. In particular, incoming passenger traffic decreased by about 78.2% and amounted to 7.406 million visitors, versus 34 million visitors in 2019, while the travel receipts in 2020 amounted to 4,319 million euro, a decrease of about 76.2% compared with 2019.

For the period January-March 2021, the travel receipts reduced by 511 million euro (-86.1% compared to 2020), amounting to 83 million euro. This decrease is due to the decrease of the incoming travel traffic by 85.2%, as well as to the reduction of the average expenditure per trip by 5.6%. Despite this, the government cabinet seems to be quite optimistic and invested in a recovery of tourism in 2021, due to an increase in travel of about 50%. In the same context are also the two scenarios recently published by Eurobank for Greek tourism. The first scenario, called "conservative", estimates that travel receipts will amount to 40.3% of 2019 revenues, while the latter, characterized as "more aggressive", estimates 55.7%.

As for its current estimates for the GDP in 2021, according to the spring forecasts of the European Commission, the Greek economy is expected to grow by 4.1%. In the same way, the forecasts of the Ministry of Finance estimate a growth of 3.6% for this year.[3]

In this article, we (a) explore the multiplier effects that will have for 2021 the change of both the components of autonomous demand (government consumption expenditure, investment, exports) and, separately, the travel receipts to GDP, employment and imports of the Greek economy and (b) compare these two different results.[4] Our analytical framework bases on the concept of the Sraffian multiplier; using data from the Supply and Use Tables to capture the structure of the Greek economy (for details see Rodousakis and Soklis 2020 and Mariolis et al., 2020 and 2021). The changes to the components of final demand are based on the projections of the European Commision and the Greek Ministry of Finance, respectively. Finally, we adopt the official government opinion that the travel receipts in 2021 will be equal to 50% of the receipts of 2019, i.e., an increase of 4.54 billion euro.

1.4.2. Multiplier effects on the Greek economy

Using data from ELSTAT, we estimate the multiplier effects of the increase in government spending, investments, exports and international travel receipts on GDP, employment and imports of the Greek economy. These effects are shown in Table 1.4.1, which shows for every 1 billion euro increase (decrease) in the components of autonomous demand and travel receipts the corresponding increase (decrease) in billion euro in GDP and imports, while in terms of employment,

1. This was due to the extraordinary measures taken by the government to support the workers who were out of work because of the pandemic. The exact size of unemployment is not feasibly reflected in elements of ELSTAT; for this issue, see Papadimitriou et al., 2020.

2. Private consumption decreased by 5.2%, gross fixed capital formation remained virtually stagnant, and public consumption increased by 2.7%.

3. For a complete picture of the possible GDP growth of the Greek economy, see also Papadimitriou et al. (2021).

4. It should be noted that neither scenario distinguishes between exports of goods and exports of services.

TABLE 1.4.1 Multiplier effects

	GDP	Employment	Imports
Investments	0.68	18.93	0.60
Government	1.48	33.52	0.35
Exports	0.78	16.60	0.50
Tourism	1.07	26.40	0.32

Source: Mariolis et al. (2021).

this increase (decrease) corresponds to thousands of people.

1.4.3. Impact on GDP, employment and total imports

According to the European Commission's Spring 2021 forecast for the changes in the elements of autonomous demand of the Greek economy in 2021, the government's final consumption is expected to increase by approximately 0.786 billion euro, gross fixed capital formation is expected to increase by approximately 3.060 billion euro, and exports are expected to increase by approximately 4.992 billion euro. Therefore, using Table 1.4.1, we estimate that the European Commission's projections correspond to a total (direct and indirect)

- increase in GDP by around 4.26%;
- increase in the levels of total employment of about 4.44%;
- increase in total imports by about 7.03%.

According to Ministry of Finance (MinFin) projections for the changes in the elements of autonomous demands of the Greek economy in 2021, the government's final consumption is expected to increase by approximately 0.536 billion euro, gross fixed capital formation is expected to increase by approximately 1.662 billion euro, and exports are expected to increase by approximately 5.705 billion euro. Our estimations suggest that MinFin projections correspond to a total (direct and indirect)

- increase in GDP of about 3.80%;
- increase in the levels of total employment of about 3.83%;
- increase in total imports by about 6.16%.

In Tables 1.4.2–1.4.4, we present in detail the multiplier effects of the components of autonomous demand for both scenarios.

Finally, the analysis of the multiplier effects of the country's travel receipts shows that if the receipts of 2021 reach 50% of the receipts in 2019, this, *ceteris paribus,* will cause an

- increase in the country's GDP by about 2.9%;

TABLE 1.4.2 Multiplier effects of the elements of autonomous demand on GDP (%)

	Ministry of Finance	European Commission
Total	**3.80%**	**4.26%**
Investments	0.67%	1.24%
Government	0.47%	0.69%
Exports	2.66%	2.32%

TABLE 1.4.3 Multiplier effects of autonomous demand elements on employment (%)

	Ministry of Finance	European Commission
Total	**3.83%**	**4.45%**
Investments	0.84%	1.54%
State expenses	0.48%	0.70%
Exports	2.52%	2.20%

TABLE 1.4.4 Multiplier effects of autonomous demand elements on total imports (%)

	Ministry of Finance	European Commission
Total	**6.17%**	**7.04%**
Investments	1.52%	2.80%
State expenses	0.29%	0.42%
Exports	4.35%	3.81%

- increase in employment in the economy by about 3.19%;
- increase in total imports by about 2.21%.

Our estimates show, based on both scenarios, that most of the growth of the economy is expected to be caused by the positive effects of export growth, followed by the positive effects of fixed capital formation and by the small increase in government spending. Also, our estimates seem to be in line with the forecasts of both the Ministry of Finance and the European Commission: Based on the scenario of the European Commission, we estimate growth of 4.26% versus 4.1% of the Commission, while based on the scenario of the European Commission, we estimate growth of 3.8% versus 3.6% of the Ministry. In comparison to our estimates, there is an overestimation of the range of increase in employment and the exports of goods and services.

Regarding the scenario that, *ceteris paribus,* tourism revenues will be around 50% of 2019, the analysis shows an increase in GDP of 2.89%. Compared to the two scenarios mentioned above, this result can be considered, at first, as impressive, but it has perfectly logical explanations, which are the following:

1. GDP in 2020 dropped to 165.8 billion euro from 183.4 billion euro in 2019.
2. For travel receipts, reference is made to a size corresponding to 2019. Thus, 50% of receipts in 2019 is equivalent to an almost 100% increase in receipts in 2021 compared to 2020.
3. The multiplier of tourism is above the average of the economy and, in fact, much higher than the multiplier of investment and the multiplier of exports (the latter includes goods not only services).
4. Public expenditure, which has quite a high multiplier footprint not only in relation to the average of the economy, but also in relation to tourism, on the basis of both scenarios, is almost stagnant in 2021.
5. According to a study by KEPE on behalf of the Ministry of Finance, the impact of funding from the National Plan for Recovery and Sustainability (ESAA) on GDP for 2021 will be of the order of 0.30%.[5]

Finally, it is worth noting that, often, to find the total (direct and indirect) impact of tourism on GDP, a tourism multiplier of 2.5 is used. This leads to a total (direct and indirect) contribution of tourism to GDP of about 30%. It is rather obvious that estimates for the contribution of tourism to GDP of 30% are incorrect, as this would mean the recession of the Greek economy in 2020 would be at least 20%. On the contrary, combining the above framework of multiplier effects with national concepts that reflect the specific weight of the tourism sector in the economy, we recently estimated that the total multiplier effect of the tourism sector in the Greek economy is around 12% of GDP, while the share of tourism in GDP is in the range of 6%-7.2% (Rodousakis and Soklis, 2021).

1.4.4. Conclusions

The analysis of the multiplier effects in the Greek economy for 2021 shows that based on the assumptions of the scenarios of the Ministry of Finance and the European Commission for autonomous demand, we estimate a GDP growth of 3.8% and 4.26%, an increase of employment of 3.83% and 4.45%, and an increase of total imports of 6.17% and 7.04%, respectively. Further, based on the hypothesis that tourism revenues will hover at 50% of 2019, we estimate one *ceteris paribus* increase in GDP of 2.9%, in employment of 3.19%, and in total imports of 2.21%. The above results show that tourism can be the "pillar" of development for 2021, and it seems that the relevant government planning for 2021 is based on this fact.

However, this fact is temporary and deals with the special conditions that prevail in the Greek and international economies due to the pandemic of COVID-19. Tourism, due to its specific characteristics, has long proven that it cannot play the role of the "locomotive"

5. For the period 2021-2026, KEPE estimates that the ESAA will contribute to growth cumulatively by 7.2%.

of the Greek economy (Rodousakis and Soklis, 2021). Indicatively, it is sufficient just to consider that in the period 2008-2019, travel receipts rose by about 56.2% and, at the same time, the nominal GDP reduced by about 24.2%.

Therefore, given that the positive effects of the National Plan for GDP Recovery and Resilience will begin to emerge from 2022 onwards, the other components of autonomous demand, other than exports, do not appear to be able to support GDP growth above 2% for 2021. Increasing tourism revenues by 4.54 billion euro is the only way for the Greek economy to receive the short-term growth stimulus that it so desperately needs.

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1.5. Positive messages and challenges for the Greek stock market

Fotini Economou

1.5.1. Introduction

The outbreak of the health crisis in 2020 created unprecedented conditions of uncertainty, both for the international and the domestic market, which were maintained due to the peak of the third wave of the pandemic, with negative social and economic consequences. Nevertheless, the Greek stock market completed the first four months of 2021 with positive returns for all stock indices.

At the same time, the successful government bond issues, with the raising of funds at particularly low borrowing costs (at historically low levels), confirmed the market's confidence in the Greek economy. In addition, the first four months of the year ended with another very positive development for the Greek economy and market as, on April 23, 2021, the international rating agency S&P Global Ratings upgraded Greece's credit rating from BB- to BB, while also improving the country's outlook from "stable" to "positive". This is the second upgrade, after the upgrade of the Greek economy by the international rating agency Moody's in November 2020 from B1 to Ba3 with a stable outlook, which is observed during the health crisis and the unprecedented conditions of uncertainty that it entails. This development is particularly positive, as, according to S&P Global Ratings,[1] the upgrading of the Greek economy reflects their "expectation of a rapid improvement in Greece's economic and budgetary performance as the adverse impacts of the COVID-19 pandemic subside", while emphasis is also given to the governance effectiveness.

This article presents the course of the Greek stock market since the beginning of 2021 with emphasis on key stock market indices and data. Moreover, having completed more than a year of the pandemic, the available stock market data allow the empirical investigation of the impact of the pandemic on the returns of the stock market. Finally, the last section of the article summarizes and concludes.

1.5.2. The course of the stock market for the first four months of 2021

After a year of intense uncertainty due to the pandemic and its socio-economic impact, the first four months of 2021 ended with a positive sign, with all the stock indices of the Athens Stock Exchange (ATHEX) recording positive returns.

More specifically, according to ATHEX data (Table 1.5.1), the Athex Composite Share Price Index increased by 12.53%, reaching 910.37 points at the end of April 2021 from 808.99 units at the end of December 2020. The course of the FTSE/Athex Large Cap Index was similar, recording an increase of 14.37%, while the FTSE/Athex Mid Cap Index also increased by 21.16%. The course of the sector indices was also positive. The three sector indices that recorded the highest returns were FTSE/Athex Basic Resources, FTSE/Athex Industrial Goods & Services, and FTSE/Athex Construction & Materials, with returns of 34.38%, 28.28%, and 19.88%, respectively. FTSE/Athex Banks followed with a return of 18.44%. The lowest returns were recorded by FTSE/Athex Financial Services and FTSE/ATHEX Real Estate at 4.56%, and 4.52%, respectively.

According to ATHEX (2021)[2] data, the total value of Assets Under Custody held by domestic and foreign investors (in total listed equities) reached €52.72 billion at the end of April 2021 (including the participation of the Hellenic Financial Stability Fund), increased by 8.6% compared to the end of the previous month. The participation of foreign investors was 62.2% and the participation of domestic investors was 37.8%. Domestic investors recorded inflows of €24.4 million in April 2021 and total inflows of €94 million since the beginning of the year, while foreign investors recorded outflows of €24.4 million in April 2021 and total outflows of €94 million since the beginning of the year. Note that foreign investors made 51.8% of transactions

1. See S&P Global Ratings, "Research Update: Greece Upgraded To 'BB' On Improved Governance Effectiveness; Outlook Positive", April 23, 2021.

2. Note that in May 2021, the revised AXIAnumbers disposal began in the new environment of Hellenic Central Securities Depository SA (ATHEXCSD) according to Regulation CSDR and Law 4569/2018.

TABLE 1.5.1 Prices and returns for selected indices of the ATHEX (31/12/2020-29/4/2021)

	29/4/2021	31/12/2020	Year min	Year max	Year change (%)
FTSE/Athex Mid Cap Index	1,341.74	1,107.38	1,026.21	1,357.56	21.16%
FTSE/Athex Large Cap	2,212.69	1,934.64	1,718.82	2,234.40	14.37%
Hellenic Mid & Small Cap Index	1,369.95	1,202.50	1,110.37	1,392.77	13.93%
Athex Composite Share Price Index	910.37	808.99	726.02	919.21	12.53%
Athex All Share Index	210.51	187.55	175.88	211.18	12.24%
FTSE/ATHEX Mid & Small Cap Factor-Weighted Index	3,412.16	3,124.15	2,996.13	3,462.31	9.22%
FTSE/Athex Basic Resources	8,269.73	6,153.83	5,233.31	8,544.50	34.38%
FTSE/Athex Industrial Goods & Services	3,762.32	2,932.95	2,762.19	3,819.60	28.28%
FTSE/Athex Construction & Materials	3,310.09	2,761.06	2,565.75	3,310.09	19.88%
FTSE/Athex Banks	614.67	518.99	405.46	621.79	18.44%
FTSE/Athex Travel & Leisure	2,002.81	1,732.48	1,540.34	2,009.99	15.60%
FTSE/Athex Retail	56.69	49.57	46.54	58.49	14.36%
FTSE/Athex Technology	1,245.44	1,092.34	1,043.00	1,248.65	14.02%
FTSE/Athex Utilities	5,213.40	4,602.67	4,264.97	5,372.86	13.27%
FTSE/Athex Insurance	2,120.69	1,909.42	1,909.42	2,192.44	11.06%
FTSE/Athex Health Care	489.84	443.19	396.54	503.84	10.53%
FTSE/Athex Food & Beverage	10,862.44	9,885.18	9,045.03	10,966.04	9.89%
FTSE/Athex Consumer Goods & Services	8,533.79	7,781.92	6,939.31	9,231.17	9.66%
FTSE/Athex Energy	3,217.20	2,964.77	2,835.10	3,417.93	8.51%
FTSE/Athex Telecommunications	3,931.25	3,644.51	3,294.37	4,054.79	7.87%
FTSE/Athex Financial Services	798.77	763.95	679.98	832.38	4.56%
FTSE/ATHEX Real Estate	5,043.36	4,825.18	4,187.35	5,277.93	4.52%

Source: Daily official list of trading activity of the ATHEX (29/4/2021 and 31/12/2020).

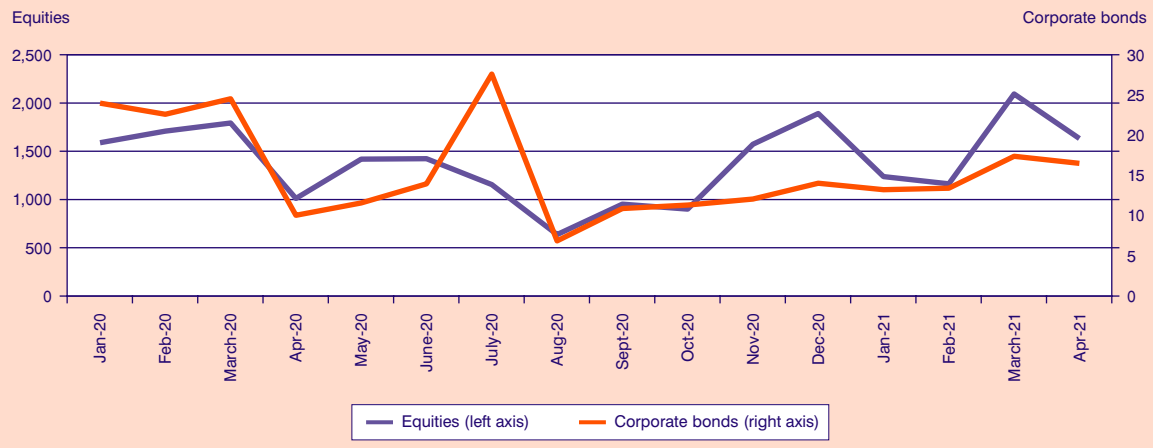
in April 2021, from 57.5% in the previous month. Moreover, domestic retail investors made 24.1% of transactions in April 2021, from 21.8% in the previous month.

The course of the value of equity transactions on the ATHEX is also interesting (see Figure 1.5.1). The cash value of settled transactions of equities for the first four months of 2021 reached €6.13 billion, close to the levels of the first four months of 2020 at €6.10 billion. According to April 2021 data, the cash value of settled transactions of equities decreased to €1.63 billion from €2.09 billion in the previous month, even though it recorded an increase compared to April 2020, which was at €1.01 billion.

Moreover, the course of the corporate bond indices was also positive, with the Hellenic Corporate Bond Price Index[3] recording a return of 1.86% and the Hel-

3. Based on the net price of each bond.

FIGURE 1.5.1
Cash value of settled transactions, January 2020-April 2021 (in million €)



Source: Athens Exchange Group, Monthly Statistics Bulletin AxiaNumbers, Securities Market, December 2020 and April 2021.

lenic Corporate Bond Index[4] a return of 2.91%.[5] Note that during the first four months of 2021, the cash value of settled transactions of corporate bonds decreased to €60.52 million from €81.16 million during the first four months of 2020, even though the cash value of settled transactions of corporate bonds was at €16.50 million in April 2021, i.e., higher compared to April 2020 when it was at €10.04 million (Figure 1.5.1).

Finally, improvement was also recorded in April 2021 in the KEPE GRIV implied volatility index, i.e., the so-called "fear" index. The KEPE GRIV index reflects the uncertainty of the derivatives market participants about the expected short-term course of the Greek market and is calculated on the basis of the FTSE/ATHEX Large Cap options prices. The KEPE GRIV index decreased in April 2021, reaching 22.82% on 29/4/2021 from 25.97% on 31/3/2021, and 23.97% at the end of December 2020. The index remained below its historical average level (since January 2004) for the Greek market, which stands at 32.90%, while the average daily value of the index decreased in April, reaching 24.00% from 25.35% in March 2021. The evolution of the index during the period under examination reflects a decrease in uncertainty for the expected short-run course of the Greek market.

1.5.3. The impact of the pandemic on the stock market: findings for the ATHEX

Having completed more than a year of the health crisis that began with the outbreak of the COVID-19 pandemic in Greece, the availability of stock market data makes it possible to examine the impact of the pandemic on the stock market. This current issue is of particular interest to international research that empirically documents the negative impact of the pandemic on international stock markets, with increased risk and significant losses for investors in the short term (Zhang et al., 2020). In addition, empirical findings confirm the negative impact of total domestic confirmed COVID-19 cases on the respective stock markets (Al-Awadhi et al., 2020; Ashraf, 2020; Cao et al., 2020).

In this article, we investigate the impact of the pandemic on the ATHEX using weekly[6] (percentage) returns of the Athex Composite Share Price Index and the weekly (percentage) change of the total con-

4. Based on the net price, accrued interest and the value of the payments of each bond.

5. Returns on 27/4/2021 according to the daily official list of trading activity of the ATHEX of 29/4/2021.

6. The use of daily observations implies the loss of Covid-19 case observations recorded on non-working days. For this reason, in the present analysis, weekly observations (changes) were preferred, given the availability of a sufficient number of observations. To test the robustness of the findings, the analysis was also performed using daily observations and the results did not differ qualitatively.

firmed COVID-19 cases in Greece from March 2020 to April 2021. This variable is used in the international literature to examine the impact of COVID-19 on the stock market (see, for example, Al-Awadhi et al., 2020, and Ashraf, 2020). The data for the Athex Composite Share Price Index were derived from investing.com and COVID-19 cases data as recorded by Johns Hopkins University.[7]

The least squares method was used to estimate the following equation (with robust standard errors):

$$Athex\ Composite\ Share\ Price\ Index\ Return(\%)_t = \\ = \alpha + \beta\ \Delta Total\ COVID\text{-}19\ cases(\%)_{t-1} + \varepsilon_t \qquad (1)$$

where we examine the effect of the percentage weekly change of the total COVID-19 cases of the previous week in Greece on the percentage weekly return of the Athex Composite Share Price Index during the current week; t is the time and ε_t is a random error term.

According to the estimation of equation (1), there is a negative and statistically significant relationship (coefficient β is equal to -0.0174). Considering the long-term stability of this relationship and taking into account the importance of vaccination for the course of the pandemic and the prospect of exiting it, equation (1) is re-estimated before and after the first vaccine marketing authorization in the EU for the BioNTech and Pfizer[8] vaccine on December 21, 2020 (with the first vaccinations to follow within a few days in Greece). By examining the two subperiods of the sample, the observed negative relationship is located in the period before the authorisation of the vaccine, with a β coefficient of similar size (coefficient β equals to -0.0178) and statistically significant, while in the second subperiod there is no statistically significant relationship. It seems, therefore, from the empirical findings, that after the announcement of the vaccine authorisation and the subsequent beginning of the vaccinations, the negative impact of the COVID-19 cases in the course of the Athex Composite Share Price Index is no longer confirmed, despite their high number during the third wave of the pandemic in Greece.

1.5.4. Conclusions

After an unusual stock market year, which was characterized by increased uncertainty, the year 2021 started with positive stock returns for the first four months. More specifically, all stock market indices recorded positive returns, with FTSE/Athex Basic Resources and FTSE/Athex Industrial Goods & Services indices standing out, while the banking sector was in fourth place in the performance of industry indices. Moreover, the total value of Assets Under Custody held by domestic and foreign investors increased and the course of the KEPE GRIV index reflected a decrease in uncertainty for the expected short-run course of the Greek market, based on April 2021 estimations.

At the same time, there are still positive signs coming from the government bond market with the raising of funds at low borrowing costs. Note that €3 billion were raised at a historically low borrowing cost (zero coupon and re-offer yield of 0.172%) from the successful issuance of the 5-year government bond in early May 2021, while the yields on the recent issues of the Greek Government Treasury bills of 13, 26 and 52 weeks remained negative, with the yield of the recent 13-week Greek Government Treasury bill in early May 2021 at a historically low borrowing cost of -0.40%. These issuances followed Greece's credit rating upgrade by the international rating agency S&P Global Ratings in April 2021.

The examination of the pandemic period, from March 2020 to April 2021, empirically confirms the negative effect of the pandemic on the Athex Composite Share Price Index returns for the period under examination, with the negative effect of the weekly change of total COVID-19 cases being detected in the period before the authorisation and the beginning of the vaccination. Note that the stock market is simultaneously affected by several factors, which could be considered in a more detailed future analysis, which is beyond the scope of this short article.

Finally, according to data provided in the Annual Report of the Hellenic Capital Market Commission for 2020, the total capital raised from equity issues amounted to €102.34 million in 2020, significantly reduced compared to €976.18 million in 2019, and the capital raised from the issuance of bonds amounted to €1.02 billion from €525 million in 2019. More than ever, the capital market should promote economic growth by facilitating financing and contributing to the utilization of the resources of the Recovery and Resilience Fund.

7. Source of the data: COVID-19 Data Repository by the Center for Systems Science and Engineering (CSSE), Johns Hopkins University, available at <https://github.com/CSSEGISandData/COVID-19>. See Dong et al. (2020).

8. Conditional marketing authorisation for the COVID-19 vaccine developed by BioNTech and Pfizer. See Press Release of the European Commission <https://ec.europa.eu/commission/presscorner/detail/el/ip_20_2466>.

Overall, there are positive messages from the markets, based on the analysis of the data of the first four months of 2021. However, the challenges posed by the health crisis remain, as its overall impact on the real economy will depend, among other things, on the course of vaccinations in the effort to mitigate the pandemic and return to "normality".

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

Aristotelis Koutroulis

The global economy showed great resilience in the face of the 2020 crisis. This has created expectations for a stronger economic recovery and a faster return of economic activity to normalcy. Still, the global economy remains vulnerable to the future dynamics of the pandemic. In a globalized economic environment where economic strength is asymmetrically distributed among states, there is room for more international solidarity and closer economic policy coordination.

1.6.1. Trends and developments in the global economy

After a difficult year for most nations, the world seems to be entering a phase of the gradual restoration of normalcy. On the public health front, significant progress regarding the discovery, production and distribution of vaccines against Covid-19, along with mass vaccinations of populations in several geographical regions, indicate that the way out of the pandemic is closer. Things are looking better on the economic front as well.

According to recent revisions made by international organizations to growth estimates, the decline in global GDP over the past year is expected to be much smaller than originally projected, with the rate of decline in global GDP hovering around -3.5% (see Table 1.6.1) (EC, 2021; IMF, 2021; OECD 2021b; and UN, 2021a). The improved estimates mainly reflect the unprecedented policy responses around the world. In fact, it is estimated that without the combined effects of automatic stabilizers, expansionary fiscal and monetary policy and the emergency measures to support the financial sector, the contraction of world GDP in 2020 could have been three times larger (IMF, 2021).

In 2021, the annual growth rate of global GDP is projected to range from 5.4 to 6 percentage points (see Table 1.6.1). Global economic activity is expected to benefit from the fast reopening of the world's two largest economies, namely, China and the US, and the strong rebound of manufacturing activity. On the demand side, spending on digital equipment related to teleworking and distance education as well as spending on durable goods –mainly passenger cars– are among the key drivers of the global economic recovery. As for economic policy, public support in the form of fiscal and monetary stimulus will remain vital for most economies (EC, 2021; IMF, 2021 OECD 2021b and UN, 2021a).

Comparing last January's growth forecasts with the recently revised ones paints a clearly improved picture of the global economy. However, a simple overview of key macroeconomic figures at a national level reveals significant differences across countries. Regarding last year's recession, the data show that economies with disproportionately high dependence on tourism or exports of raw materials were the recorded the largest losses in terms of domestic production (IMF, 2021; OECD 2021; and UN, 2021a). On the contrary, economies whose production structure is characterized by the presence of a robust manufacturing industry experienced a milder economic crisis. At the same time, these economies are expected to achieve faster recovery rates in 2021 (UN, 2021a).

1.6.2. Inflation and Unemployment

Since the beginning of the year, inflation in developed economies has been following an upward trend. Emerging inflationary pressures reflect, to a large extent, temporary supply shortfalls in the oil market, the base metals market, the production of semiconductor materials and international shipping (OECD, 2021a; UN, 2021b).

According to IMF analysts, the rise in inflation marks a return to its long-term trend without inspiring much concern. This position reflects the modest increases in wages and the reduced bargaining power of workers in an environment of high productivity gaps, high unemployment and high rates of underemployment (IMF, 2021). Given that most central banks across the globe are determined to react against stronger inflationary pressures, the average annual inflation in advanced and developing economies is not expected to exceed 1.6% and 4.9%, respectively (see Table 1.6.2).

TABLE1 1.6.1 Real Gross Domestic Product[1,2]

(annual percentage changes)

	2019*				2020*				2021**				2022**			
	IMF	EC	OECD	UN	IMF	EC	OECD	UN	IMF	EC	OECD	UN	IMF	EC	OECD	UN
World economy	2.8	2.7	2.7	2.5	-3.3	-3.4	-3.5	-3.6	6	5.6	5.8	5.4	4.4	4.3	4.4	4.1
Advanced economies	1.6	1.7	:	1.7	-4.7	-4.3	:	-5	5.1	5	:	5	3.6	3.9	:	3.4
USA	2.2	2.2	2.2	2.2	-3.5	-3.5	-3.5	-3.5	6.4	6.3	6.9	6.2	3.5	3.8	3.6	3.2
Euro Area	1.3	1.3	1.3	1.3	-6.6	-6.6	-6.7	-6.9	4.4	4.3	4.3	4.2	3.8	4.4	4.4	3.9
Japan	0.3	0.3	0	0.3	-4.8	-4.8	-4.7	-4.8	3.3	3.1	2.6	3.3	2.5	2.5	2	2.2
United Kingdom	1.4	1.4	1.4	1.3	-9.9	-9.8	-9.8	-9.9	5.3	5	7.2	5.1	5.1	5.3	5.5	5.5
Developing economies	3.6	3.5	:	3.6	-2.2	-2.5	:	-1.7	6.7	6.2	:	6.1	5	4.5	:	5
Brazil	1.4	1.4	1.4	1.4	-4.1	-4.1	-4.1	-4.1	3.7	3.4	3.7	3	2.6	1.8	2.5	2.4
Russia	2	1.3	:	1.3	-3.1	-3	-3.6	-3	3.8	2.7	2.7	3	3.8	2.3	2.6	3
India	1	4.8	4	4.6	-8	-6.9	-7.7	-6.8	12.5	10.5	9.9	7.5	6.9	6.5	8.2	10.1
China	5.8	6	6	6.1	2.3	2.3	2.3	2.3	8.4	7.9	8.5	8.2	5.6	5.4	5.8	5.8

Sources: IMF, *World Economic Outlook,* April 2021; OECD, *OECD Economic Outlook,* (Vol. 2021/1: Preliminary version); European Commission, *European Economic Forecast, Spring 2021;* United Nations, *Word Economic Situation and Prospects as of mid-2021.*

* 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 1.6.2 Inflation[1]

(annual percentage changes)

	2020*			2021*			2022*		
	IMF	EC	OECD	IMF	EC	OECD	IMF	EC	OECD
Advanced economies	0	:	:	1.6	:	:	1.7	:	:
USA	1.2	1.2	1.2	2.3	2.2	3	2.4	2	2.4
Euro Area	0.3	0.3	0.3	1.4	1.7	1.8	1.2	1.3	1.3
Japan	0	0	0	0.1	0.3	0.1	0.7	0.9	0.6
United Kingdom	0.9	0.9	0.9	1.5	1.6	1.3	1.9	1.8	1.7
Developing economies	5.1	:	:	4.9	:	:	4.4	:	:
Brazil	3.2	:	4.8	4.6	:	4.9	4	:	4
Russia	3.4	3.5	:	4.5	4.7	:	3.4	4.3	:
India	6.2	:	6.5	4.9	:	5.4	4.1	:	4.8
China	2.4	2.5	2.5	1.2	:	1.5	1.9	:	2.4

Sources: IMF, *World Economic Outlook,* April 2021; OECD, *OECD Economic Outlook,* (Vol. 2021/1: Preliminary version); European Commission, *European Economic Forecast, Spring 2021.*

* Projections.

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

TABLE 1.6.3 Annual unemployment rates

	2019			2020*			2021**			2022**		
	IMF	EC	OECD	IMF	EC	OECD	IMF	EC	OECD	IMF	EC	OECD
USA	3.7	3.7	3.7	8.1	8.1	8.1	5.8	4.6	5.6	4.2	3.4	4.3
Euro Area	7.6	7.5	7.5	7.9	7.8	7.9	8.7	8.4	8.2	8.5	7.8	7.9
Japan	2.4	2.3	2.8	2.8	3	3	2.8	2.9	3	2.4	2.6	2.9
United Kingdom	3.8	3.8	3.8	4.5	4.4	4.5	6.1	5.6	5.4	6.1	5.9	5.8
Brazil	11.9	:	:	13.2	:	:	14.5	:	:	13.2	:	:
Russia	4.6	:	:	5.8	6	:	5.4	5.7	:	5	5.7	:
China	3.6	:	:	3.8	4.2	:	3.6	:	:	3.6	:	:

Sources: IMF, *World Economic Outlook,* April 2021; OECD, *OECD Economic Outlook,* (Vol. 2021/1: Preliminary version); European Commission, *European Economic Forecast, Spring 2021.*

* Estimations, ** Projections.

Despite the unprecedented emergency measures to support labour markets, unemployment rates have increased considerably. According to the International Labor Organization, total working hours worldwide fell by 8.8 percentage points in 2020, which is equivalent to the loss of 255 million full-time jobs (ILO, 2021; UN, 2021a). Over the same period, the exit of 81 million workers from the labour force led to a reduction in labor force participation rates by 2.2% (ILO, 2021; UN, 2021a). Along with these developments, the total number of people living in extreme poverty increased by 95 million (IMF, 2021).

The workers mostly affected by elevated unemployment, underemployment and low wages are mainly found in the demographic groups of young people, women and low-skilled workers. This asymmetry reflects the disproportionately high share of the three groups in the workforce of the sectors that have been hit harder by the pandemic (accommodation and catering services, entertainment, arts, etc.) (IMF, 2021). Given the social protection gap regarding informal employment, the burden of suffering is worse for workers of the informal sector. The problem is particularly worrisome in regions of Africa, East and South Asia and Latin America where the proportion of informal to total employment exceeds 50% (UN, 2021a).

Throughout 2021, unemployment rates are projected to remain elevated in most regions of the world (see Table 1.6.3 above). This pessimistic projection reflects a combination of factors: the large concentration of the unemployed in sectors and occupations that require direct social contact; the large share of these sectors in total employment (OECD, 2021a); the persistence of social distancing on a voluntary basis; and the permanent loss of jobs either due to the acceleration of automation processes or due to the exit of firms from the market.

1.6.3. Economic developments across the globe

Advanced economies

Fast vaccine deployment along with the gradual lifting of restrictive measures have significantly improved the economic climate in most advanced economies. With expansionary economic policy supporting aggregate demand and household and business confidence on the rise, it is estimated that the average annual GDP growth rate in the advanced world will reach 5% this year (see Table 1.6.1).

Owning to accommodative monetary policy and two significant fiscal packages, the US economy is projected to obtain the highest growth rate since 1966 and take the advanced world's recovery lead in 2021 (UN, 2021a). Along with policy interventions, encouraging messages from rapid vaccination rates and improving labor market conditions have boosted household and business confidence, thereby creating expectations for a faster normalization of economic activity than foreseen (IMF, 2021; UN, 2021a).

Compared to the US, economic recovery rates in the Eurozone and Japan are set to be milder (see Table 1.6.1). According to the IMF, this diversification reflects differences between the three economies regarding (a) the response of national health authorities to the pandemic, (b) the attitude of the population towards public health threats, (c) the degree of adaptability of economic agents to pandemic life, and (d) pre-pandemic trends and structural weaknesses (IMF, 2021).

The Eurozone's economic recovery is linked to increased private consumption, expansionary fiscal policy and rising external demand, mainly from the US. On the supply side, manufacturing has proved remarkably resilient with output picking up in most manufacturing subsectors. In contrast, service activities requiring close proximity between consumers and producers are expected to experience a gradual recovery during the second half of 2021. As for Japan, economic activity is expected to recover at a moderate pace this year on the back of public spending and manufacturing exports (OECD, 2021b).

Emerging and developing economies

The observed discrepancy between government procurement of vaccines and demographic data in many developing countries has raised concerns about the prospects of the vaccination process (IMF, 2021). Equally worrying is the spread of coronavirus variants in India and other regions of developing world. In turn, heightened uncertainty regarding public health may slow down economic recovery and add pressures for additional policy support in countries that have already exhausted their public finances (OECD, 2021b). Nevertheless, the average annual rate of GDP growth in emerging and developing economies is projected to be around 6%. This projection reflects the positive outlook of commodity-producing economies and China's strong rebound.

Thanks to the effective control of the pandemic, the sizable economic policy support, and the fast recovery of the manufacturing sector, China managed to be the only large economy that registered positive growth rates in 2020. As Chinese manufacturing is gaining

momentum, it is expected to lead the economic recovery of the country and simultaneously boost economic activity in China's supply-chain partners. In India, last spring's adverse developments on the epidemiological side are expected to exert only a temporary negative impact without derailing the country from its recovery path. As for the other two major emerging economies, Russia and Brazil, they are expected to benefit from rising international demand for the commodities they produce and export.

1.6.4. World trade and commodity prices

The progress in vaccine deployment in combination with the reopening of the national borders, the rising demand for consumption and capital goods and the gradual restoration of normality in global supply chains have improved the prospects of international trade. According to the IMF, the total volume of international trade (goods and services) is expected to increase by 8.4% in 2021 (see Table 1.6.4). So far, merchandise trade remains the key driver of global trade. In contrast to merchandise trade, which has already returned to 2019 levels, the volume of cross-border trade in services (tourism, international travel) shrank by 85% in the first quarter of 2021 (UN, 2021a). This asymmetry between goods and services is projected to dim only gradually over the next months and only after a sufficient number of countries have managed to bring the pandemic under control.

Commodity prices are expected to follow an upward trend in 2021. More specifically, temporary 'bottlenecks' in international crude oil markets are estimated to drive the average international oil price from $41.29 per barrel in 2020 to $58.58 in 2021 (IMF, 2021). Basic industrial metal prices are also set to rise due to the strong manufacturing recovery in China and many advanced economies. As for the prices of precious metals, they will move upwards as a result of the extremely loose monetary policy and the low interest rates. Finally, increased demand for food commodities, either for immediate consumption or storage, in combination with low harvests due to adverse weather conditions, is expected to add some pressure on food commodity prices.

1.6.5. Downside risks and international policy coordination

The gradual deceleration of Covid-19 spreading across advanced economies in combination with the strong rebound of the world's two largest economies –China and the US– have led analysts to take a more optimistic view about global growth prospects. On the other hand, available data on the daily number of new reported cases and new mutations in the rest of the world suggest that the pandemic is far from over for many developing countries (UN, 2021a). At the same time, the downside risks surrounding global economic recovery remain high. These are related to (a) a longer-

TABLE 1.6.4 World trade volume[1]
(annual percent changes, goods and services)

	2019*	2020*	2021**	2022**
World trade volume (goods and services)	0.9	-8.5	8.4	6.5
Imports				
Advanced economies	1.7	-9.1	9.1	6.4
Developing economies	-1	-8.6	9	7.4
Exports				
Advanced economies	1.3	-9.5	7.9	6.4
Developing economies	0.5	-5.7	7.6	6

Source: IMF, *World Economic Outlook Update,* April 2021.

* Estimations, ** Projections.

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

term impact of the crisis on the economies' productive capacities, (b) tighter financing conditions, (c) increasing protectionism of domestic producers against foreign competition, (d) escalating social tensions, and (e) adverse weather conditions due to global warming.

By prolonging uncertainty, these risks could make households and firms excessively cautious when consuming and investing, respectively, thereby leading to a softer than projected economic recovery. The problem is particularly worrisome in financially constrained developing countries that cannot continue to support their economies through expansionary economic policies. To address this problem and secure the recovery of financially weaker countries, the global community needs to ensure that international coordination on economic policy is maintained.

Although the issue of international solidarity and cooperation has received special attention from policy makers across the globe, little progress has been made in practice. Perhaps the best way to illustrate poor international coordination is to consider the distribution of available vaccines across countries: As of last April, 50% of the global stock of vaccines against Covid-19 had been acquired, through pre-purchases, from rich economies that host 16% of the world population (IMF, 2021). Obviously, the manifestation of such 'ethnocentric' behaviors on the epidemiological side is not in line with the spirit of international solidarity and cooperation that our times demand.

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2. Fiscal developments

KEPE, *Greek Economic Outlook,* issue 45, 2021, pp. 37-42

State Budget, public debt, and fiscal figures perspectives

Elisavet I. Nitsi

2.1. State Budget execution, January-May 2021

According to the most recent data retrieved from the General Accounting Office,[1] on a modified base, the execution of the State Budget in the period January-May 2021 is significantly deficient compared to the corresponding period of 2020, but it is less deficient compared to the monthly estimates, as they were reflected in the executive summary of the State Budget for the fiscal year 2021. The deficit was expected, as there was a necessity for higher expenditures to cover the needs resulting from the Covid-19 pandemic.

According to the data shown in Table 2.1.1, the State Budget had a deficit in its balance amounting to 10.8 billion euros in the period January-May 2021, against a deficit of 7.5 billion euros in the corresponding period of 2020, and a target for deficit of 938 billion euros. The State Budget Primary Balance, also deficient, stood to 8.2 billion euros in comparison to the primary deficit of 4.8 billion euros for the same period in 2020 and the primary deficit target of 7.2 billion euros.

Net revenues of the State Budget amounted to 18.3 billion euros, showing an increase compared to the revenues of the corresponding period in 2020 of 2.3 billion euros or 14.1%, and a decrease of 259 million euros or 1.4% against the targets set by the 2021 Budget. Public Investment Program (PIP) revenues reached 1.3 billion euros, around the same level compared to the corresponding period of 2020 (49 million euros or 3.8% more), but less than the budget target by 594 million euros or 30.7%. More specifically, the rise in revenue compared to the same period last year is mainly due to tax collection (1.5 billion euros), transfers (311 million euros) and other current revenues (304 million euros). On the contrary, the decrease in revenues in relation to the targets set came from transfers that were below the target by 148 million euros and reduced tax collection by 132 million euros, while, at the same time, there were no budgeted sales of fixed assets of 143 million euros. This decrease was partially offset by a significant increase in other current revenues of 295 million euros.

On the expenditure side, which amounted to 29.1 billion euros, the State Budget in the January-May 2021 period increased by 5.6 billion euros or 23.8% compared to the corresponding period of 2020, while in comparison with the target set at 28.3 billion euros, it increased by 801 million euros or 2.8%. The main reasons for this expansion compared to the same period last year are the significant increase in transfers due to pandemic measures, by 3.9 billion euros or 33.9%, and spending on armaments programs of the Ministry of Defense (acquisition of fixed assets), by 1.2 billion euros, an expenditure for which only 557 million euros had been budgeted, while in the corresponding period of 2020 only 56 million euros had been spent. In addition, it should be noted that a significant part of the appropriations to be transferred to the category of transfers within the period January-May were ultimately not transferred. Moreover, the PIP expenditures, amounting to 3.6 billion euros, increased by only 199 million euros or 5.9% compared to the same period last year and by 1.8 billion euros or 104.5% compared to the target set by the 2021 Budget. Finally, in the 2021 Budget, for the first time, 2.6 billion euros have been budgeted from the Recovery and Resilience Fund, of which 329 million euros were expected in May, a fund that ultimately had not been absorbed.

Overall, the implementation of the Budget in the first five months of 2021 shows a relatively small deviation from the targets set by the Ministry of Finance Budget for 2021, as the Covid-19 pandemic lasted longer and led to a prolonged lockdown requiring more than the budgeted funds to address it. The deviation from the corresponding period of 2020 is clearly due to the

1. Based on preliminary data published in the State Budget Execution Monthly Bulletin: May 2021, General Accounting Office, June 2021.

TABLE 2.1.1 State Budget Execution, January-May 2021(mill. €)

	Jan-May 2020	Jan-May 2021		2020	2021
	Outcome	Outcome	Budget estimates 2021[1]	Outcome[2]	Budget 2021[3]
State Budget					
Net revenue	**16,029**	**18,290**	**18,549**	**47,364**	**52,970**
Taxes	15,471	16,920	17,052	43,198	48,652
Social contributions	22	23	23	54	54
Transfers	1,590	1,901	2,049	6,537	6,951
Sales of goods & services	168	233	229	507	603
Other current revenue	551	855	560	2,731	1,636
Sales of fixed assets	2	60	303	8	330
Sales of valuables	0	0	0	0	0
Tax refunds	1,775	1,644	1,666	5,672	4,256
Expenditures	**23,523**	**29,118**	**28,317**	**70,169**	**67,811**
Compensation of employees	5,567	5,546	5,575	13,335	13,544
Social benefits	53	117	38	137	199
Transfers	11,446	15,329	13,546	38,751	31,394
Purchases of goods & services	362	462	325	1,618	1,251
Subsidies	25	16	32	248	80
Interest payments (gross basis)	2,652	2,821	2,600	4,774	4,510
Other current expenditures	3	20	54	29	91
Non allocated expenditure	0	0	3,519	0	4,709
Purchase of fixed assets	56	1,249	557	631	2,646
Purchase of valuables	0	0	0	0	0
Public Investment Program (PIP)					
Revenue[4]	1,294	1,343	1,937	5,542	4,192
Expenditures	3,360	3,559	1,740	10,647	6,750
Recovery and Resilience Fund[5]	0	0	329	0	2,635
State Budget Primary Balance	**-4,843**	**-8,167**	**-7,169**	**-18,195**	**-10,331**
State Budget Balance[6,7]	**-7,494**	**-10,828**	**-9,769**	**-22,806**	**-14,841**

Source: General Accounting Office, Greek Ministry of Finance.

Notes:

1. Budget targets, according to the total estimates as depicted in the 2021 Budget introductory report.
2. Total revenue and expenditure outcome is preliminary and will be finalized after the vote of the 2020 annual Budget report (for both revenue and expenditure).
3. Annual estimates as depicted in the executive summary of the 2021 Budget introductory report.
4. Revenues from the Public Investment Program (PIP) fall into the categories of “Transfers” and “Other current revenues”.
5. Revenues of the Recovery and Stability Fund are contained in the category “Transfers”.
6. + surplus, - deficit.
7. Data is presented according to the new economic classification (Presidential Decree 54/2018).

impact of the pandemic, which in that period had not even started to produce economic effects that could be found in the implementation of the budget.

2.2. The evolution of Greek public debt, first quarter 2021

According to the latest data available from the General Accounting Office,[2] in the first quarter of 2021, the Central Government's debt amounted to 380,795.05 million euros, an increase by 6.8 billion (1.8%) compared to the previous quarter, i.e., end of 2020, and 19 billion (5.2%) compared to the corresponding quarter of 2020. In addition, cash deposits decreased by 0.6 billion (3.3%) compared to the end of 2020 and 7.2 billion (28%) compared to the first quarter of 2020.

The observed increase in the last quarter can be attributed mainly to the issuance of bonds and Treasury Bills that took place during the same period. The increased borrowing of the Greek State was used to finance the increased Budget expenditures, such as the measures that have been taken in order to support the health system due to the pandemic, and to help the economy to cope with the recession, a consequence of the pandemic.

The composition of Central Government debt in the first quarter of 2021 is presented in Table 2.2.1. Based on the type of interest rate, fixed versus floating, the Central Government debt, on a percentage basis, amounted to 979.8% and 2.2%, respectively. There is a change in the composition of debt in favor of fixed rates as compared to the previous quarter (96.7% and 3.3%), but

TABLE 2.2.1 Central Government debt[1] (in million €)*

Period	2020Q1	2020Q4	2021Q1
Outstanding Central Government debt	**361,828.74**	**374,005.73**	**380,795.05**
Debt by type of interest rate			
Fixed rate[2]	346,631.93	361,663.54	372,417.56
Floating rate[2,3]	15,196.81	12,342.19	8,377.49
Debt by way of trading			
Tradable	69,109.29	78,541.20	86,440.48
Non-Tradable	292,719.45	295,464.53	294,354.57
Debt by currency			
Eurozone	357,848.62	369,891.67	380,033.46
Non-Eurozone currencies	3,980.12	4,114.06	761.59
Cash Deposits of the H.R.[4]	**25,675.20**	**17,891.90**	**18,474.60**
Debt guaranteed by the Central Government	**9,987.61**	**14,306.26**	**13,896.65**

Source: Public Debt Bulletin, General Accounting Office, Ministry of Finance.

Notes:
1. Central Government Debt differs from General Government Debt (Maastricht definition) by the amount of intra-sectoral debt holdings and other ESA '95 adjustments.
2. Fixed/floating ratio is calculated taking into account i) interest rate swap transactions, ii) the use of funding instruments by the ESM regarding the loans that have been granted to the Hellenic Republic and iii) the incorporation of the risk metrics of the EFSF's liability portfolio into the Greek debt portfolio.
3. Index-linked bonds are classified as floating rate bonds.
4. Included balance of dedicated cash buffer account, 15,697.3 million euro on 31/03/2020 & 30/06/2020.
* Estimates.

2. Public Debt Bulletin, March 2021, General Accounting Office, Ministry of Finance.

mainly in regard to the corresponding quarter of 2020 (95.8% and 4.2%, respectively). An analogous change is observed in favor of the non-tradable to tradable debt, which stood at 22.7% and 77.3%, respectively, over the period considered. Finally, the composition of Central Government debt by currency remained essentially unchanged compared with the previous quarter, as well as to the same quarter of 2020 (98.9% in euro). In addition, as far as the guarantees provided by the Greek government are concerned, they display a relatively small increase, by 582 million euros or 3.3%, after continuous reductions.

The distribution of debt, based on the residual maturity in the first quarter of 2021, is reflected in Table 2.2.2. Short-term Greek government securities (with maturity less than one year) represent 14% of the total, compared to 10.7% from the medium-term notes (with maturities of one to five years), and 75.3% from long-term issues (maturity after five years) of 13.4%, 11.3% and 75.4%, respectively, which was the last quarter of 2020. Compared to the same quarter of 2020, there is no significant change in the debt distribution.

The average residual maturity of the total Central Government debt stood at 19.28 years, slightly decreased from that of 20.31 years in the corresponding quarter of 2020. It should be noted that the average residual maturity of the total Central Government debt has tripled since the country's entry to the support mechanism, which amounted to 7.65 years in the second quarter of 2010. Furthermore, regarding the new borrowing of the Greek government during the reporting period, the weighted average maturity rose to 8.06 years, with a significant increase from the level of 4.05 years at which it had formed at the end of 2020.

New borrowing for the first quarter of 2021 decomposes to 59.9% in Treasury Bills, 36.4% in fixed bonds, 3.6% in SURE loans and only 0.1% comes from European Investment Bank loans (Graph 2.2.1).

Graph 2.2.2 shows the redemption schedule of the Central Government debt based on the latest published data. From the display of newer data, it seems that apart from the present year (2021), the dispersion of the burden of redemption of public debt has now leveled, with few exceptions, at less than 10 billion euros per year until 2070.

In conclusion, debt, although it showed an increase in the last quarter, does not raise concerns, as the financing needs of the Greek economy were particularly high due to the pandemic and the measures needed to deal with its consequences. In this context, the Greek government maintained, utilized and improved the management of all government cash deposits, but also had a continuous publishing presence in the international capital markets, maintaining at the same levels the average weighted maturity of short-term borrowing and risk-taking ratios. The mixed financing needs arising from the pandemic were mainly met by consortium issues of fixed-rate, 15-year, 7-year and 10-year bonds.

To conclude, debt increased significantly, especially in terms of GDP, given the significant decline in GDP (debt to GDP ratio reached 205.6% in 2020), due to the significant increase in the Budget deficit, necessary to finance all the support measures for the economy in the effort to deal with the pandemic, as discussed in the previous section. However, the cost of the Greek government's borrowing was at historically low levels, as Greek government bonds were included in the

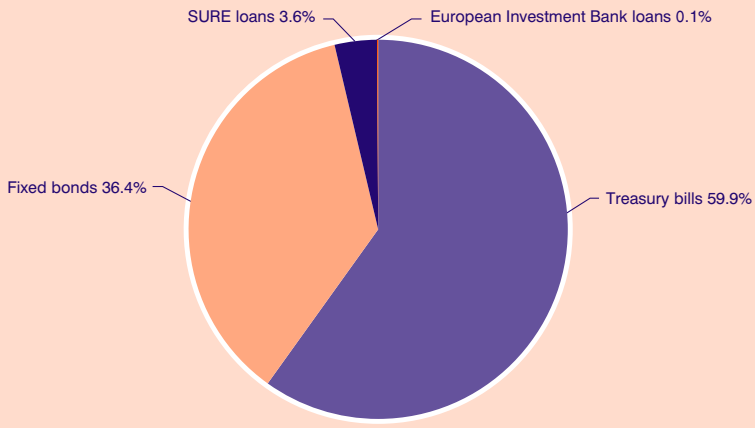
TABLE 2.2.2 Budgetary Central Government debt by residual maturity (amounts in mil. €)*

Period	2020Q1	2020Q4	2021Q1
Total volume	**361,828.74**	**374,005.73**	**380,795.05**
Short-term (up to 1 year)	48,445.79	52,461.48	53,464.91
Medium-term (1 to 5 years)	40,713.15	39,861.04	40,722.34
Long-term (more than 5 years)	272,669.80	281,683.21	286,607.80

Source: Public Debt Bulletin, General Accounting Office, Ministry of Finance.

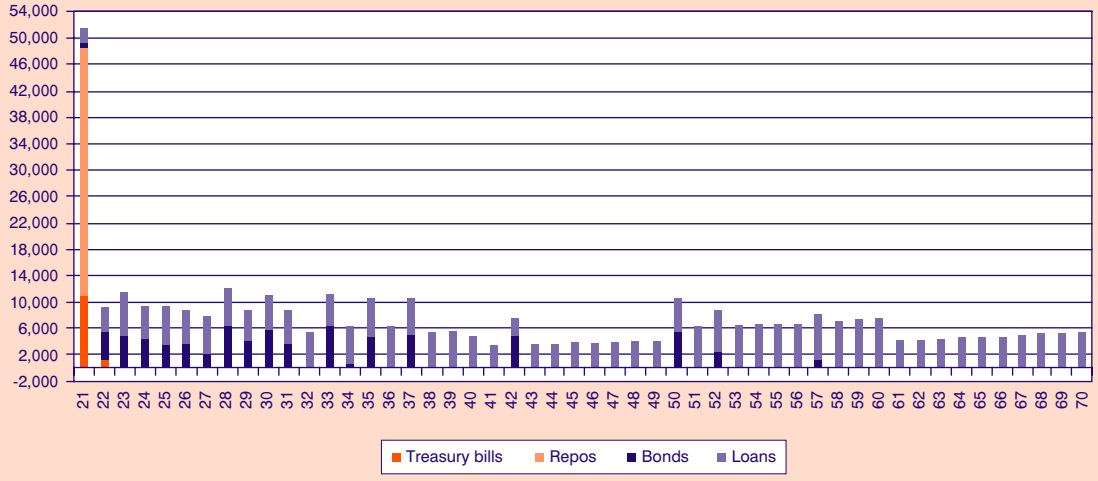
* It concerns the volume of bonds, interest-bearing bills and short-term securities and not the total Debt of the Central Administration.

GRAPH 2.2.1
Composition of borrowing, first quarter 2021



Source: Public Debt Bulletin, General Accounting Office, Ministry of Finance.

GRAPH 2.2.2
Redemption schedule of Budgetary Central Government Debt on 31/3/2021 (amounts in million euro)



Source: Public Debt Bulletin, General Accounting Office, Ministry of Finance.

Notes: Buy-backs are scheduled for the smoothening of redemptions.
Including extension of EFSF loans agreed on at the Eurogroup of 22-6-2018.

PEPP (Pandemic Emergency Purchase Program) of the European Central Bank (ECB) to address the financial consequences of the pandemic. In addition, the ECB accepted Greek bonds as collateral to provide liquidity to Greek banks. The upgrade of Greece's credit rating by Standard and Poor's and Moody's was a result and, at the same time, helped to further restrain Greek bond yields. Finally, lending, both long-term and short-term, contributes to the normalization of Greek bond maturities. Based on the above, the Greek public debt can be considered sustainable both in the medium and long term.

2.3. Fiscal figures perspectives

The evolution of the country's fiscal figures in the rest of 2021 depends on (a) the course of the health crisis

and especially the course of vaccinations, so that a wall of immunity can be created to control the pandemic and allow economic activity and especially tourism to function, both in summer and autumn when the fourth wave of the pandemic is expected, and (b) the timely absorption of the funds of the Development and Sustainability Fund, together with the low interest rates financing the Greek economy from the markets, will become the driving force that will lead to economic growth, necessary to balance the Budget deficits and reduce the public debt. However, the contribution of private investment in the implementation of the recovery plan, which will lead to multiplier benefits for the Greek economy, should also be important. A key element in this contribution will be the commercial banks and the credit they will channel for their financing.

Budget execution, which is significantly in deficit the period under examination compared to the corresponding period of 2020, will improve in the coming months. This will succeed by controlling the pandemic, as spending on pandemic measures taken earlier this year will be significantly reduced, but also with the simultaneous increase of revenues, due to the increase of taxes and social contributions collection. Thus, the estimates for a primary deficit of 7.2% of GDP by the Ministry of Finance is in line with the recent estimates of the European Commission (7.3% of GDP), while the IMF gives an even smaller deficit (6% of GDP). In addition, the level of economic development in 2021 will be an important element. The forecast for economic development of 3.6% of GDP in the Stability Program is rather conservative, given that the recession in the first quarter of 2.3% of GDP (as measured by ELSTAT) is threefold lower than expected by the Ministry of Finance, revenues are increased, as retail and catering businesses opened and the expected funds of the Development and Sustainability Fund will contribute to further improving the primary results. If, finally, the economic development in 2021 is a little over 4% of GDP, as predicted by the European Commission and Greek institutions such as KEPE, the Bank of Greece and the Parliamentary Budget Office, then the development of the Greek economy will be even better.

Regarding the public debt, its composition, financing needs and the ECB's loose monetary policy, in combination with the positive effect of the Fund for Recovery and Sustainability's funds in GDP in the coming years, will contribute greatly in the management of the Greek debt in the medium term. Finally, the economic development expected for 2021 and the coming years will contribute to the reduction of public debt as a percentage of GDP.

3. Human resources and social policies

KEPE, *Greek Economic Outlook,* issue 45, 2021, pp. 43-53

3.1. Recent developments in key labour market variables

Ioannis Cholezas

3.1.1. Introduction

The reduction in economic activity in 2020 due to the social distancing measures to contain the spread of the Covid-19 virus had adverse effects on the Greek GDP, which dropped by 8.2% compared to 2019, while the respective drop in the EU27 was 6.1%.[1] Employment was also hurt both in Greece and internationally. The economic measures introduced by the Greek government early on and in accordance with the European directions and practices managed to contain, but did not eliminate, the adverse economic consequences of the pandemic. Thus, both the number of the employed and the number of the unemployed decreased in 2020, while the impact of the pandemic on the labour market increased further if one considers the number of jobs that were not created due to uncertainty and the reduced economic activity. The axes of the analysis that follows confirm the variety of impacts the pandemic has had on the population and the changes in practices and behaviours caused by it. These changes dictate the reshaping of the institutional framework, which is already under way.

3.1.2. Employment

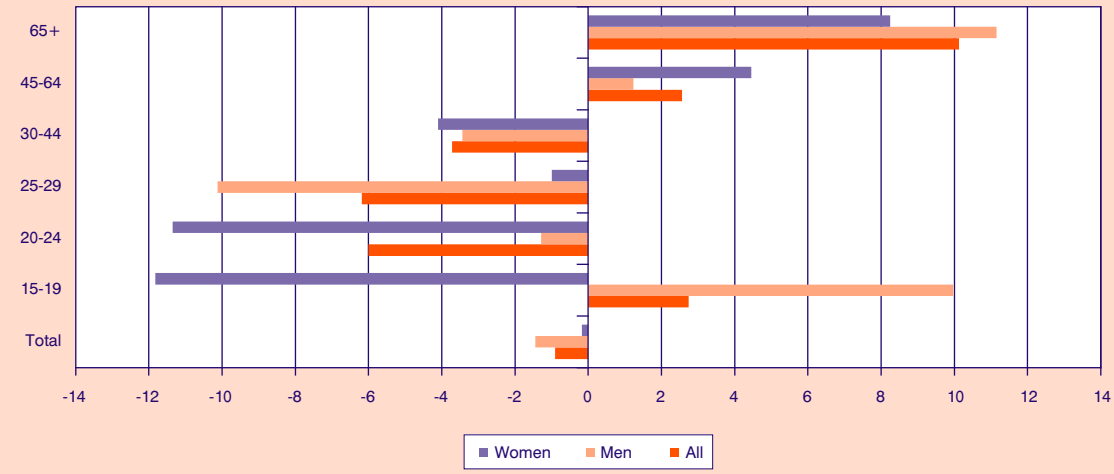
The number of the employed aged 15-74 decreased by 35.5 thousand people (or -0.9%), amounting to 3,875,500 individuals in 2020 on average (Graph 3.1.1). Given the unprecedented measures of social distancing to avoid the spread of the virus and the complete or partial suspension of many businesses, the reduction in employment seems rather small. The annual outcome was driven by the reduction in the number of the employed that took place in the second quarter (-2.8% or 112.4 thousand lost jobs) when the country faced the first wave of the pandemic. The age decomposition of the employed reveals that the biggest declines took place in age groups 25-29 and 30-44 (-21.7 thousand and -59.1 thousand, respectively). However, the proportional decreases in the number of the employed were the biggest in age groups 25-29 (-6.2%) and 20-24 (-6.0%). It seems, then, that irrespective of the criterion used, the age group 25-29 lost the most in terms of employment.

However, the scope of the negative impact of the pandemic does not involve only lost jobs. The fact that the Greek economy was experiencing an expansion in employment before the pandemic should also be considered. Note that approximately 96 thousand jobs were created in the second quarter of 2019, while 112.4 thousand jobs were lost in the first quarter of 2020. Their sum exceeds 200 thousand lost jobs overall, and it probably reflects a better estimate of the employment losses due to the pandemic. Assuming that employment would have increased in a similar manner in 2020 as it did in 2019 may be moderate. In the fourth quarter of 2019, new jobs were indeed fewer than those in the previous two years, but in the first three quarters of 2019, the number of new jobs exceeded the respective number in 2018 (Graph 3.1.2).

Men were more likely to lose their job in 2020. The number of employed men decreased by 32.8 thousand persons, while the number of employed women decreased by nearly 2.8 thousand persons. Actually, the number of employed women decreased by -0.2% throughout 2020, despite the fact that it had reached -2.4% in the second quarter of 2020. However, Graph 3.1.1 shows that there have been groups within both genders that followed a different path, either compared to the other same gender groups or compared to the general declining trend. In this context, the number of employed men aged 15-19 increased along with men and women aged 45+ whose number also increased. On the contrary, the reduction in the number of employed women aged 15-24 and employed men aged 25-29 far exceeded the average reduction. These dif-

1. See <https://ec.europa.eu/eurostat/databrowser/view/tec00115/default/table?lang=en>.

GRAPH 3.1.1
Proportional change in the number of the employed by age group and gender, 2019-2020 (%)



Source: Labour Force Survey, ELSTAT, KEPE processing.

GRAPH 3.1.2
Annual change in the number of the employed by quarter (in '000s)

Source: Labour Force Survey, ELSTAT, KEPE processing.

ferences are probably the result of the uneven distribution of the pandemic's impact on sectors of economic activity and occupations combined with gender and age segregation.

Despite horizontal support measures that addressed the entire economy in 2020, the sector of economic activity proved important for the size of the pandemic's impact (Table 3.1.1). The decrease in the number of the employed in the already declining sector of *Agriculture, forestry and fishing* was three times bigger in 2020 compared to 2019; hence, the pandemic sped up the developments. From the remaining sectors, which employ a significant share of the workforce, both *Manufacturing* and *Accommodation and food service activities* saw the number of the employed persons drop, while in 2019, they both exhibited an increase. Thus, the pandemic reversed the trend.

TABLE 3.1.1 Employed individuals by sector of economic activity and decreasing share of total employment share

	Change 2018-2019		Change 2019-2020		2020	
	('000s)	(%)	('000s)	(%)	('000s)	(%)*
Wholesale and retail trade, repair of motor vehicles and motorcycles	3.4	0.5	21.8	3.2	713.7	18.4
Agriculture, forestry and fishing	-16.0	-3.4	-41.6	*-9.2*	412.0	10.6
Manufacturing	19.3	5.4	-6.0	*-1.6*	371.1	9.6
Public administration and defence, compulsory social security	4.8	1.4	9.0	2.7	350.5	9.0
Accommodation and food service activities	20.2	5.6	-38.2	*-10.0*	343.7	8.9
Education	17.7	5.8	3.0	0.9	323.9	8.4
Human health and social work activities	5.8	2.4	20.6	8.3	269.0	6.9
Professional, scientific and technical activities	3.7	1.7	11.3	5.2	229.5	5.9
Transportation and storage	22.2	12.0	1.6	0.8	208.5	5.4
Construction	-4.0	-2.6	-6.9	*-4.6*	140.8	3.6
Information and communication	5.5	5.7	-2.1	*-2.1*	100.1	2.6
Other service activities	1.6	2.0	4.4	5.3	87.0	2.2
Administrative and support service activities	2.5	2.8	-6.1	*-6.7*	84.8	2.2
Financial and insurance activities	-3.4	-3.9	0.4	0.4	84.6	2.2
Arts, entertainment and recreation	1.3	2.5	3.0	5.5	56.7	1.5
Electricity, gas, steam and air conditioning supply	-1.1	-3.6	2.9	9.7	32.5	0.8
Water supply, sewerage, waste management and remediation activities	0.8	2.5	-7.2	*-21.7*	26.0	0.7
Activities of households as employers	-4.9	-16.3	-3.4	*-13.6*	21.6	0.6
Mining and quarrying	1.2	10.6	-1.4	*-11.2*	11.1	0.3
Real estate activities	0.1	2.0	0.1	2.0	5.1	0.1
Activities of extraterritorial organizations and bodies	2.2	103.5	-0.7	*-17.3*	3.6	0.1
Total	**83.0**	**2.2**	**-35.5**	**-0.9**	**-**	**-**

Source: Labour Force Survey, ELSTAT, KEPE processing.

*: The column represents shares of total employment.

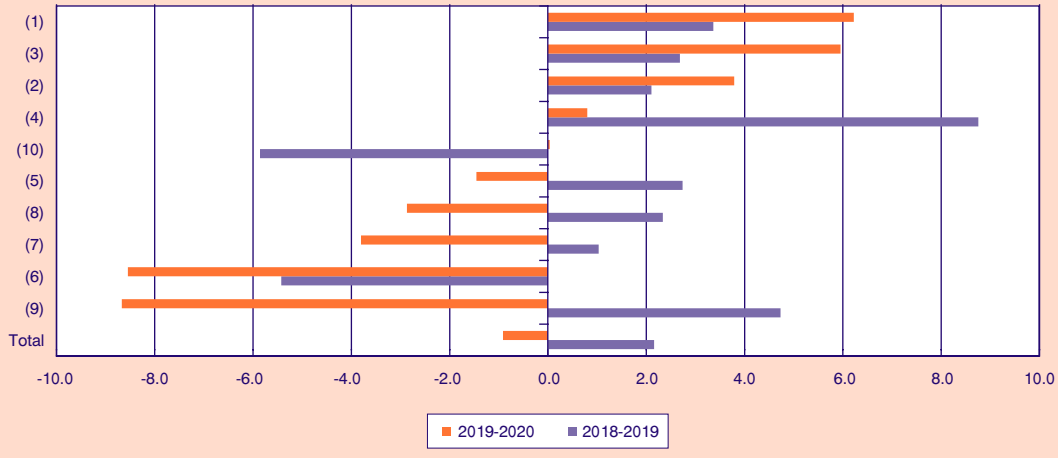
Notes: a) sectors are ranked based on their shares in total employment in 2020, b) italics represent a bigger than average decrease in period 2019-2020.

On the other hand, the number of the employed in *Wholesale and retail trade, etc.* increased by 3.2% in 2020 when, most of the time, stores were closed or operated under restrictions. Interestingly enough, the respective increase in 2019 did not exceed 0.5%. This is probably the best proof of the strong effects government support measures have had on the labour market. However, one should not ignore the fact that certain areas of commercial activity were strengthened during the pandemic, like e-stores, as well as some complementary activities, like transport services. On the other hand, the number of the employed in *Human health and social work activities* increased, as expected, due to the increased demand for doctors, nurses, etc., because of the pandemic.

The number of the employed increased in five out of ten occupation groups (Graph 3.1.3). Six groups had a share bigger than 8% in 2020. Of these groups, the number of employed individuals decreased in *Skilled agricultural and fishery workers* by -8.5%, while the number of the employed in *Technicians and associate professionals* increased by 6.0%. It is evident that the general trend shifted in 2020, since in 2019, only two occupational groups exhibited a decrease in their size. It is also interesting that the number of the employed in the first three groups in Graph 3.1.1 increased faster than in 2019.

The biggest part of the decrease in the number of the employed was in paid employees (-22.6 thousand)[2] and self-employed without personnel (-16.8 thousand). However, in relative terms, the number of those working in family businesses and the number of self-employed without personnel decreased the most. On the contrary, the number of self-employed with personnel increased by almost 11 thousand persons or 3.7%. Graph 3.1.4 shows that these changes are not equally distributed across the year. Interestingly enough, the number of self-employed with personnel increased considerably in the third and fourth quarters of the year, while a big decrease in the number of assistants in family businesses was recorded in the last quarter. Overall, the share of paid employees in total employment remained unchanged in 2020, at 68.1%; the share of self-employed with personnel increased at 7.7%; and the shares of the remaining two groups decreased.

GRAPH 3.1.3
Annual change in employed individuals by occupation (%)

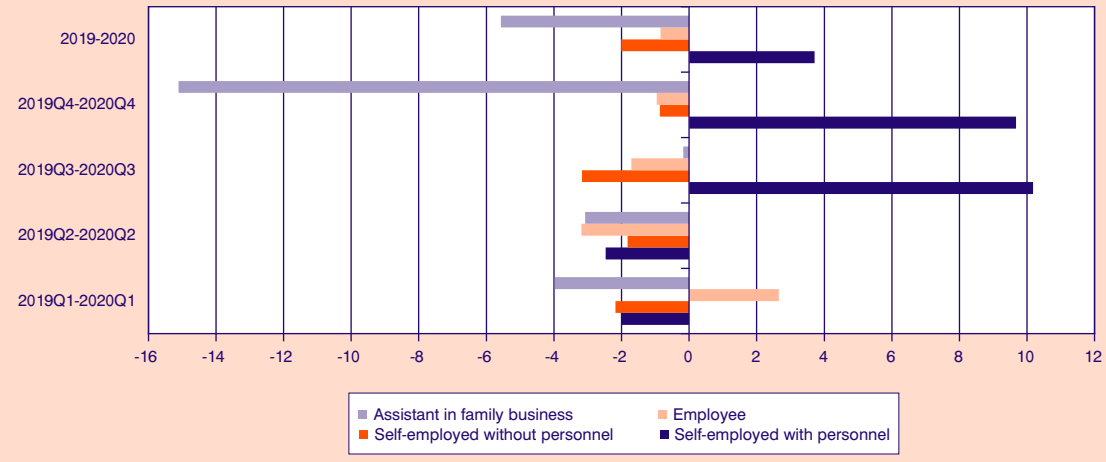


Source: Labour Force Survey, ELSTAT, KEPE processing.

Notes: a) the numbers on the vertical axis stand for (1) Legislators, senior officials and managers, (2) Professionals, (3) Technicians and associate professionals, (4) Clerks, (5) Service workers and shop and market sales workers, (6) Skilled agricultural and fishery workers, (7) Craft and related trades workers, (8) Plant and machine operators and assemblers, (9) Elementary occupations, (10) Armed forces, b) occupations were ranked in descending order of the absolute change in period 2019-2020.

2. On the other hand, the ERGANI report for December 2020 recorded an increase in paid employees by 93,003 individuals throughout 2020. Note that the Labour Force Survey is a survey, while ERGANI relies on administrative data. Therefore, some divergence between the two is expected, e.g., due to unreported labour.

GRAPH 3.1.4
Annual change in employed individuals by position (%)



Source: Labour Force Survey, ELSTAT, KEPE processing.

Except for the effects of the pandemic on the number of the employed, one can define additional effects on employment based on four indices: absence from work, work from home (distance working), working hours and the number of individuals looking for work, but are not immediately available to work. The evolution of these indices is presented in Table 3.1.2. The incidence of absence from work increased in the first quarter of 2020. However, the biggest increase was recorded in the second and third quarters of 2020 when travel restrictions were introduced and many firms were forced to shut down. The share of those working from home exhibited a more gradual increase, following a similar pattern with absence from work, thus increasing considerably in the second and fourth quarters of 2020. The fact that work from home increased more in the last quarter of the year than in the second quarter, when the first wave of the pandemic unfolded, could probably be attributed to the necessary time, mostly for firms, to adapt to the prerequisites of distance work, e.g., acquiring the necessary technical equipment.

The right to reduce working hours given to firms facing a stark decrease in demand for their products and services led to an expected reduction in weekly working hours throughout the economy. The reduction exceeded nine hours in the second quarter of 2020 compared to the respective quarter in 2019 and stood at 30 hours per week. Unsurprisingly, the reduction was evident already in the first quarter of the year; following a recovery in the third quarter, another plunge took place in the last quarter. Last but not least, the share of those looking for work, but not immediately available to work did not follow the same path with the indices already discussed. It increased in the first two quarters of the year, more intensely in the second quarter of 2020, but it remained smaller compared to 2019. This could probably be explained by the realisation that the emergency would not end as soon as initially expected when the pandemic appeared in early 2020; hence, there was no reason to postpone the inevitable, i.e., going to work when one was found.

The sector of economic activity is a defining parameter for the first three indices even when sectors are grouped together for statistical purposes (see Table 3.1.3). The wider sector of *Trade, accommodation, etc.*, for example, exhibits the biggest share of employed individuals who were absent from work, approximately one out of three in the second quarter of 2020 and one out of four in the last quarter. The heterogeneous sector of *Other services* follows.[3] On the contrary, the share is significantly smaller in the sectors of *Manufacturing and energy* and *Agriculture, forestry and fishery*.

The situation is similar for the share of those working from home. Due to the nature of their activities,

3. *Construction* exhibits an unusually big share in 2020Q2 without a straightforward explanation.

TABLE 3.1.2 Indices measuring the impact of the pandemic in the labour market

	Absence from work* (%)	Work from home* (%)	Working hours	Looking for work, but not available to work immediately** (%)
2019Q1	3.3	5.2	38.2	1.6
2019Q2	2.0	5.3	39.4	0.7
2019Q3	6.9	5.1	38.5	0.7
2019Q4	2.8	5.4	39.1	1.8
2020Q1	9.2	6.6	35.5	3.4
2020Q2	22.3	10.7	30.3	1.6
2020Q3	8.6	9.3	38.4	0.5
2020Q4	11.6	15	35.3	1.2
Annual change (percentage points)				
2019Q1-2020Q1	5.9	1.4	-2.7	1.8
2019Q2-2020Q2	20.3	5.4	-9.1	0.9
2019Q3-2020Q3	1.7	4.2	-0.1	-0.2
2019Q4-2020Q4	8.8	9.6	-3.8	-0.6

Source: ELSTAT, Press Release Labour Force Survey, Quarters Q1, Q2, Q3, Q4 in 2020.

*: as a share of total employed, **: as a share of inactive individuals aged 15-74.

it is easier for some sectors of economic activity to embrace work from home. This seems to be true for *Financial and business activities* followed by *Other services*; these sectors have triple and more than double the shares of work from home, respectively, than the average share for the entire economy. Another interesting fact is that the shares of those working from home do not decrease as in the case of those absent from work, which, of course, as a practice has certain boundaries. This could be an indication that work from home is not a temporary trend and, therefore, it is necessary to build a suitable institutional framework –a process which has already begun, as discussed next.

Sectors of economic activity also differ with respect to working hours. The longest working hours per week are found in *Trade, accommodation, etc.* (>40) and *Manufacturing and energy* (approximately 40), while the shortest weekly working hours are found in *Other services* (<34). Working hours decreased in almost all sectors of economic activity in 2020 and in all quarters compared to 2019. However, in *Trade, accommodation, etc.* the average annual reduction exceeded six hours (>13 in 2020Q2), while in *Construction* and *Financial and business activities,* the weekly decrease was nearly four hours and peaked in the second quarter of 2020 (-11.6 and -8.6 hours, respectively).

In any case, the reader should bear in mind that measures introduced to support employment had an impact on the labour market. Therefore, it is not an easy task to directly assess the net impact of the pandemic. On the one hand, scheduled layoffs never took place, since maintaining the same number of workers was a prerequisite to benefit from support measures, while flexibility was increased through work from home and the reduction in working hours at will with the programme SYN-ERGASIA. On the other hand, seasonal hires were severely reduced due to uncertainty and restraining measures that led to lower demand for many goods and services, like those associated with tourism and food service activities.

TABLE 3.1.3 Indices measuring the impact of the pandemic on the labour market by sector of economic activity

	2019Q1	2019Q2	2019Q3	2019Q4	2020Q1	2020Q2	2020Q3	2020Q4
Absence from work								
Agriculture, forestry and fishing	10,4	2,2	2,0	6,7	10,0	5,4	2,8	6,1
Manufacturing and energy	1,1	1,1	5,3	0,7	5,0	14,8	5,1	4,9
Construction	2,1	0,7	2,9	2,3	8,4	26,2	3,0	8,2
Trade, accommodation, restaurants, transport and communication	2,2	1,0	2,8	1,8	10,0	30,3	5,2	18,8
Financial and business activities	1,1	0,6	5,4	1,8	6,7	18,6	6,5	6,5
Other services	3,5	4,4	16,2	3,7	10,7	23,5	17,7	10,5
Work from home								
Agriculture, forestry and fishing	2,5	2,9	2,9	3,3	3,7	3,1	3,0	3,2
Manufacturing and energy	2,5	2,4	2,3	2,5	3,3	4,6	4,5	6,9
Construction	3,1	3,0	3,3	3,5	4,3	5,8	4,7	5,8
Trade, accommodation, restaurants, transport and communication	2,6	2,8	3,0	3,3	4,1	5,1	5,4	7,3
Financial and business activities	11,9	11,9	11,8	12,3	14,2	21,0	22,8	31,3
Other services	8,1	8,4	7,6	7,5	9,6	19,4	13,6	25,6
Working hours								
Agriculture, forestry and fishing	33,9	40,2	41,5	38,0	34,1	38,4	42,9	38,8
Manufacturing and energy	39,8	40,0	39,8	40,4	38,1	33,7	39,7	39,1
Construction	37,2	38,6	38,9	38,4	35,0	27,0	40,3	35,6
Trade, accommodation, restaurants, transport and communication	41,8	42,9	42,6	42,2	37,7	29,2	42,0	35,0
Financial and business activities	39,8	40,2	39,1	40,4	37,2	31,6	38,8	37,2
Other services	34,6	34,4	31,3	34,6	31,6	26,8	31,4	32,3

Source: ELSTAT, Press Release Labour Force Survey, Quarters Q1, Q2, Q3, Q4 in 2020.

3.1.3. Recent developments on paid employment

As far as paid employment is concerned, the most recent report from ERGANI involves April 2020 and outlines developments in the first four months of the year. The number of new jobs increased since last April (33,210 vs. 7,205), while in the first four months, 109,091 more new jobs were created than the respective period in 2019. However, it should be noted that the labour market underperformed compared to previous years, at least since 2014. Interestingly enough, the share of new full-time job contracts increased to 63.1%, which is much bigger than 50%, i.e., the maximum share in previous years. Of course, this could be just temporary, especially considering that the share seemed to gradually drop from 66.9% in January to 58.5% in April. Limited mobility is also recorded regarding job contracts converted from full-time to either part-time or work-in-shift job contracts. In the first four months of the year, these were dominated by conver-

sions of full-time to part-time contracts (>75%), possibly because state support measures and the flexibility in working hours associated with them made other choices unnecessary.

The sectors of economic activity that reported the biggest positive net flows of paid employees in the first four months of 2020 include wholesale and retail trade, education, human health services, public administration and defence; while in March and April, food services, retail trade and accommodation activities exhibited dynamism as a response to relaxing social distancing constraints and the gradual recovery of economic activity. Labour demand across occupations was determined in accordance with sectors of economic activity. The occupations most in demand included salespersons, teaching staff, clerks, drivers, couriers and unskilled workers. In April, there was a strong demand for occupations related to food services, like waiters, cooks and roasters, salespersons and cashiers at commercial businesses.

3.1.4. Unemployment

Contrary to what is usually observed, the decrease in the number of the employed in 2020 was coupled with a decrease in the number of the unemployed, which equalled 64 thousand persons. The most plausible explanation is that some of those who lost their job exited the labour force, i.e., they decided to stop looking for a job. Exploring this hypothesis using Eurostat[4] data reveals that, indeed, the share of those who transited from employment to inactivity increased from 0.9% in 2019 to 1.2% of the total employed in 2020, while the share reached its maximum value in the second quarter of 2020 (1.4%).

The biggest part of the decrease in the number of the unemployed is attributed to women (-45.4 thousand) and persons aged 30-44 (-36.6 thousand), while those aged 45-64 also contributed considerably to the decrease (-22.7 thousand). The only age group of unemployed persons that increased was group 25-29. Throughout the year, the number of the unemployed decreased from 819 thousand people in 2019 to 755 thousand in 2020. The number of the unemployed increased amongst persons aged 25-29, mostly because the number of unemployed men also increased. The composition of the pool of the unemployed based on educational attainment is also quite heterogeneous. The decrease in the number of the unemployed was mainly fuelled by the reduction in the number of unemployed primary education graduates at most (-28.5 thousand) who are usually older, hence they may head towards retirement. On the contrary, the number of the unemployed with post-graduate studies and tertiary education graduates increased during 2020 by 2.7 thousand and 4.7 thousand persons, respectively.

The combined effect of the above changes is the reduction of the unemployment rate by a percentage point in 2020. Hence, the annual unemployment rate stood at 16.3% in 2020, 16.2% in the last quarter and 16% in January 2021.[5] The unemployment rate decreased faster for women, but they still faced lower chances of getting a job than men (19.8% vs. 13.5%). Similarly, the unemployment rate for youth aged 15-24 dropped only marginally and less than that for individuals aged 25+. This means that differences in the probability of finding a job across the age distribution remained significant. Last but not least, the unemployment rate decreased for all education groups in 2020 with the exception of tertiary education graduates. This is a point worth discussing, especially since the sectors that seemed to have suffered the most from the pandemic usually employ graduates from the low levels of education.[6]

3.1.5. Institutional reforms in the labour market

A new bill on distance work, or teleworking as it is usually referred to, in the public sector was made public this April.[7] Until the writing of this article, it has not been voted on yet, but the process of public consultation has been completed; hence, not much is expected to change. Several crucial provisions aim to protect the employee and to discourage illegal practices on behalf of the employer –the public sector in this case– so long as the supply of distance work is feasible. These provisions refer to the right of the employee to disconnect outside normal working hours; the obligation of the employer to supply the necessary equipment for distance work (teleworking station) and to bear the cost of operation and maintenance; the strict ban of any kind of employee monitoring, e.g., through video cameras or other means; the use of suitable software to perform conference calls that ensures the safety of the

4. See <https://ec.europa.eu/eurostat/databrowser/view/LFSI_LONG_Q__custom_937440/default/table>.

5. See ELSTAT, January 2021, Press Release, May 17, 2021.

6. It is not uncommon in the Greek labour market to hire people with more skills than those required for the job, given the lack of suitable jobs.

7. See <http://www.opengov.gr/ypes/?p=7851>.

participants, e.g., through encryption and link protection; the voluntary nature of distance work unless there are serious health reasons, e.g., a pandemic, in which case the employee is forced to accept the employer's proposition for teleworking. Moreover, distance work must be supplied in predetermined days per week and month, and it cannot exceed forty days per year during a three month period. No teleworking is allowed during the period July 1st – August 31st. Employees who offer their services through distance work have the same rights and obligations as other employees, while the number of teleworking employees should not exceed 25% of total employees in the directorate (or stand-alone department).

The bill seems to move in the right direction by setting rules to a recently emerged field, that of distance work. However, there are some points that would probably benefit from further dialogue. The prerequisites to decide whether teleworking is feasible or not should be clearly determined so that they are not interpreted at will by the supervisor. Moreover, it must be ensured that the necessary technical requirements are met in order to supply distance work and to assess whether it has been supplied properly, which is an issue not addressed in the relevant bill. Time constraints for teleworking set by the bill may limit the chances of people with mobility problems, or other problems that hinder their physical presence in the workplace, to offer their services, while they reduce the chances of utilising teleworking to improve work-family life balance. It would probably be useful to discuss more flexible rules for specific categories of employees, e.g., parents with very young children. Moreover, the voluntary nature of teleworking, as far as the legal entity is concerned, may lead to its disuse. It would be more useful to make distance work mandatory for a certain share of the body's employees and allow everyone to take turns.

Assessing the work produced during teleworking is a necessary condition in order to avoid making teleworking an excuse for reducing the public sector's productivity. In this context, setting specific targets is a necessary requirement, and it would benefit the process by increasing workers' flexibility by allowing them to choose their working hours themselves, perhaps even outside normal working hours. As far as the assessment of the employee's request to work from home is concerned, a written justification of the decision to accept or reject the request should be required. Otherwise, the period of ten days followed by an automatic rejection could lead to requests being rejected without any justification and weaken the reform effort.

The second legislative initiative by the Ministry of Labour and Social Affairs has been made public recently and is going through the process of public consultation.[8] The bill is similar to the one for the public sector. It provides the definition of distance work and the right of the employee to disconnect outside normal working hours; it also provides for the employer's obligation to provide suitable and necessary equipment to the employee and to cover the expenses for its maintenance, forbids the use of cameras to monitor the employee, and provides for the same rights and obligations irrespective of whether the employee is working from home or not, etc. A troubling point is the right of the employee who works from home to disconnect, since the bill refers to it as an employee's right rather than an employer's obligation.[9] Obviously, no one believes that a bill could solve all problems in the Greek labour market, but it is an opportunity to open a dialogue for the improvement of working life.

Probably the key reform is the introduction of the digital work card, which aims at reducing abusive practices on behalf of some employers and fighting undeclared and uninsured labour. The bill provides for real-time recording of any change made in the worker's time schedule, e.g., what time work starts and finishes, when the break is taking place, whether normal working hours are exceeded, etc. It also provides for the direct crosschecking of real-time data with the Analytical Periodic Statements submitted by firms, and it allows for inspections by the Labour Inspectorate (SEPE) to be conducted. The details of the digital card have not been fully disclosed, but certainly this is not a simple task and should be treated seriously so long as there is the political will to enhance the protection of employees. It should be made clear, though, that without intensifying inspections of the labour market, the digital work card will not yield the expected results.

In this context, another reform is the upgrade of the Labour Inspectorate (SEPE) to an independent authority. Some relevant questions include how soon the upgrade could be completed, what is best way for the Labour Inspectorate to operate during the transition, which safety procedures are necessary to oper-

8. See <http://www.opengov.gr/minlab/?p=4977>.

9. Interestingly enough according to research published in January 2021 by INE-GSEE (the General Confederation of Greek Labourer's Institute of Research), 65% of private sector employees consider that teleworking had a negative effect on working hours. See <https://www.naftemporiki.gr/finance/story/1682544/alco-ereuna-sxedon-6-stous-10-ergazomenous-ston-idiotiko-tomea-dilonoun-meiosi-eisodimaton>.

ate efficiently and for the benefit of the employees, as well as whether the body will be reinforced with new equipment and human resources, which is considered to be currently lacking. Other interventions included in the bill involve rules for teleworking and the employee's right to disconnect outside normal working hours, similar to the bill for the public sector. A very important provision gives the Labour Inspectorate access to the communication data between the employee and the employer; however, once again, the question is whether there is the necessary capacity in terms of technical equipment and human resources to perform such a demanding task. Moreover, one of the key points of the bill is the promotion of balance between work and family life with the introduction of a fourteen-day paternal leave, a parental leave of four months (two months subsidised by OAED) for both parents and the ability to adopt flexible work arrangements for parents with children up to twelve years old. Probably the biggest challenge will be to persuade men to make use of these benefits, since the Greek reality still favours a traditional distribution of gender roles at home, forcing women to assume more responsibilities than men when it comes to taking care of children and running the household. It is also likely that men could be afraid to use such benefits in order to avoid being discriminated against by employers.

Moreover, the bill introduces several measures to fight violence and harassment at work. This way, Greece is adapting to Convention number 190 of the International Labour Office (ILO).[10] This is a positive step, but it should be accompanied with specific solutions that allow victims to respond in order to become effective, while the establishment of a special department at the Labour Inspectorate is in the right direction. The bill also provides for the minimum guaranteed personnel equal to 33% of all personnel in utility companies in order to relieve the negative impacts during strikes. However, this provision decreases the effectiveness of strikes and is expected to cause opposition. The bill expands the cases of invalid layoffs to include all circumstances in which the employee has exercised her rights, while it abolishes the distinction between clerks and craftsmen regarding layoff compensations, thus correcting an injustice. These last two provisions move towards the right direction, but there should be more efforts to find better and more suitable ways in terms of cost and time for the employees to react to violations of the labour law.

Giving the opportunity to the employee to arrange her working time by increasing working hours some days and reducing working hours others without being entitled to overtime pay and as long as both sides agree is going to be a point of conflict. The provision paves the way for a four-day working week without a reduction in earnings (keeping overall weekly working hours constant) and the flexible employment of parents and carers with individual job contracts, but it risks arbitrary behaviour on behalf of the employers and circumventing the eight-hour work day, especially in the context of substituting collective with individual job contracts. Therefore, special attention needs to be paid, since the provision tacitly assumes there is a balance of power between employees and employers, which is obviously not the case. Providing for the invalidity of a layoff in case the employee refuses to accept the employer's proposal is a safety valve. However, given the high unemployment rate and the cost in terms of money and time associated with settling any disagreement between the two parties, it is doubtful whether it can ensure a balance of power.

Another provision that is likely to cause opposition is the increase by 50% in the number of hours of overtime permitted (to 150 hours annually) while equating the limit between manufacturing and other sectors of economic activity. Note that the amount of overtime pay is increased to 120% of the wage rate. However, it involves only the hours of overtime for which the proper procedure of approval has not been followed. In any case, it seems odd to choose to employ people overtime when the unemployment rate remains high; unless these people are very high skilled and impossible to substitute with temporary workers. The role of the Labour Inspectorate would be crucial at this point to ensure the deal is honoured. It would probably be a good idea to recognise the employee's right to refuse to work overtime under certain circumstances. Otherwise, the employer would be able to demand overtime work without the consent of the employee.

To summarise the discussion so far, planned reforms could improve employee protection and increase flexibility to the benefit of both sides in a difficult period ahead for the Greek economy. However, some parameters must be discussed more thoroughly with the social partners in order to achieve the necessary understanding and perhaps make some adjustments that could lead to a valuable consensus for the effective implementation of the reforms. It is absolutely necessary to reinforce the Labour Inspectorate in order to

10. See <https://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:12100:0::NO::P12100_ILO_CODE:C190>.

operate as a balancing factor between employees and employers and to protect more efficiently the former who hold little bargaining power.

The successful settlement of labour issues that came up during the pandemic, while respecting labour rights, could improve working conditions and establish a welcoming field for attracting distance workers from abroad, known as digital nomads, to Greece. The benefits could be important and could also compensate to some degree for the losses Greece suffered during the crisis from brain drain, i.e., the migration of highly skilled individuals.

Last but not least, the consultation process for the determination of the new minimum wage has begun after two years of postponements. The process involves social partners and research institutes, but the final decision is made by the government and the Ministry of Labour and Social Affairs. At this stage, all parties have prepared and submitted their reports to Organisation for Mediation and Arbitration (OMED). They assess the health of the Greek economy, the special economic circumstances characterised by great uncertainty due to the pandemic and the impact of relaxing the state measures supporting firms and employment, as well as the short- to medium-term prospects of the Greek economy. The result of the consultation process cannot be determined *a priori,* since there seem to be suggestions to increase, decrease or keep the minimum wage at its current level, while all participants have arguments. Irrespective of the result, though, the interesting part is that the consultation process has increased transparency and dialogue between stakeholders for an issue that involves the entire Greek economy and labour market, while it attracts ever greater attention at the European level, as is evident by the EU directive on setting adequate minimum wages.[11]

11. See <https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2020:0682:FIN:EL:PDF>.

KEPE, *Greek Economic Outlook,* issue 45, 2021, pp. 54-57

3.2. Recent developments in income inequality in the EU15[1]

Vlassis Missos

3.2.1. Introduction

The official database utilized for the estimation of the most widely used indicators of income inequality is referred to as the Survey of Income and Living Conditions (EUSILC). EUSILC is an annual sample survey autonomously conducted by each national statistical authority of the EU member states under the supervision of Eurostat.[2] The methodology of processing and managing the collected micro-data follows the broadly accepted basic principles that are applied among the countries of the EU. As a result, this common methodology allows for the construction of indices that are consistent, while also permitting comparability between the different economies. In that way, the investigation of income inequality among 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 annual EUSILC surveys is subject to delays and the availability of the micro-data is marked by significant time lags. For example, during the period this article was written, the most recently published micro-database referred to the EUSILC of 2019, which corresponds to household income earned in the previous year (2018).

This presentation is limited to three 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 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 indicators of income inequality

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.[3] 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 2018 (EUSILC 2019). First, the *Gini* is calculated according to the distribution of equivalized disposable income, estimated before and after social transfers have been made. 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. 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.

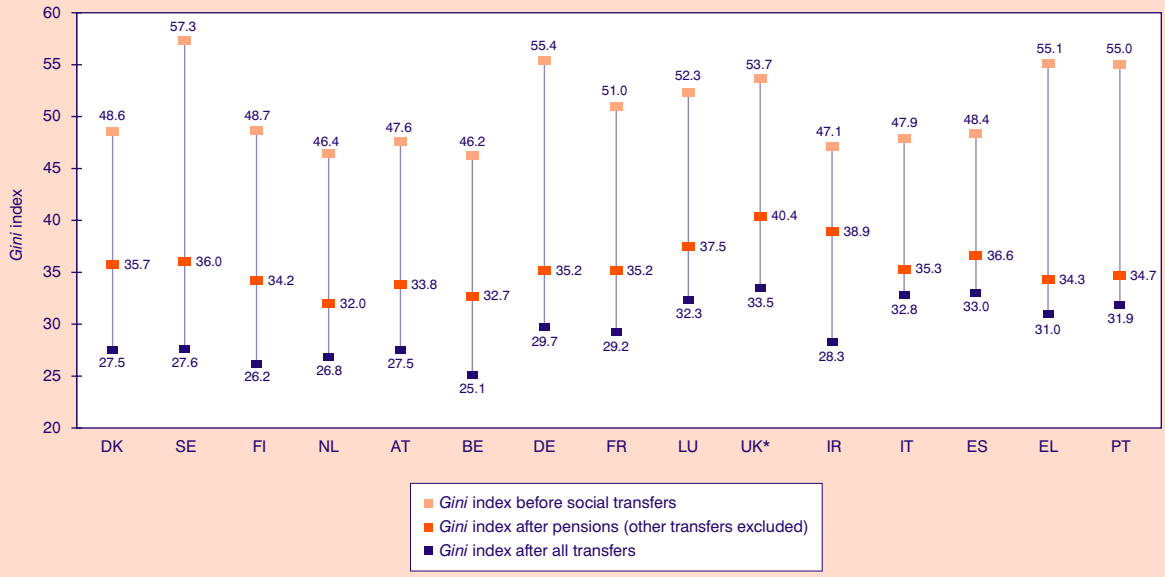
Obviously, among the countries of the EU15, the values of the *Gini* index measured before social transfers are substantially different. In Belgium (46.2), the Netherlands (46.4), Austria (47.6) and Ireland (47.1),

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). The UK is included since the data refer to a period that is prior to its date of exiting the EU (31 January, 2020).

2. See Missos V. (2019), "Income inequality indices in the European Union (EU15)", *Greek Economic Outlook,* issue 39, pp. 38-41.

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

FIGURE 3.2.1
***Gini* index before and after social transfers, EU15, 2018**



Source: Eurostat, EUSILC.

* Years 2016 and 2017.

inequality is estimated to be relatively low, whereas in Greece and Portugal, it tends to be higher –55.1 and 55, respectively. At the same time, the highest level is estimated for Sweden (57.3), indicating the sharp level of inequality that would have been, had the social-democratic model of social protection not intervened to alleviate the social tension expected to result from such an unfavorable income distribution. Furthermore, a clear disproportional downturn in the level of inequality is shown immediately after the amount of pensions is included.

For example, the *Gini* index after pensions and before other social transfers decreases for the Netherlands (32) and Belgium (32.7), while for the United Kingdom (40.4) and Ireland (38.9), it remains higher. Lastly, after the rest of the social transfers are paid, inequality drops even lower, rearranging the ranking of income inequality among the countries of EU15. Belgium (25.1), Finland (26.2) and Sweden now present the lowest levels. On the other hand, the United Kingdom (33.5), Spain (33) and Italy (32.8) are estimated to be at the highest places.

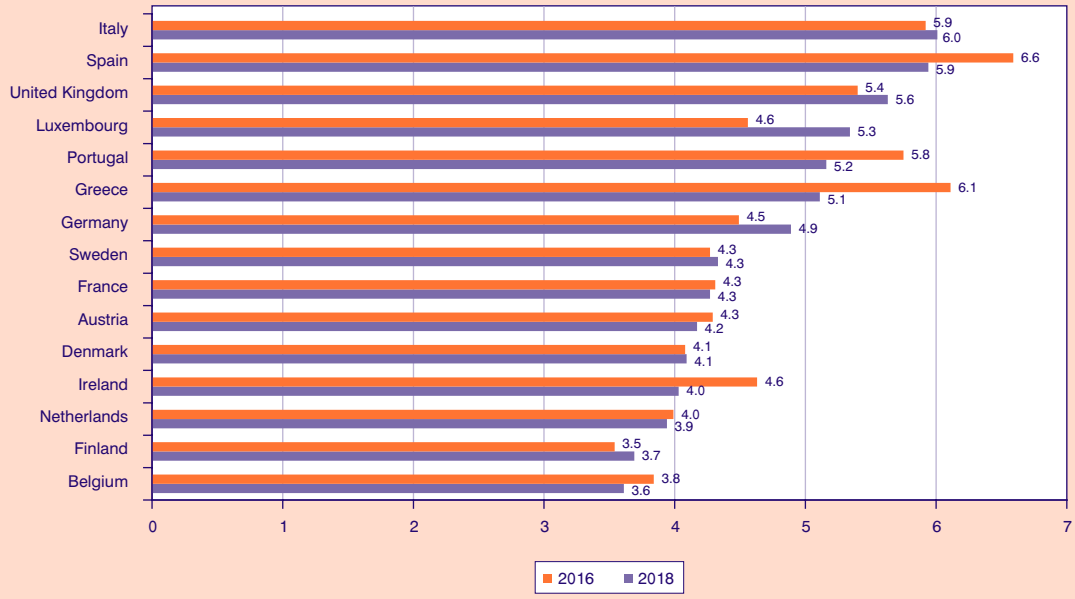
An additional index used to record inequality is the income quintile share ratio (s80/s20). Based on the definition of personal income as stated above, we take a further step, ranking the population from the poorest to the wealthiest households, creating five equally populated groups. As a measure, the 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 presents the index of income distribution between the two quintiles for the years 2016 and 2018, for all countries of the EU15, as measured by the EUSILC. According to the EUSILC 2019, the inequality index is lower for Belgium (3.6), Finland (3.7) and the Netherlands (3.9). On the contrary, higher values are calculated for Italy (6.0), Spain (5.9) and the United Kingdom (5.6). In addition, an important issue has to do with the fact that, from 2016 and 2018, the relation between the two quintiles improved in Spain, Portugal, Greece and Ireland whereas for Germany and Ireland, increases are only marginal.

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 depicts the rates of poverty for 2018, as calculated before and after pensions

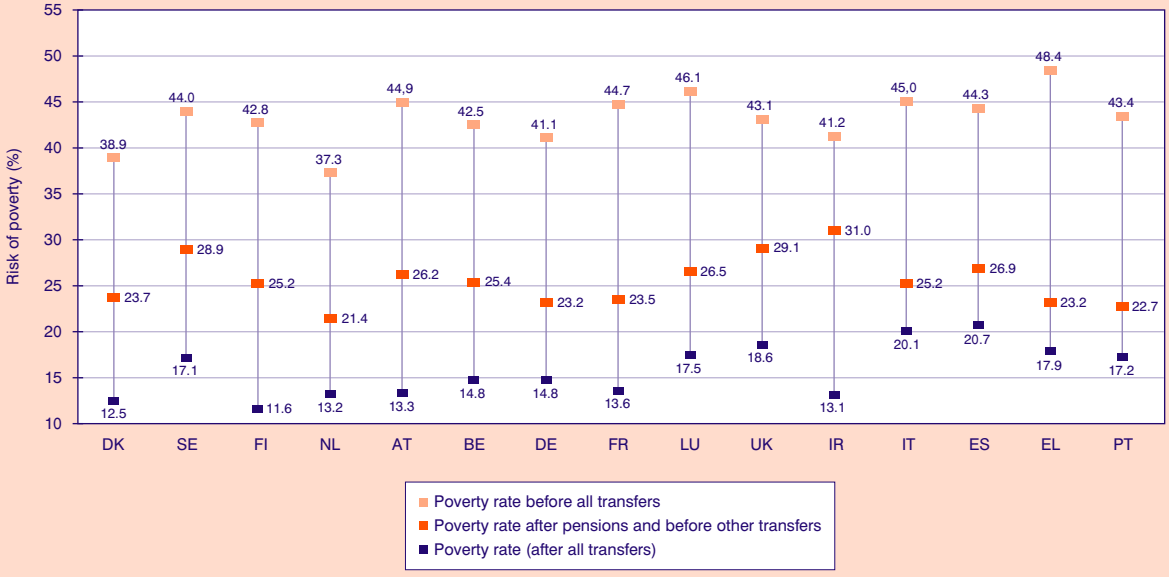
FIGURE 3.2.2
Income quintile share ratio, 2016 and 2018, EU15



Source: Eurostat, EUSILC.

* Years 2016 and 2017.

FIGURE 3.2.3
Poverty rate index before and after social transfers, 2018, EU15



Source: Eurostat, EUSILC.

* Years 2016 and 2017.

and other transfers have been realized. While Greece is estimated to have the highest poverty rate before transfers (48.4 %), at the same time, the impact of pensions seems to have been of utmost importance since the index is reduced by 25.2 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 17.9%, i.e., reduced by just 5.3 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 magnitude. 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. In general, in 2018, among the members of EU15, the average impact of pensions on the reduction of the poverty rate amounts to 17.7 percentage points while the corresponding contribution of the rest of the social transfers is lower and amounts, to 9.7 percentage points.

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 EU. The present article 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. Greece had the 3rd highest *Gini* index and the 6th highest income quintile share ratio. Furthermore, in Italy, Spain, Greece and Portugal, the role of pensions is of high importance, 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 2016 and 2018, in the countries of southern Europe, the distance between the upper and the lower quintiles of income was limited.

4. Reforms-Economic development

KEPE, *Greek Economic Outlook,* issue 45, 2021, pp. 58-69

4.1. Developments in Greece's exports of goods during the COVID-19 pandemic

Ersi Athanassiou
Agapi Kotsi

4.1.1. Introduction

In the case of the Greek economy, exports of goods have emerged over the past decade as the main demand component that shows the strongest resilience and the most favorable evolution in times dominated by adverse conditions. During the economic crisis, Greece's exports of goods showed significant and stable growth rates, helping to contain the decline in GDP and contributing to the rebalancing of external accounts. In the most recent conjuncture, where the world economy and international trade have been under the heavy impact of the Covid-19 pandemic, Greece has managed to strengthen its export activity in several of its main export products, thus largely offsetting the losses in certain major exporting sectors, most notably petroleum products.

The present section outlines the evolution of Greece's exports of goods under the conditions of the pandemic and highlights export sector characteristics related to the resilience of Greek exports under the current adverse conditions. The analysis summarises the effects of the pandemic on world merchandise trade so far, and records changes in Greece's goods exports in 2020, in total and compared to other European Union (EU) countries. Furthermore, the analysis examines export developments for Greece at the level of industries/products and destination countries, and identifies the main positive and negative changes that took place in the course of the pandemic. The data employed in the analysis comprise the most recent annual figures of the *National Accounts* (ELSTAT., Eurostat), as well as recent detailed annual export data from the UN Comtrade database.

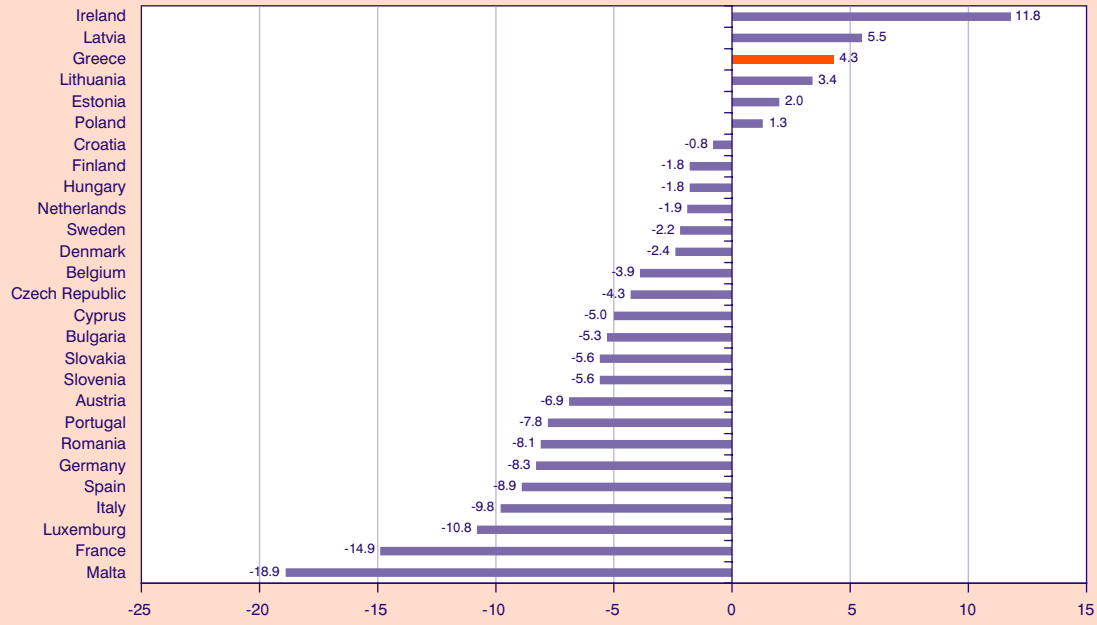
4.1.2. Effects of the pandemic on world merchandise trade and developments in total exports of goods in Greece and the EU

Developments in world merchandise trade during 2020 were inextricably linked to the evolution of the pandemic, the restrictions imposed to contain the spread of the Covid-19 virus and the measures implemented to support affected businesses and households. According to data from the World Trade Organization, the impact of the pandemic on international trade flows peaked in the second quarter of 2020, with the decline in world trade for the year as a whole amounting to 5.3%.

The direct effects of the pandemic on trade in goods in 2020 were linked to a number of phenomena which affected international demand and supply. In particular, the global recession and the wait-and-see attitude of consumers and investors led to a significant decline in international demand for goods, with the exception of some sectors that benefited from changing conditions (e.g., pharmaceuticals, medical supplies and equipment, IT equipment). In addition, the disruptions to production resulting from restrictive measures at the local, regional or national level, and the transmission of these disturbances from one country to the other through supply chain and value chain malfunctions, led to a dampening of the international supply of goods. At the same time, the decline in trade activity contributed to a fall in energy product prices –especially in the case of oil– while the application of stricter rules and controls in the context of dealing with the pandemic resulted in additional transportation costs.

In the EU, foreign trade in goods was significantly affected by the pandemic, with the effect on exports varying widely among member states. As illustrated in Figure 4.1.1, which shows the real rate of change of goods exports by EU country in 2020, based on *National Accounts* data, most member countries experienced a decline in total exports due to the pandemic. Notably, this decline was particularly sharp in major European economies, such as France, Germany, Italy and Spain, with the corresponding rates of change amounting to -14.9%, -8.3%, -9.8% and -8.9%, respectively. With reference to these countries, it seems that

FIGURE 4.1.1
Rate of change of exports of goods in EU countries, 2020 (constant prices, %)



Source: Eurostat.

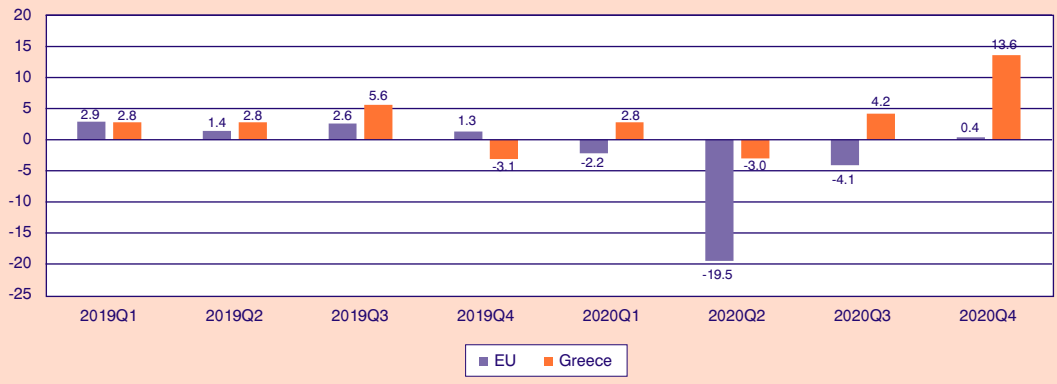
unfavorable export developments were linked not only to the adverse epidemiologic features of the first wave of the pandemic, but also to the structure of their exports, which is characterised by high shares of sectors such as the automotive industry, machinery and equipment, chemicals and metal products. These industries were severely hit by the pandemic due to a decrease in the demand for their products combined with their close links with production in other affected countries, as part of global value chains.

In this environment, Greece was one of the few EU economies that saw an increase in exports of goods in real terms during 2020. According to the provisional data of the *National Accounts,* this increase amounted to 4.3%, placing the country in the third position in the EU in terms of this rate. As illustrated in Figure 4.1.2, which shows the real quarterly rate of change of exports of goods in Greece and the EU, as compared to the corresponding quarters of the previous year, the impact of the pandemic on exports was felt in the second quarter of 2020 in Greece, with a relatively mild negative rate of change, while in the third and even more so in the fourth quarter of the year the country recorded significant export growth. In contrast, the EU experienced, on average, a decline in goods exports already from the first quarter, with the situation deteriorating rapidly in the second quarter, and a marginal recovery occurring towards the end of the year.

Greece's goods export performance in 2020 had a positive contribution of 0.8 percentage points to the yearly rate of change of GDP, thus limiting by this magnitude the corresponding depth of the recession experienced by the Greek economy in this period. As illustrated in Figure 4.1.3, which depicts the annual evolution of Greece's imports, exports and goods balance at constant prices, the pandemic did not prevent the country from keeping with its long-lasting real export growth trend, while reducing, with the assistance of a concurrent decline in imports, the goods deficit.

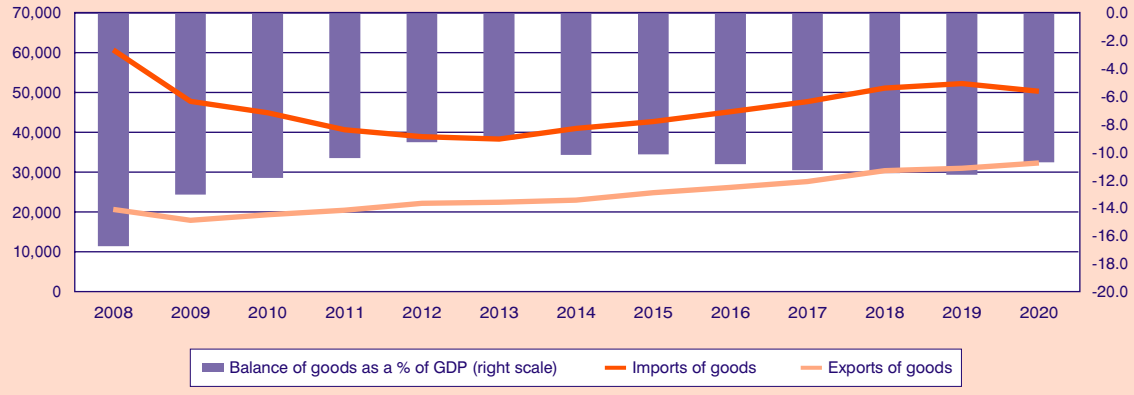
The evolution of Greece's merchandise exports in 2020 was linked to the country's successful response to the first epidemic wave, but was also largely related to the sectoral structure of Greek exports, combined with the use of certain opportunities by Greek export companies. As analyzed below, Greece benefited from its significant export activity, both in the category of agri-food products, which show relatively inelastic demand, and in other categories of goods, the needs for which increased due to the pandemic (e.g., medicines, certain food products).

FIGURE 4.1.2
Quarterly rate of change of exports of goods in Greece and the EU, as compared to the corresponding quarter of the previous year, 2020 (constant prices, %)



Source: Eurostat.

FIGURE 4.1.3
Greece's value of exports and imports of goods (million euros, 2015 constant prices) and balance of goods as a share of GDP (%)



Source: ELSTAT.

4.1.3. Developments in Greece's merchandise exports by sector/product

Table 4.1.1 presents the evolution of Greek merchandise exports in the top 30 two-digit sectors with the highest export value in year 2019, i.e., before the outbreak of the pandemic. The last row of the Table shows export developments in one more sector (68), which entered the corresponding top 30 in 2020, in the place of sector 64. The sectors listed in Table 4.1.1 can be considered as representing the core of Greece's export products, as in the years 2019 and 2020 they added up to 89.9% and 88.3% of the country's merchandise export value, respectively. Notably, the vast majority of the industries represented in the Table had shown significant export dynamics in the previous decade, a fact that probably contributed to the resilience of Greek merchandise exports in the course of the pandemic.

It is noted that the data in Table 4.1.1, which come from the United Nations UN Comtrade database, are expressed at current prices and therefore reflect developments not only in the volume, but also in the unit prices of exported products. As the pandemic affected significantly the price levels of certain goods –particularly the price of oil products, which represent

TABLE 4.1.1 Developments in Greece's exports in the top 30 two-digit sectors with the highest export value in years 2019 and 2020 (HS classification, current prices)

		Export value (million €)			Share in exports (%)			Change (%)	
		2008	2019	2020	2008	2019	2020	2019/08	2020/19
	Total exports	**21,156**	**33,842**	**30,747**	**100.0**	**100.0**	**100.0**	**60.0**	**-9.1**
27	Mineral fuels, mineral oils, products of their distillation, etc.	4,577	10,677	6,730	21.6	31.6	21.9	133.3	-37.0
30	Pharmaceutical products	875	1,933	2,884	4.1	5.7	9.4	120.8	49.2
84	Machinery, mechanical appliances, boilers, etc.	996	1,731	1,718	4.7	5.1	5.6	73.8	-0.7
76	Aluminium and articles thereof	1,009	1,703	1,614	4.8	5.0	5.3	68.7	-5.2
39	Plastics and articles thereof	881	1,172	1,167	4.2	3.5	3.8	33.1	-0.4
85	Electrical machinery and equipment, sound and image recorders and reproducers, etc.	964	1,131	1,227	4.6	3.3	4.0	17.4	8.5
20	Preparations of vegetables, fruit, nuts or other parts of plants	724	1,072	1,172	3.4	3.2	3.8	48.0	9.4
99	Commodities not elsewhere specified	562	967	427	2.7	2.9	1.4	72.1	-55.8
8	Edible fruit and nuts, etc.	666	954	1,132	3.2	2.8	3.7	43.2	18.7
4	Dairy produce, eggs, honey, etc.	278	693	808	1.3	2.0	2.6	149.2	16.7
	Total 10	**11,532**	**22,032**	**18,881**	**54.5**	**65.1**	**61.4**	**91.1**	**-14.3**
3	Fish, crustaceans, molluscs	455	671	728	2.1	2.0	2.4	47.7	8.5
74	Copper and articles thereof	568	644	627	2.7	1.9	2.0	13.4	-2.7
52	Cotton	383	569	430	1.8	1.7	1.4	48.6	-24.4
25	Salt, sulphur, earths, stone, plastering materials, lime, cement	357	568	439	1.7	1.7	1.4	58.9	-22.7
61	Articles of apparel and accessories, knitted or crocheted	630	568	422	3.0	1.7	1.4	-9.8	-25.7
72	Iron and steel	665	543	478	3.1	1.6	1.6	-18.4	-11.9
73	Articles of iron or steel	589	533	613	2.8	1.6	2.0	-9.5	15.1
24	Tobacco and manufactured tobacco substitutes	446	508	553	2.1	1.5	1.8	13.8	8.9
15	Animal or vegetable fats and oils, etc.	379	432	588	1.8	1.3	1.9	14.0	36.2
38	Miscellaneous chemical products	157	341	361	0.7	1.0	1.2	117.1	5.9
	Total 20	**16,160**	**27,408**	**24,119**	**76.4**	**81.0**	**78.4**	**69.6**	**-12.0**

TABLE 4.1.1 (continued)

90	Optical, photographic, cinematographic and measuring instruments, etc.	157	340	364	0.7	1.0	1.2	116.7	7.1
21	Miscellaneous edible preparations	117	318	348	0.6	0.9	1.1	172.2	9.5
62	Articles of apparel and accessories, not knitted or crocheted	211	316	229	1.0	0.9	0.7	49.8	-27.7
19	Preparations of cereals, flour, starch or milk, pastrycooks' products	155	288	330	0.7	0.9	1.1	86.1	14.5
33	Essential oils, perfumery, cosmetics	241	280	292	1.1	0.8	1.0	16.5	4.2
95	Toys, games and sports requisites	74	278	297	0.4	0.8	1.0	274.2	6.5
64	Footwear and the like, parts of such articles	71	254	179	0.3	0.8	0.6	257.2	-29.7
22	Beverages, spirits and vinegar	185	245	262	0.9	0.7	0.9	32.8	6.8
32	Tanning or dyeing extracts, tannins, dyes, pigments, etc.	142	236	253	0.7	0.7	0.8	66.1	7.2
48	Paper, paperboard and related products	137	222	256	0.6	0.7	0.8	61.5	15.4
	Total 30	**17,650**	**30,187**	**26,929**	**83.4**	**89.2**	**87.6**	**71.0**	**-10.8**
68	Articles of stone, plaster, cement, asbestos, mica, etc.	145	222	208	0.7	0.7	0.7	52.3	-6.2

Source: Own calculations based on UN Comtrade data, March 2021.

Note: The top 30 sectors in 2019 match the corresponding top 30 in 2020, in different order, except for sector 64, in the place of which entered in 2020 sector 68. The sectors, with the exception of sector 68, appear by order of export value in 2019.

TABLE 4.1.2 Developments in Greece's exports in the top 30 four-digit codes with the highest export value in years 2019 and 2020 (HS classification, current prices)

		Export value (million €)			Share in exports (%)			Change (%)	
		2008	2019	2020	2008	2019	2020	2019/08	2020/19
	Total exports	**21,156**	**33,842**	**30,747**	**100.0**	**100.0**	**100.0**	**60.0**	**-9.1**
2710	Petroleum oils and oils obtained from bituminous minerals, excluding crude, etc.	4,280	9,862	6,088	20.2	29.1	19.8	130.4	-38.3
3004	Medicaments consisting of mixed or unmixed products for retail sale	843	1,847	2,794	4.0	5.5	9.1	119.1	51.3
9999	Commodities not elsewhere specified	562	967	834	2.7	2.9	2.7	72.1	-13.8
8471	Automatic data-processing machines (PCs), etc.	59	676	606	0.3	2.0	2.0	1045.8	-10.4
7606	Plates, sheets and strip, of aluminium, of a thickness of > 0.2 mm	397	639	586	1.9	1.9	1.9	61.0	-8.3
5201	Cotton, neither carded nor combed	226	526	398	1.1	1.6	1.3	132.7	-24.4
0302	Fish, fresh or chilled, excluding those of heading 304	375	519	562	1.8	1.5	1.8	38.4	8.3
2005	Vegetables prepared or preserved otherwise than by vinegar or acetic acid, not frozen	220	502	528	1.0	1.5	1.7	128.2	5.2
0406	Cheese and curd	207	466	526	1.0	1.4	1.7	125.1	13.0
7411	Copper tubes and pipes	288	459	460	1.4	1.4	1.5	59.4	0.3
	Total 10	**7,457**	**16,462**	**13,383**	**35.2**	**48.6**	**43.5**	**120.8**	**-18.7**
2713	Petroleum coke, petroleum bitumen, etc.	105	387	350	0.5	1.1	1.1	268.6	-9.6
7604	Bars, rods and profiles, of aluminium, n.e.s.	148	359	365	0.7	1.1	1.2	142.6	1.7
1509	Olive oil and its fractions obtained solely by mechanical means	268	351	493	1.3	1.0	1.6	31.0	40.5
2008	Fruits, nuts, etc., prepared or preserved	312	336	391	1.5	1.0	1.3	7.7	16.3
8544	Insulated wire, cable and other insulated conductors, optical fiber cables	269	327	292	1.3	1.0	1.0	21.6	-10.6
7607	Aluminium foil of a thickness of < 0.2 mm	106	323	321	0.5	1.0	1.0	204.7	-0.7
2515	Marble, travertine, ecaussine and other calcareous building stone	54	248	168	0.3	0.7	0.5	359.3	-32.2
2106	Food preparations, n.e.s.	85	243	275	0.4	0.7	0.9	185.9	13.4
7601	Unwrought aluminium	179	229	202	0.8	0.7	0.7	27.9	-11.7
2711	Petroleum gas and other gaseous hydrocarbons	157	227	194	0.7	0.7	0.6	44.6	-14.4
	Total 20	**9,139**	**19,492**	**16,435**	**43.2**	**57.6**	**53.5**	**113.3**	**-15.7**

TABLE 4.1.2 (continued)

0810	Fresh strawberries, raspberries, blackberries, currants, etc.	54	216	259	0.3	0.6	0.8	300.0	20.1
9503	Tricycles, scooters, dolls, recreational models and other toys	31	215	220	0.1	0.6	0.7	593.5	2.4
3902	Polymers of propylene or of other olefins, in primary forms	173	215	182	0.8	0.6	0.6	24.3	-15.3
2523	Cement	199	197	158	0.9	0.6	0.5	-1.0	-19.8
7213	Bars and rods of iron or non-alloy steel	47	196	191	0.2	0.6	0.6	317.0	-2.4
2402	Cigars, cheroots, cigarillos and cigarettes of tobacco or of tobacco substitutes	164	189	225	0.8	0.6	0.7	15.2	19.1
7305	Tubes and pipes, circular with a diameter of > 406.4 mm, of iron or steel	101	187	255	0.5	0.6	0.8	85.1	36.2
0805	Citrus fruit, fresh or dried	151	183	242	0.7	0.5	0.8	21.2	32.0
0403	Buttermilk, curdled milk and cream, yogurt, kephir, etc.	58	176	209	0.3	0.5	0.7	203.4	18.5
2403	Manufactured tobacco and manufactured tobacco substitutes, etc.	1	176	162	0.0	0.5	0.5	17,500.0	-8.0
	Total 30	**10,117**	**21,442**	**18,538**	**47.8**	**63.4**	**60.3**	**111.9**	**-13.5**
8517	Telephone sets	193	168	197	0.9	0.5	0.6	-12.8	17.1
0809	Apricots, cherries, peaches, plums	147	140	195	0.7	0.4	0.6	-4.8	39.3
3920	Plates, sheets, film, foil and strip, of non-cellular plastics	145	164	179	0.7	0.5	0.6	12.6	9.7

Source: Own calculations based on UN Comtrade data, March 2021.

Note: The top 30 codes in 2019 match the corresponding top 30 in 2020, in different order, except for categories 2515, 2523, 2403, in the place of which entered in 2020 categories 8517, 0809, 3920. The categories, except for the last three, appear by order of export value in 2019.

Greece's largest merchandise export sector– data at current prices provide a different picture as to the overall change in Greek exports in 2020, compared to data at constant prices. In particular, the sharp drop in the price of oil, and the resulting strong impact on the unit price of petroleum products, was largely responsible for the observed decline in exports of the corresponding sector (27) by 37.0% or 3.9 billion euros at current prices in 2020. In turn, this particularly unfavorable development in the oil sector dragged Greece's total exports of goods at current prices to a fall of 9.2%.

In contrast to the adverse developments in oil products, Greece's non-oil exports showed an increase in year 2020, amounting to 3.7% at current prices. Out of the 31 sectors listed in Table 4.1.1, a total of 18 experienced a rise in export value in 2020, with the most impressive increase (49.2%) being recorded in the pharmaceutical products sector (30). Export growth was also considerable in the electrical machinery and equipment sector (85), while in the agri-food sector all nine two-digit categories included in Table 4.1.1 showed an increase in export value ranging from 6.8% to 36.2%. From the remaining sectors of the Table, positive export growth was also observed in the categories of iron or steel (73), miscellaneous chemical products (38), optical, photographic, cinematographic and measuring instruments, etc. (90), essential oils, perfumery and cosmetics (33), toys, games and sports requisites (95), tanning or dyeing extracts, tannins, dyes, pigments, etc. (32) and paper, paperboard and related products (48).

For a more detailed account of developments in Greece's foremost export products, Table 4.1.1 presents the evolution of merchandise exports in the top 30 four-digit HS product codes with the highest export value in year 2019. The last row of the Table shows export developments in three more product categories (8517, 0809, 3920), which entered the corresponding top 30 in 2020, in the place of categories 2515, 2523, 2403. The sectors listed in Table 4.1.2 added up to 64.8% and 62.1% of the country's merchandise export value in years 2019 and 2020, respectively.

The data in Table 4.1.2 confirm the large decline in exports of petroleum products, but also the positive development of exports in all major export products of the Greek agri-food sector, and in particular fresh fish, preparations of vegetables, fruits, etc., cheese, olive oil, yogurt, tobacco products and fresh fruit. In addition, the Table shows the major rise in exports in the category of medicines for retail sale, and the increase in exports in product codes referring to copper, iron or steel pipes, toys, telephone sets and plastic plates, sheets, etc.

At the time of writing the article, the value of Greek merchandise exports in 2020 was available up to the level of six-digit codes of the HS classification, enabling an even more detailed picture in relation to the products that contributed to the resilience of exports against the pandemic conditions. The analysis of these data shows that the product with the largest increase in exports in absolute terms (889 million euros) comes from the category of pharmaceuticals, followed by virgin olive oil (increase of 139 million euros). Among the products of the agri-food sector, the largest increases in exports by value in absolute terms were recorded, apart from olive oil, in the categories of cheeses, oranges, sea breams, canned peaches, cigarettes, yogurt, food preparations n.e.s., kiwis, cherries, peaches, olives, pastry mixes and strawberries. Concerning other product categories, the largest increases were recorded in passenger ships, turbine engines, iron or steel pipes, ores and concentrates of precious metals, bars and aluminum alloys and automatic information processing machines.

On the other hand, the largest reductions in exports were recorded, in addition to petroleum products, in raw cotton, marble, clothing, portable computers, electrical energy and plates, films and aluminum foil. It is noted that in the case of portable computers, the decline in exports is most likely associated with increased domestic demand and the consequent greater domestic absorption of production, due to the needs arising from teleworking and distance learning. In contrast, in the case of industries such as cotton, clothing and marble, the drop in exports reflects a decline in external demand due to the conditions caused by the pandemic.

4.1.4. Developments in Greece's merchandise exports by geographical destination

Developments in Greek exports in 2020 have varied widely not only between sectors, but also between geographical destinations, with the country's trade relationship with specific geographical areas and destinations seeming to have contributed to its resilience against the pandemic conditions.

Table 4.1.3 shows the value of Greece's merchandise exports towards the geographic regions of Europe, the Middle East, South and Central Asia, Africa, the Americas and Oceania, as well as the percentage change in the country's exports per region in year 2020. It seems that a large part of Greece's exports of goods is directed to Europe, with the Eurozone first in order of value, followed by the rest of the EU and other European countries. Greece's exports to the Eurozone remained stable in 2020, while exports to other EU countries increased by 6.0%, with these developments providing significant support to the country's export sector.

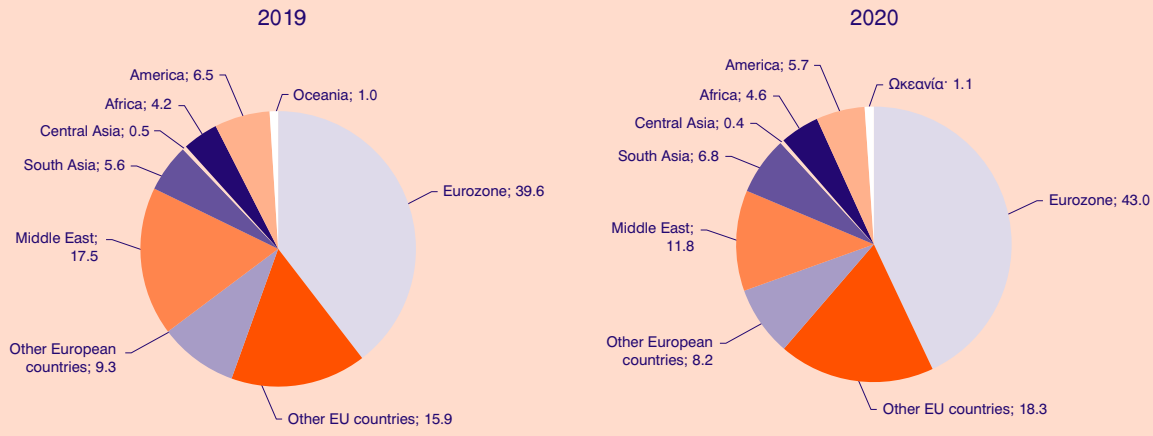
TABLE 4.1.3 Greece's merchandise exports by geographic region in years 2019 and 2020, and percentage change in year 2020 (current prices)

Geographic region	Export value (million €)		Change (%)
	2019	2020	2020/2019
Eurozone	13,205	13,213	0.1
Other EU countries	5,316	5,633	6.0
Other European countries	3,092	2,522	-18.4
Middle East	5,825	3,631	-37.7
South Asia	1,884	2,094	11.2
Central Asia	156	136	-12.9
Africa	1,399	1,420	1.5
America	2,168	1,754	-19.1
Oceania	332	330	-0.5

Source: Own calculations based on UN Comtrade data, March 2021.

Note: Egypt has been included in the Middle East region, not Africa.

FIGURE 4.1.4
Shares in Greece's merchandise exports by geographic region (%)



Source: Own calculations based on UN Comtrade data, March 2021.

Among the other geographic regions, exports to South Asia and Africa also increased. On the other hand, a significant decline was recorded in 2020 in export activity towards the Middle East and non-EU European countries, while exports to the United States also declined. It is noted that the observed resilience of Greek exports towards the EU is related to the higher degree of diversification (i.e., the greater product variety) of the country's exports to this region, while the large decline in exports to the Middle East and non-EU European countries is associated with the high share of the affected oil sector in Greece's exports to these areas.

As expected, the differences in Greece's export performance between geographic regions after the outbreak of the pandemic had an impact, even temporarily, on the geographical structure of the country's exports. As shown in Figure 4.1.4, the Eurozone's share in ex-

TABLE 4.1.4 Developments in Greece's exports in the top 30 countries with the highest export value from Greece in years 2019 and 2020

Country	Export value (million €)			Share in exports (%)			Change (%)	
	2008	2019	2020	2008	2019	2020	2019/08	2020/19
Total	**21,156**	**33,842**	**30,747**	**100.0**	**100.0**	**100.0**	**60.0**	**-9.1**
Italy	2,168	3,653	3,262	10.2	10.8	10.6	68.5	-10.7
Germany	2,049	2,250	2,393	9.7	6.6	7.8	9.8	6.3
Turkey	903	1,974	1,339	4.3	5.8	4.4	118.5	-32.2
Cyprus	1,327	1,900	1,985	6.3	5.6	6.5	43.2	4.5
Bulgaria	1,371	1,560	1,535	6.5	4.6	5.0	13.8	-1.6
United States of America	1,110	1,305	1,137	5.2	3.9	3.7	17.6	-12.9
United Kingdom	955	1,225	1,184	4.5	3.6	3.9	28.3	-3.3
France	731	1,184	1,784	3.5	3.5	5.8	62.0	50.7
Lebanon	87	1,162	650	0.4	3.4	2.1	1237.2	-44.1
Spain	551	1,104	1,140	2.6	3.3	3.7	100.4	3.3
10 countries	**11,251**	**17,317**	**16,409**	**53.2**	**51.2**	**53.4**	**53.9**	**-5.2**
Romania	833	1,014	1,118	3.9	3.0	3.6	21.7	10.3
Egypt	146	943	498	0.7	2.8	1.6	547.2	-47.2
China	135	892	858	0.6	2.6	2.8	562.8	-3.9
North Macedonia	456	794	540	2.2	2.3	1.8	74.1	-32.0
Saudi Arabia	122	748	296	0.6	2.2	1.0	512.5	-60.5
Netherlands	472	699	698	2.2	2.1	2.3	48.0	-0.1
Albania	548	573	510	2.6	1.7	1.7	4.6	-10.9
Slovenia	254	521	322	1.2	1.5	1.0	105.3	-38.2
Poland	241	495	578	1.1	1.5	1.9	105.8	16.7
Belgium	246	479	390	1.2	1.4	1.3	95.0	-18.6
20 countries	**14,702**	**24,475**	**22,216**	**69.5**	**72.3**	**72.3**	**66.5**	**-9.2**
Israel	154	472	371	0.7	1.4	1.2	207.1	-21.3
State of Libya	134	403	638	0.6	1.2	2.1	200.5	58.3
Malta	225	329	250	1.1	1.0	0.8	46.1	-24.2
Serbia	299	324	323	1.4	1.0	1.1	8.3	-0.2
Austria	157	292	349	0.7	0.9	1.1	86.2	19.7
Czech Republic	129	262	261	0.6	0.8	0.8	103.9	-0.6
United Arab Emirates	272	253	235	1.3	0.7	0.8	-6.9	-7.3
Sweden	193	214	192	0.9	0.6	0.6	10.9	-10.1
Ukraine	126	211	193	0.6	0.6	0.6	66.9	-8.6
Russia	428	209	161	2.0	0.6	0.5	-51.3	-22.7
30 countries	**16,819**	**27,443**	**25,189**	**79.5**	**81.1**	**81.9**	**63.2**	**-8.2**

TABLE 4.1.4 (continued)

Country	Export value (million €)			Share in exports (%)			Change (%)	
	2008	2019	2020	2008	2019	2020	2019/08	2020/19
Japan	89	190	355	0.4	0.6	1.2	113.7	86.4
Korea	30	157	335	0.1	0.5	1.1	429.2	113.5
Croatia	194	148	288	0.9	0.4	0.9	-23.3	94.4
Hungary	116	206	251	0.6	0.6	0.8	77.0	21.8

Source: Own calculations based on UN Comtrade data, March 2021.

Note: The countries listed, except for the last four, appear by order of Greece's export value in 2019.

ports strengthened significantly, from 39.6% in 2019 to 43.0% in 2020, while a corresponding increase from 15.9% to 18.3% was recorded in the share of other EU countries. The corresponding share of South Asia increased moderately (from 5.6% to 6.8%), while significant reductions were recorded in the shares of the Middle East (from 17.5% to 11.8%) and non-EU European countries (from 9.3% to 8.2%).

Table 4.1.4 presents export developments and shares in total Greek merchandise exports for the top 30 countries with the highest export value from Greece in years 2019 and 2020. The last four rows of the Table also show the course of the country's exports to Japan, South Korea, Croatia and Hungary, countries that entered the top 30 in 2020, in the place of the United Arab Emirates, Sweden, Ukraine and Russia. The countries listed in Table 4.1.4 absorbed a total of 83.2% and 85.9% of Greece's goods exports in years 2019 and 2020, respectively.

Among the countries listed in Table 4.1.4, 12 recorded an increase in their imports from Greece in 2020. In particular, Greek exports showed a large increase of 50.7% or 600.4 million euros in the case of France, while they increased more than 100 million euros in the cases of Libya, South Korea, Japan, Germany, Croatia and Romania. It is interesting to note that for these destinations, the increase in Greek exports came largely from the trade activity of a limited number of individual export sectors. In particular, the increase in exports concerned mainly the pharmaceutical sector in the cases of France and Japan; the petroleum sector in Libya, South Korea and Croatia; the dairy, fruit, other agri-food products and machinery sectors in Germany; and the sectors of cast iron, iron and steel and their products, fruit and toys in Romania.

In relation to the destinations to which Greece showed a decline in exports during 2020, the largest reductions in absolute terms concerned Turkey, Saudi Arabia, Italy, Northern Macedonia, Lebanon, Slovenia, the USA and Israel. Notably, to a large extent, these reductions were related to the petroleum sector.

4.1.5. Conclusions and prospects

As shown in the above analysis, Greece's merchandise exports sector exhibited a considerable degree of resilience to the highly unfavourable international environment caused by the Covid-19 pandemic. Greece achieved a 4.2% increase in goods exports in real terms during year 2020, and was one of the few EU economies to have shown positive performance in this respect, in the course of this particularly difficult conjuncture. At the same time, at current prices, the decline observed in Greece's merchandise exports came mainly from the fall in demand and prices in the oil sector, with the country's non-oil exports having increased by 3.7%. These results were linked to the country's successful response to the first epidemic wave, but were also largely related to the structure of Greek exports, mainly in terms of product composition, but also with regard to geographical destinations. Greece benefited from its significant export activity in the category of agri-food products, which show relatively inelastic demand, but also in other categories of goods, such as pharmaceutical products, the needs for which increased due to the pandemic. At the same time, the resilience of Greece's exports was enhanced by the high share and the relatively high degree of differentiation (variety) of the products exported by Greece to the the EU, as well as by the expansion of

the country's export trade to the markets of Southeast Asia in the previous years.

In relation to the prospects of Greece's merchandise exports for 2021, developments in the international environment are expected to create more favorable conditions for export growth, although the uncertainties related to the course of the pandemic still complicate significantly any assessment. Based on the indications so far, the European and world economies are expected to recover partially this year, boosting international trade in goods. At the same time, the needs for pharmaceutical products are expected to remain high, while oil prices have increased compared to the previous year, a development which, combined with increased demand in this market, is expected to enhance Greece's exports of petroleum products.

KEPE, *Greek Economic Outlook,* issue 45, 2021, pp. 70-73

4.2. External trade of agro-food products

Athanasios Chymis

4.2.1. Greece's overall external trade

The year 2020 will probably be remembered for the coronavirus pandemic and the ensuing economic crisis, which in many cases, especially in developed countries, has become the worst crisis since World War II. The Greek economy suffered a significant decrease in GDP. However, while this decrease was accompanied by the expected decline of imports (due not only to lower demand caused by the lockdowns, but also the reduced income for a significant portion of workers), exports (excluding petroleum products) increased.

Table 4.2.1 shows that in 2020, total imports and exports (including petroleum products) decreased significantly, by 12.5% and 9.2%, respectively. However, if we remove the petroleum products, which are an important part of Greek foreign trade, imports decreased by 4.1% (or €1.68 billion) while exports increased by 3.6% (or €0.84 billion). This led to a reduction of the total trade deficit by 17.8% (a €1.36 billion decrease in petroleum products and €2.52 billion in other goods, totaling €3.88 billion). It is noted that the large decrease in the trade of petroleum products (imports by 35.3% and exports by 37.0%) was mostly due to the significant price decline for oil.

TABLE 4.2.1 Total exports of goods and agro-food products (in billion €)

	2008	2011	2014	2017	2018	2019	2020	% change 2019-2020
				Imports				
Total imports	60.72	43.27	47.73	50.26	55.19	55.68	48.69	-12.5
Petroleum products imports	12.12	11.62	16.07	12.21	15.99	15.01	9.71	-35.3
Total except petroleum products	48.60	31.65	31.66	38.05	39.20	40.67	38.99	-4.1
Agro-food products	**7.05**	**6.46**	**6.49**	**7.00**	**7.05**	**7.31**	**6.65**	**-9.0**
Agro-food %	*14.5*	*20.4*	*20.5*	*18.4*	*18.0*	*18.0*	*17.1*	
				Exports				
Total exports	17.36	22.45	27.19	28.83	33.46	33.85	30.74	-9.2
Petroleum products exports	1.90	6.30	10.35	8.97	11.48	10.68	6.73	-37.0
Total except petroleum products	15.46	15.88	16.84	19.86	21.97	23.17	24.01	3.6
Agro-food products	**4.01**	**4.50**	**5.18**	**6.10**	**6.49**	**6.61**	**7.18**	**8.6**
Agro-food %	*25.9*	*28.4*	*30.7*	*30.7*	*29.6*	*28.5*	*29.9*	
				Trade balance				
Total balance	-43.36	-20.82	-20.55	-21.43	-21.73	-21.84	-17.96	-17.8
Excluding petroleum products	-33.14	-15.77	-14.82	-18.18	-17.23	-17.50	-14.98	-14.4
Agro-food	**-3.04**	**-1.96**	**-1.31**	**-0.90**	**-0.55**	**-0.70**	**0.52**	*

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

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

4.2.2. Agro-food products trade

If 2020 remains in Greek economic history as a bad year in general, this is not the case with the agricultural sector, which has continued to show resilience and dynamism during the COVID-19 crisis, as it did during the last economic crisis. So, in 2020, for the first time in several decades, the trade balance of agri-food products is a surplus. This is due to the significant reduction of agri-food imports by 9% (or €660 million) and, at the same time, the impressive increase of exports by 8.6% (or €568 million), which, for the first time, exceeded the barrier of €7 billion, setting a new record.

Indicative of the dynamic course of agri-food exports is the fact that the cumulative increase in exports since 2008 reached 79%, while agri-food imports have not changed significantly during the same period. Thus, the record deficit of €3 billion in 2008, which in recent years had been reduced and ranged between €0.5 and €1 billion, disappeared in 2020, giving way to a surplus of €524 million. We know that agri-food products are inelastic, which means that any change in income affects the imports of industrial rather than agri-food products. The significant decline in agri-food imports in 2020 can be attributed to the special characteristics of the pandemic, namely the lockdowns that mostly affected hotel, catering and, entertainment services (*i.e.:* sectors involving the consumption of important agro-food products).

Table 4.2.2 presents the evolution of the imports of all basic categories of agri-food products. Specifically, it

TABLE 4.2.2 Imports of agro-food products categories, in million € (M €)

	2008		2011		2014		2017		2018		2019		2020	
	M €	%	M €	%	M €	%	M €	%	M €	%	M €	%	M €	%
Meat products [a]	1,211	17.2	1,171	18.1	1,162	17.9	1,242	17.7	1,242	17.6	1,322	18.1	**1,132**	**17.0**
Dairy	808	11.5	812	12.6	842	13.0	856	12.2	829	11.8	857	11.7	**819**	**12.3**
Fruits-Vegetables	786	11.1	702	10.9	663	10.2	812	11.6	827	11.7	900	12.3	**817**	**12.3**
Cereals	681	9.7	655	10.1	532	8.2	673	9.6	682	9.7	707	9.7	**664**	**10.0**
Feeding stuff	406	5.8	355	5.5	403	6.2	407	5.8	462	6.6	487	6.7	**548**	**8.2**
Coffee, tea, etc.	365	5.2	409	6.3	442	6.8	425	6.1	453	6.4	470	6.4	**436**	**6.6**
Fish	428	6.1	414	6.4	378	5.8	489	7.0	521	7.4	540	7.4	**423**	**6.4**
Various foodstuff	344	4.9	331	5.1	367	5.7	347	5.0	358	5.1	374	5.1	**376**	**5.7**
Tobacco	335	4.7	247	3.8	236	3.6	305	4.4	347	4.9	327	4.5	**286**	**4.3**
Beverages	436	6.2	308	4.8	248	3.8	318	4.5	309	4.4	328	4.5	**235**	**3.5**
Oils and fats	290	4.1	255	3.9	274	4.2	291	4.2	256	3.6	226	3.1	**224**	**3.4**
Sugars	225	3.2	259	4.0	227	3.5	251	3.6	196	2.8	203	2.8	**209**	**3.1**
Oil seeds	224	3.2	175	2.7	220	3.4	203	2.9	202	2.9	204	2.8	**186**	**2.8**
Raw materials	130	1.8	112	1.7	121	1.9	142	2.0	140	2.0	140	1.9	**134**	**2.0**
Wood	262	3.7	121	1.9	118	1.8	127	1.8	140	2.0	147	2.0	**132**	**2.0**
Hides-skins	93	1.3	97	1.5	116	1.8	86	1.2	62	0.9	56	0.8	**14**	**0.2**
Total	**7,054** [b]		**6,461**		**6,488**		**6,998**		**7,047**		**7,313**		**6,653**	

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.

shows the evolution of import values at current prices as well as the share of each category in the total imports of agri-food products. Import values of feeding stuff, sugars and various foodstuffs increased in 2020 by 12.5%, 3% and 0.5%, respectively. Part of this increase is due to the increase in the per unit price of imported quantities. In the case of foodstuffs, the imported quantity decreased, but the increase in prices led to an increase in the final import value.

Import values for all other categories declined. Specifically, hides-skins declined by 75%, a small part of which is due to falling prices; beverages declined by 28.6%, a significant part of which is due to lower prices; fish lost 21.7% of its import value, a small part of which is due to falling prices; meat products declined by 14.5%, a small part of which is due to falling prices; tobacco lost 12.7%, most of which is due to lower prices; wood lost 10.1%, partly due to lower prices; fruit and vegetables declined by 9.3% despite the slight increase in prices; and oil seeds lost 8.8% despite the significant rise in prices. Raw materials and oils-fats had a relatively small decrease in their import value due to the significant rise in prices, which partially offset the decrease in imported quantities. It becomes clear that the pandemic, through the lockdowns and the subsequent closure of restaurants, bars, hotels, etc., significantly affected the consumption of several agri-food items.

Regarding exports, fruits and vegetables had an impressive increase of 11.5% –a small part of which is

TABLE 4.2.3 Exports of agro-food products categories, in million € (M €)

	2008		2011		2014		2017		2018		2019		2020	
	M €	%	M €	%	M €	%	M €	%	M €	%	M €	%	M €	%
Fruits-Vegetables	1,346	33.6	1,519	33.7	1,826	35.3	1969	32.3	2,086	32.1	2,175	32.9	**2,425**	**33.8**
Dairy	275	6.9	322	7.1	483	9.3	634	10.4	672	10.3	705	10.7	**805**	**11.2**
Fish	449	11.2	604	13.4	556	10.7	674	11.0	689	10.6	684	10.3	**728**	**10.1**
Oils and fats	333	8.3	299	6.6	322	6.2	570	9.3	704	10.8	421	6.4	**570**	**7.9**
Tobacco	416	10.4	370	8.2	386	7.5	484	7.9	489	7.5	508	7.7	**550**	**7.7**
Cereals	315	7.9	311	6.9	338	6.5	361	5.9	402	6.2	422	6.4	**467**	**6.5**
Cotton	236	5.9	251	5.6	310	6.0	355	5.8	342	5.3	530	8.0	**397**	**5.5**
Various foodstuff	124	3.1	188	4.2	221	4.3	282	4.6	307	4.7	338	5.1	**376**	**5.2**
Beverages	163	4.1	195	4.3	198	3.8	222	3.6	223	3.4	229	3.5	**235**	**3.3**
Meat products[a]	76	1.9	87	1.9	84	1.6	109	1.8	125	1.9	145	2.2	**138**	**1.9**
Feeding stuff	51	1.3	42	0.9	58	1.1	61	1.0	80	1.2	88	1.3	**120**	**1.7**
Oil seeds	76	1.9	66	1.5	86	1.7	75	1.2	76	1.2	76	1.1	**101**	**1.4**
Coffee, tea, etc.	30	0.7	43	1.0	60	1.2	80	1.3	80	1.2	86	1.3	**86**	**1.2**
Sugars	54	1.3	116	2.6	71	1.4	96	1.6	91	1.4	76	1.1	**75**	**1.0**
Raw materials	18	0.4	23	0.5	34	0.7	46	0.8	51	0.8	54	0.8	**58**	**0.8**
Hides-skins	38	0.9	54	1.2	64	1.2	73	1.2	63	1.0	56	0.8	**30**	**0.4**
Wood	9	0.2	9	0.2	10	0.2	10	0.2	11	0.2	13	0.2	**12**	**0.2**
Total	**4,011**[b]		**4,505**		**5,176**		**6,103**		**6,493**		**6,609**		**7,177**	

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.

due to rising prices– reaching an export value of €2.43 billion and expanding their share in total exports to 33.8%. Exports of dairy products continued their dynamic course, increasing by 14.2% –a small part of which is due to rising prices– and earning the second place regarding their share (11.2%), behind fruits and vegetables. Although fish export quantities marginally decreased (-0.9%), the significant increase in fish prices led to an increase in export value by 6.4%. For oils and fats (olive oil being the main product), export values increased, but the falling prices partially offset the significant export quantity increase.

Among the other agro-food categories, those that had a significant increase in their export value are feeding stuff by 36.2%, a small part of which is due to rising prices; oil seeds by 32.7%, a small part of which is due to price increases; various foodstuffs by 11.5%, which is almost entirely due to rising prices; cereals by 10.7%, partly due to rising prices; tobacco by 8.4%, a small part of which is due to rising prices; and raw materials by 8.2%, which is purely due to significant price increases, as export volumes fell by 13.1%.

On the contrary, some agro-food categories had a decrease in their export value, such as hides-skins by 47.4%, most of which is due to falling prices; cotton by 25%, part of which is due to falling prices; wood by 12.2%, entirely due to falling prices and despite the increase in exported quantities, and meat products by 4.8%, mainly due to lower prices. Finally, in the case of sugars, the rise in prices almost offset the significant decline in export quantity (-25.4%), as was also the case for coffee, tea etc., the export quantity of which decreased by 7.4%.

4.2.3. Concluding remarks

Beyond a health crisis, the coronavirus pandemic has brought a significant economic crisis, with the recession in Greece in 2020 comparing to the recession of the worst financial years of the 2009-2016 economic crisis. This is a setback for the Greek economy as it has not been long since it emerged from the great economic crisis. Moreover, the Greek economy for the previous 2-3 years has only made some timid growth steps, and it needs to substantially accelerate its growth rate.

Although foreign trade was significantly affected by the pandemic, its resilience in terms of exports is a very positive sign. Exports are a key driver for growth. The continuous and long-lasting lockdowns significantly reduced domestic demand as well as touristic demand due to the dramatic decline of visitors. Thus, imports of non-petroleum products decreased by 4.1%, and those of agri-food by 9%, an amount comparable only to the decrease observed in 2009, the first year of the Greek economic crisis and a year of the international financial crisis. But then the decline in total imports of non-petroleum products was much greater and reached 15.85%. The proportionately more adverse effect of the pandemic on the agri-food sector is clear due to the drastic restrictions on social events (catering, entertainment) and tourism worldwide.

Despite the corresponding decrease in demand internationally, exports of Greek non-petroleum products increased by 3.6%, while exports of agri-food products grew by an impressive 8.6%. Combined with a 9% drop in agro-food imports, the agro-food trade balance in 2020 has a surplus for the first time in more than 30 years. While this fact is very positive, it should be noted that this result was achieved due to the large reduction in imports. The increase in exports alone (€568 million) would not have been enough to turn the deficit (€704 million in 2019) into a surplus, although it would have greatly reduced it. This means that for a sustainable surplus in the agro-food trade balance, agri-food exports must continue the dynamic growth of recent years at an accelerating pace. As this column repeatedly points out, the development of the livestock sector, among other sectors, has the potential to make a significant contribution to creating a sustainable trade surplus. The livestock sector has, by far, the greatest deficit. If domestic production contributes to reducing even a small fraction of livestock imports or increasing livestock exports, the agro-food trade balance could become sustainably positive.

KEPE, *Greek Economic Outlook,* issue 45, 2021, pp. 74-79

4.3. Economic output and human losses in Greece during the pandemic

Pródromos Prodromídis

4.3.1. Introduction

The article looks into the evolution of the quarterly gross domestic product (GDP) figures and of the weekly mortality figures in Greece, in relation to other European states during the SARS-CoV-2 pandemic, from the first quarter of 2020 (2020^{Q1}) to the first quarter of 2021 (2021^{Q1}),[1] with the aim of describing what happened, and assessing the country's performance in terms of economic output and human losses.

To that end, the weekly mortality figures are converted to quarterly numbers so as to match the GDP time-series, and both sets of quarterly figures are: (a) Reshaped into indices through division with the respective (pre-pandemic) quarterly figures of 2019, (b) Compared to the corresponding indices relating to the other EU member states (except for the Republic of Ireland for which the data are incomplete), and to six neighboring states for which Eurostat provides reliable, comparable data for three or more quarters. The neighboring states are Albania, Iceland, Norway, Serbia, Switzerland, and the United Kingdom.

The rationale is as follows: While monitoring and comparing country performances during the pandemic is often based on the number of infected people or on the number of confirmed virus-related deaths (e.g., NPHO;[2] Middelburg and Rosendaal, 2020; WHO, 2021), (a) the former may not be suitable for comparisons if the tests are not performed on representative samples or in similar manners etc., and (b) the latter may be misleading if deaths from other causes are underestimated or neglected due to the pressure placed on the health systems by the pandemic. As a result, it may be more appropriate to engage in comparisons based on the total number of deaths or in terms of the *additional deaths* that occur in relation to a pre-pandemic year (e.g., by ECDC, 2020; Karanikolos and McKee, 2020; Amoretti and Lalumera, 2021; Lau et al., 2021). Furthermore, it may be useful to take into consideration how economic activity unfolded as: (i) The govern-

TABLE 4.3.1 The cumulative number of confirmed SARS-CoV-2 deaths in Greece at the end of 2020^{Q2}, of 2020^{Q4} and of 2021^{Q1}

	Deaths per 100,000 people	Rank based on the figures submitted by the various countries to the WHO
End of 2020^{Q2}: After the 1st wave of the pandemic in Greece.	1.8	4th lowest in the EU-27
End of 2020^{Q4}: Near the end of the 2nd wave of the pandemic in Greece	43.7	8th lowest in the EU-27
End of 2021^{Q1}: Amid the 3rd wave of the pandemic in Greece	75.1	5th lowest in the EU-27

Source: WHO (2020a, 2020b, 2021). Own calculations.

Note: WHO reports on the issue used to be occasional, but became weekly from October 2020 onwards.

1. All sets of data used in the Figures are collected and provided by Eurostat. The data are available up to 2021^{Q1}.

2. The daily reports of the National Public Health Organization (https://eody.gov.gr/en/npho) are available via the Greek site: <https://eody.gov.gr/epidimiologika-statistika-dedomena/ektheseis-covid-19>.

ment stated that it took economic activity into account in its decision making,[3] (ii) It is generally accepted that by looking into both the GDP (the widely used proxy for economic performance) and mortality, one may look into prosperity and social choice issues in a more comprehensive way (e.g., Sen, 1998; Peltzman, 2009; Balmford et al., 2020).

In Greece, the authorities had very little time to evaluate the various approaches adopted in China and other Asian countries that dealt, in January 2020, with what is now known as *the first wave* of the pandemic. The novel virus was first confirmed on European soil on January 24th 2020, based on an infection in France; three days later in Germany; and by the end of the month in Italy, Spain, the United Kingdom and Sweden. As the virus spread within countries and across Europe, it reached Greece on February 26, 2020, and, eventually, Albania and Cyprus, on March 8th 2020 (the last two countries to report at least one SARS-CoV-2 infection, among the countries considered in the article). Without effective vaccines at their disposal, but alarmed by the disproportionately high death toll that devasted neighboring Italy, the Greek authorities initially ordered local lockdowns and, soon after, a national lockdown that restricted all but essential movement and economic activity. The equally alarmed community swiftly obliged. Consequently, the number of confirmed SARS-CoV-2-related deaths was initially kept at a relatively low level (Schellekens and Sourrouille, 2020; Table 4.3.1).

4.3.2. The numbers

It turns out that in 2020^{Q1}, Greece's (i) quarterly GDP dropped to 98.6% of the respective 2019^{Q1} figure, and (ii) the total number of deaths rose to 100.3% of the respective 2019^{Q1} figure. By contrast, of the 31 European states considered: (a) Six states that were affected either earlier (Belgium, United Kingdom, Spain, Italy) or at the same time with Greece (Austria, Iceland), preformed worse in both measures (output decreased and casualties increased compared to 2019^{Q1}). (b) Six states that were affected either earlier (France, Germany) or at the same time with Greece (Portugal) or later (Albania, Slovenia, Slovakia) performed better in terms of human losses and worse in terms of GDP. (c) Three states that were affected either earlier (Sweden) or at the same time with Greece (the Netherlands) or later (Cyprus) performed better in terms of GDP and worse in terms of human losses. (d) 16 states that were affected either earlier (Finland) or at the same time with Greece (Switzerland, Luxemburg, Denmark, Norway, Poland, the three Baltic states, Czechia, Romania, Croatia) or later (Malta, Bulgaria, Serbia, Hungary) performed better in both measures. See Figure 4.3.1(1).

In 2020^{Q2}, as the nationwide restrictions remained in effect for the first month, and were eased afterwards, the quarterly GDP figure dropped to 84.4% of the respective 2019^{Q2} figure, and the total number of deaths fell to 96.4% of the respective 2019^{Q2} figure.[4] At the same time, of the 31 European states considered: (a) A cluster of five states (Italy, Spain, Portugal, France, the United Kingdom) performed worse in both measures. (b) Croatia performed better in terms of human losses and worse in terms of GDP. (c) 25 states performed better in terms of GDP and worse in terms of human losses. See Figure 4.3.1(2).

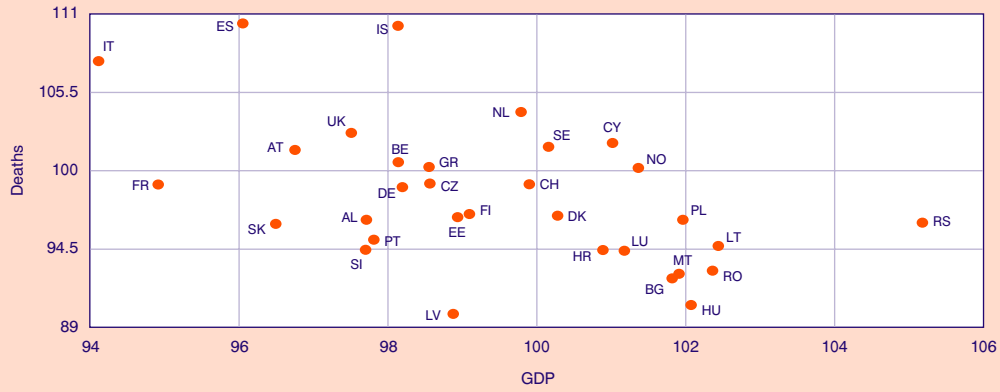
Early in 2020^{Q3} the authorities turned their attention to salvaging the high tourist season and restoring operations in other sectors of the economy. To that end, they completed the gradual re-opening of economic activity (close to full normalization, except for large public events). Unsurprisingly, given the situation in other parts of the world, the number of visitors was lower compared to 2019^{Q3}. However, to the extent (i) the restrictions were intended to slow the spread of the virus and mitigate the pandemic's effects on the healthcare systems (but not necessarily eliminate transmission of the virus), and (ii) the restrictions were eased and lifted in a manner that bred complacency in several segments of the population, the balancing act of opening up borders and activities in order to affect economic recovery etc., gave the virus a chance to continue to circulate. As a result, around mid-2020^{Q3} the numbers of SARS-CoV-2 infected and of hospitalized people, as well as SARS-CoV-2 confirmed deaths began to rise. On the whole, the quarterly GDP dropped to 90.6% of the respective 2019^{Q3} figure, and the total number of deaths rose to 104.8% of the respective 2019^{Q3} figure. At the same time, of the 31 European states considered: (a) Two states (Croatia, Malta) preformed worse in both measures. (b) A cluster of 16 central, northern and northeastern European

3. Indeed, it stated that by opening and closing economic activity where necessary, it aimed to both contain the economic downturn and manage the infection crisis. Moreover, in managing the situation it tried to avoid disrupting care for other diseases and potential causes of death.

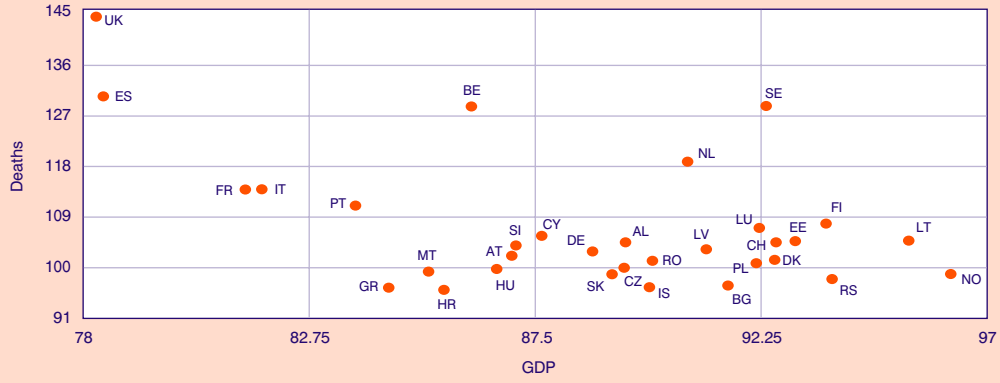
4. In all likelihood, the increased hand hygiene, the wearing of masks, along with school and business closures and the gathering-traveling or other restrictions imposed (e.g., ECDC, 2020), affected a reduction in deaths from other causes (e.g., from other respiratory diseases, from fewer road accidents during lockdowns, etc.).

FIGURES 4.3.1 (1-5)
The relative position of Greece and of other European states in terms of real GDP (2015 prices) and the total number of deaths during the pandemic, compared to the same quarter in 2019

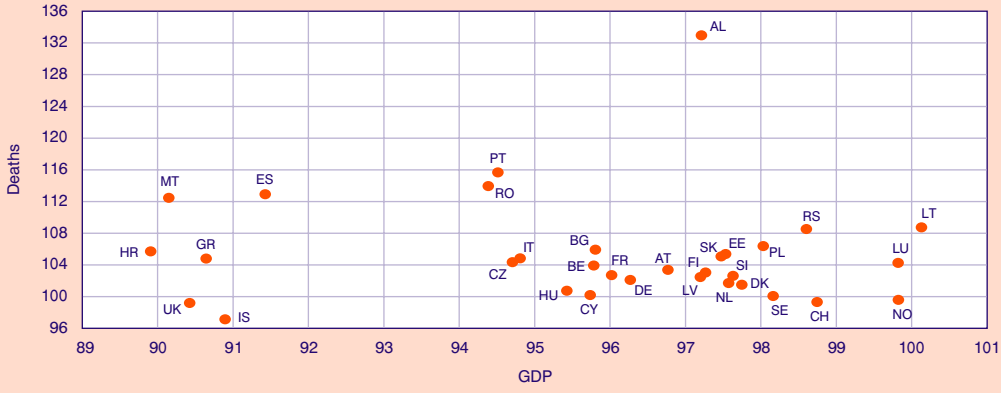
1. 2020^{Q1} compared to 2019^{Q1} (=100), 32 states



2. 2020^{Q2} compared to 2019^{Q2} (=100), 32 states

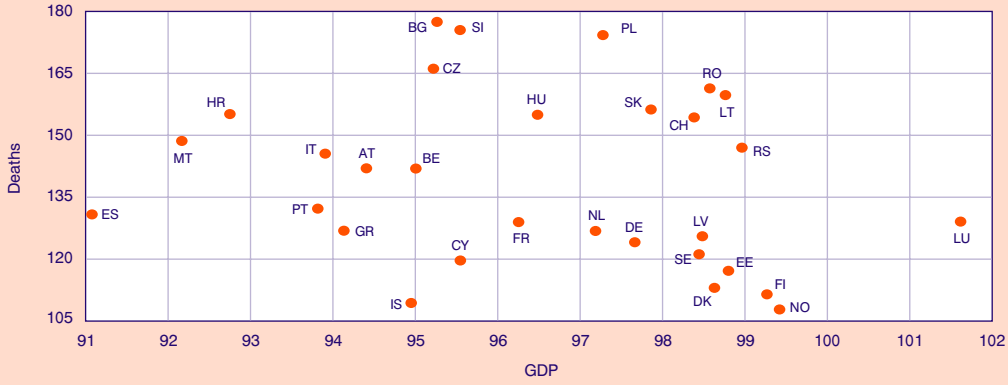


3. 2020^{Q3} compared to 2019^{Q3} (=100), 32 states

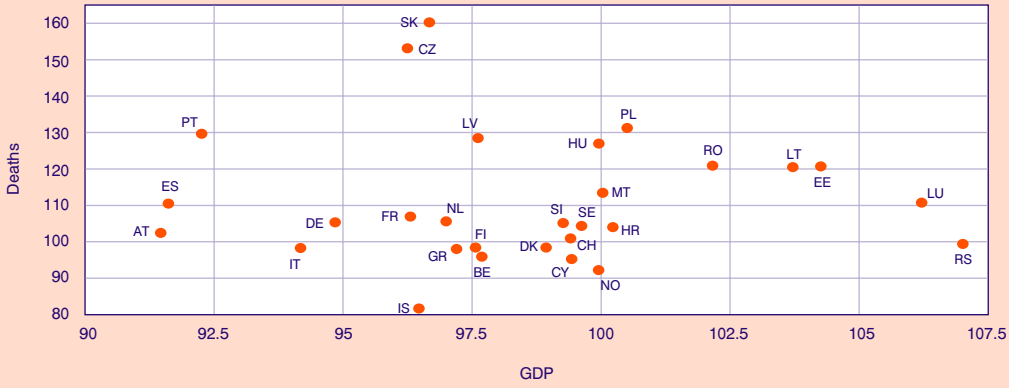


FIGURES 4.3.1 (1-5) (continued)

4. 2020^{Q4} compared to 2019^{Q4} (=100), 30 states



5. 2021^{Q1} compared to 2019^{Q1} (=100), 29 states



Source: Eurostat (the namq_10_GDP and demo_r_mwk_ts datasets updated, respectively, on June 6th and June 10th 2021). Own calculations.

Key for country codes: Albania (AL), Austria (AT), Belgium (BE), Bulgaria (BG), Croatia (HR), Cyprus (CY), Czechia (CZ), Denmark (DK), Estonia (EE), Finland (FI), France (FR), Germany (DE), Greece (GR), Hungary (HU), Iceland (IS), Italy (IT), Latvia (LV), Lithuania (LT), Luxembourg (LU), Malta (MT), Netherlands (NL), Norway (NO), Poland (PL), Portugal (PT), Romania (RO), Serbia (RS), Slovakia (SK), Slovenia (SI), Spain (ES), Sweden (SE), Switzerland (CH), United Kingdom of Great Britain & Northern Ireland (UK).

states (France, Belgium, the Netherlands, Luxemburg, Germany, Switzerland, Austria, Hungary, Slovenia, Czechia, Denmark, Sweden, Norway, Finland, Latvia, Iceland) and Cyprus performed better in both measures. (c) 11 southern and eastern European states (Portugal, Spain, Italy, Albania, Serbia, Bulgaria, Romania, Slovakia, Poland, Lithuania, Estonia) performed better in terms of GDP and worse in terms of human losses. (d) The United Kingdom performed better in terms of human losses and worse in terms of GDP. See Figure 4.3.1(3).

In 2020^{Q4}, as the numbers of confirmed infection cases and of related deaths continued to rise, Greece was pushed into the *second wave* of the pandemic. The government announced a new national lockdown in November that ran to the end of 2020^{Q4} and beyond. The GDP dropped to 94.1% of the respective 2019^{Q4} figure, and the total number of deaths rose to 117.9% of the respective 2019^{Q4} figure. Of the thirty European states considered and for which data are available:[5] (a) Five southern EU states (Portugal, Spain, Italy, Malta, Croatia) performed worse in both measures. (b) A

5. The data regarding Albania and the United Kingdom are not available.

cluster of nine central, northern and northeastern European states (the Netherlands, Germany, Denmark, Sweden, Norway, Finland, Estonia, Latvia, Iceland) and Cyprus performed better in both measures. (c) 14 contiguous states (Belgium, Luxemburg, France, Switzerland, Austria, Slovenia, Serbia, Bulgaria, Romania, Hungary, Slovakia, Czechia, Poland, Lithuania) performed better in terms of GDP and worse in terms of human losses. See Figure 4.3.1(4).

Early in 2021^{Q1}, the authorities commenced a mass vaccination campaign, and gradually lifted the lockdown restrictions. However, as the transmission of the virus had not been eliminated, and the virus continued to circulate, they had little choice but to re-introduce another lockdown in March in order to deal with the *third wave* of the pandemic. The lockdown ran to the end of the 2021^{Q1} and beyond. (The restrictions were gradually lifted in May and June 2021; the third wave ran into June 2021.) During 2021^{Q1} both the GDP and the total number of deaths fell to 97.2% and 97.3% of the respective 2019^{Q1} figures. Of the 29 European states considered and for which data are available.[6] (a) Nine contiguous states (Portugal, Spain, France, Italy, Austria, Slovakia, Czechia, Germany, the Netherlands) preformed worse in both measures. (b) Three states (Belgium, Norway, Cyprus) performed better in both measures. (c) 15 states (Denmark, Sweden, Finland, the three Baltic states, Poland, Hungary, Slovenia, Croatia, Serbia, Romania, Switzerland, Luxemburg, Malta) performed better in terms of GDP and worse in terms of human losses. (d) Iceland performed worse in terms of GDP and better in terms of human losses. See Figure 4.3.1(5).

4.3.3. Conclusions

As the SARS-CoV-2 pandemic spread across Europe in the course of seven weeks, it affected countries for unequal lengths of time —one for two months, another one for three weeks, Greece for about a month— in 2020^{Q1}. We keep this in mind when comparing the 2020^{Q1} output and mortality measures across countries.

In the four quarters that followed, Greece took both mild and more drastic steps to slow the spread of the virus and mitigate the pandemic's effects on the healthcare system. The restrictions disturbed economic and social life. As soon as the virus transmission went down, the restrictions were eased and lifted to allow for the economy and society to recover. Yet, easing and lifting the restrictions and giving the virus a chance to circulate widely again may have affected new transmission *waves*. Currently (summer of 2021), with the *third wave* having run its course, the authorities are once again turning their attention to salvaging the high tourist season and restoring operations across the economy.

In reviewing the numbers, we note the country's rankings in 2020^{Q2}: 2^{nd} best in the mortality measure and 22^{nd} in the output measure among the 26 EU member states. The performance suggests that the emphasis was placed squarely on the preservation of lives. The rankings of 2020^{Q3} (15^{th} place in the mortality measure and 24^{th} place in the output measure among the 26 EU member states) are in line with the attempt to contain the decline in output (the decline was not avoidable). As activities opened up, mortality worsened. The two rankings of 2020^{Q4} (9^{th} place in the mortality measure and 21^{st} place in the output measure among the 26 EU member states) and of 2021^{Q1} (3^{rd} place in terms of the mortality measure and 16^{th} place in the output measure among 25 EU member states) suggest that subsequently the country's performance in terms of both measures improved: improved time and time again. So, based on the findings, and considering that other EU member states probably had similar aspirations, it appears that Greece's approach was not only consistent, but also effective.

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Testing the (new) equity multiplier in the Greek banking system: 2002Q4–2019Q1

Konstantinos Loizos*
Yannis Panagopoulos**

Abstract

This article attempts to reveal the endogenous or the exogenous nature of the credit expansion of money, through the banking system, in the Greek economy. The way we tried to do this is through the assessment of the Basel III (2016) based equity multiplier model, which institutionally states that «banks' equity controls lending expansion» in the money-making process. The empirical results of Johansen (1988) and Lütkepohl and Reimers (1992) co-integration methodology, applied here, verified the existence of a reverse, both short-term and long-term, equity multiplier, from credit growth to banks' equity, in the Greek banking system, for the time period 2002Q4 – 2019Q1.

Keywords: *Equity multiplier, exogenous/endogenous money supply, co-integration.*

JEL classification*: E51, C23, C22.*

1. Introduction

One of the most interesting parts of international literature on credit and monetary policy is the control of the process of creating credit expansion and, consequently, the exogenous or endogenous nature of money in each banking system. It is also known that the exogenous nature of money is supported by representatives of Orthodox monetary schools of thought (e.g., Monetarists, New-Keynesian and "New Consensus"), while the endogenous nature of money is supported by representatives of Heterodox monetary schools of thought (e.g., the different versions of the Post-Keynesians[1]).

As Rochon (1999) states, the general philosophy for the representatives of all Orthodox monetary schools of thought is based on the view that changes in the elements of banks' financial liabilities trigger changes in its financial assets. However, in the case of Heterodox economists, this causal relationship between the banks' financial assets and liabilities is reversed: it is the banks' financial assets that cause the changes in the banks' financial liabilities.

Until a few years ago, the causal relationship between the banks' financial assets and financial liabilities was limited to the Classical/Heterodox debate whether "*bank reserves control deposits and deposits create loans*" (Lavoie, 1984), which then led to the discussion of the way the classic money multiplier operates (Panagopoulos and Spiliotis, 2008; Deleidi, 2020; etc.). The main objective of this article is to extend the discussion of the causal relationship between banks' financial assets and liabilities to the causal relationship between banks' equity and loans. In simple words, in this article, we try to reveal the nature of operation of the equity multiplier in the Greek banking system. This new credit multiplier is examined here for the time period 2002Q4–2019Q1 taking also into account the re-capitalizations of 2013–2015 in the Greek banking system.

The main conclusion drawn from our empirical analysis shows that there is a reverse short-term and long-

* Research Fellow, Centre of Planning and Economic Research (KEPE) and Visiting Lecturer at the University of Athens.
E-mail: kloizos@kepe.gr

** Senior Research Fellow, Centre of Planning and Economic Research (KEPE) and Visiting Lecturer at the Hellenic Open University.
E-mail: ypanag@kepe.gr

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

1. The "Structuralists" and the "Horizontalists" or "Accommodatalists" of the post-Keynesian schools of thought.

term relationship between equity and loans portfolios of the systemic banks that confirms the post-Keynesian/"Horizontalists" perception of the money creation process.

The article is structured as follows. In section 2, we discuss the theoretical explanation concerning the causal behavior of the equity multiplier, which also determines the exogenous or endogenous nature of the money generation process in the banking system. In section 3, we present the data, the econometric methodology and the empirical results. Finally, in section 4, we conclude.

2. The equity multiplier

The emergence of the importance of commercial banks' equity, as a key factor in banks' liabilities, has gradually resulted from several developments in credit and monetary issues. The abandonment of minimum reserve requirements of deposits by the central banks (Rochon and Rossi, 2010; Xiong and Wang, 2018, etc.), the lack of a convincing causal relationship between deposits and loans (Panagopoulos and Spiliotis, 2008), the increase in securitization of international loans (Lutskina and Strahan, 2009) and the globalization of the banking system (Goodhart et al., 2004; Puri et al., 2011, etc.), were the most important of them.

As has already been pointed out above, this has redefined the debate on how credit and money is created not only for the prevailing Orthodox monetary view, but also among Heterodox monetary economists. In particular, the importance of so-called "capital requirements or the capital adequacy ratio" for the credit expansion in the bank's balance sheet has been highlighted. This important relationship was first recognized by the Basel Committee in 1988 (Basel I) and, subsequently, was further improved and specialized by Basel II (2006) and Basel III (2016), aiming at financial stability in the conduct of monetary policy in every economy.

2.1. The Capital Adequacy Ratio (CAR)

The Basel III (2016) mandates follow the framework for the Orthodox monetary school about credit expansion and thus the creation of money supply process without considering the importance of credit demand. In other words, it could be said that, except for the institutionally 'outgoing' classical money multiplier, this school of thought –through the CAR– has now formulated a new credit multiplier, the so-called "equity multiplier". In addition, through detailed mandates, the Basel Committee has tried to clarify and control the different categories of bank loans, using different risk weights, in an attempt to stabilize the general CAR at least above a minimum «threshold» for all banks (Basel III [2016]).

This restrictive role of the CAR, in terms of credit creation and the money-making process, has nevertheless been theoretically and empirically challenged (Lavoie, 2003). In simple words, a possible "reversibility" of such a credit (and money) multiplier has already been empirically addressed and tested in various advanced economies (Karagiannis, et al, 2012; Panagopoulos and Spiliotis, 2017).

Thus, on the basis of the above theoretical analysis, we can summarize the three (3) main causal relationships that can be examined, in the empirical section of our article, in order to investigate the form of the operation of the equity multiplier in the Greek banking system. More specifically:

Hypothesis 1: Banks' equity forms the basis for the control and/or creation of the banks' loans (Equity $\Rightarrow$ Loans). If this is the causal relationship between the two variables, then this new multiplier is functional/active and consistent with the theoretical approach of the Orthodox school of thought and the Basel III.

Hypothesis 2: Banks' loan portfolios trigger the creation of equity (Loans $\Rightarrow$ Equity). If this is the causal relationship of the two variables, then the new multiplier is functional, but in the reverse way. The theoretical interpretation of such a relationship is that the new multiplier follows the "Horizontalists" view of the Heterodox monetary school.

Hypothesis 3: Banks' equity is in a feedback relation with their loan portfolio (Equity $\Rightarrow$ Loans). If this is the causal relationship between the two variables, this signals that the amount of banks' equity restricts the expansion of loans and, at the same time, loans, through their repayment process, "feed" the size of the banks' equity. The theoretical interpretation of this relationship is that the new multiplier follows the "Structuralists" view of the Heterodox monetary school.

Theoretically, we could also add a fourth case, which would take the following form:

Hypothesis 4: Banks' equity is not related to their loan portfolios (Equity $\neq$ Loans). If this is the (non) causal relationship of the two variables, this indicates that the new multiplier is not functional/active in the banking system of the country examined.

In the following section we will empirically examine the capital multiplier, in the Greek banking system, from the period of accession to the euro (2002) until the first quarter of 2019.

3. Data, econometric methodology and empirical results

We make use of quarterly data for the Greek banking system (2002Q4–2019Q1) which has been obtained from the Bank of Greece and the Thompson Reuters Eikon data base. Specifically, we employ data for total credit, which corresponds to gross loans in thousand euros, as these are provided by the Bank of Greece (BoG), which we have transformed into natural logarithms. In addition, we have collected data on Capital Adequacy Ratios (CAR) (defined as total equity over total assets) for the National Bank of Greece, Alpha Bank, Eurobank, Piraeus Bank and Attica Bank, derived from the data base of Thompson Reuters Eikon. On the basis of this data, we have constructed a Capital Adequacy Ratio (CAR), for the Greek banking system, as the weighted average of individual bank's ratios. Each bank participates in this average with a weight equal to the ratio of its assets over the sum of the assets of all five banks.[2]

Figure 1 depicts the natural logarithm of gross loans and indicates the existence of a turning point in their evolution after a long period of a continuous rising trend. Specifically, from mid-2010 onwards, during the manifestation of the fiscal and debt crisis in Greece, loans follow a downward trend despite a short-lived rebound in the first quarter of 2013.

In addition, CAR, as depicted in Figure 2, decreases substantially during the interval 2011Q3–2012Q4, a period which is marked by a steep decline in banks' equity which, in some cases, turns negative. Furthermore, CAR fluctuates also during the interval 2014–2015 and up to 2016Q1. These two "anomalies" relate both to the effect of public debt restructuring on banks' balance sheets through the Private Sector Involvement (PSI), and the three (3) recapitalizations of Greek banks that followed: those of May-June 2013, April-May 2014 and December 2015 (Kolliopoulos, 2020; Panagopoulos and Peletidis, 2015; Bank of Greece, 2012).[3]

According to the relevant unit root tests, we conclude that the natural logarithm of loans (Loans) and the Capital Adequacy Ratio (CAR) are both I(1)[4].

FIGURE 1
The natural logarithm of gross loans: 2002Q4–2019Q1

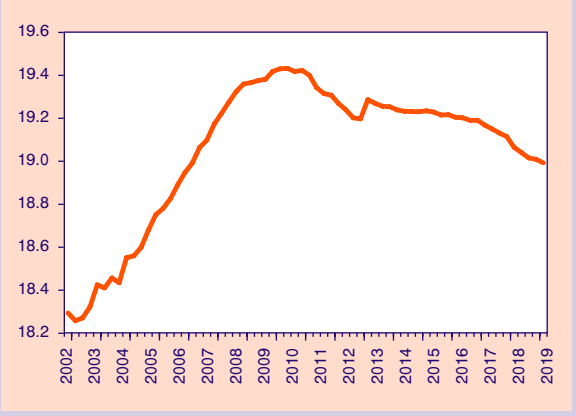
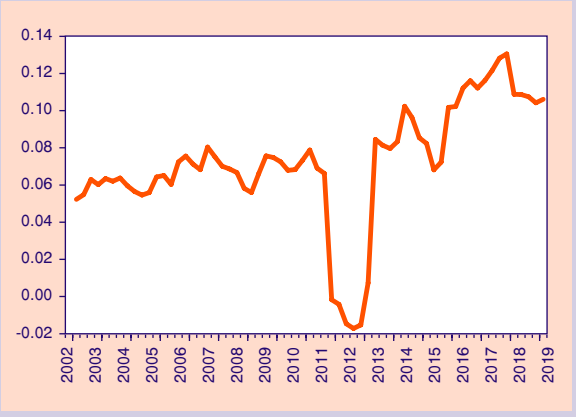


FIGURE 2
Capital Adequacy Ratio (CAR) (as a percentage, % of Assets), 2002Q4– 2019Q1



In order to find out which of the assumptions (1 to 4) concerning the new credit multiplier (equity), referred to in the previous section, is valid in the Greek case –during the two first decades of the 21st century, when the country joined the Eurozone– we make use of a Vector Autoregressive (VAR) bivariate causality technique introduced by Lütkepohl and Reimers (1992).

2. Following Honda (2002) and Roulet (2018), we employ the variable of the Capital Adequacy Ratio (CAR) as a proxy for the role of equity capital in the causal relationships under examination.

3. For a detailed presentation of the recapitalization process concerning the four (4) Greek systemic banks, the National Bank of Greece, Alpha Bank, Eurobank and Piraeus Bank, see Panagopoulos and Peletidis (2015).

4. We employed the following tests: Augmented Dickey Fuller (ADF), Phillips-Perron (PP) and Kwiatkowski-Phillips-Schmidt-Shin (KPSS). The ADF and PP tests indicate that the above time series are non-stationary I(1) whilst the KPSS test concludes that they are stationary I(0). However, after inspecting the relevant graphs of autocorrelation, the existence of a unit root is confirmed for both variables. Our unit root tests results are available on demand to the interested reader.

The same technique has been employed by Panagopoulos (2010) for the Greek banking system during the period 1995Q1–2006Q1.

In Tables 1 and 2, we present the results of the Johansen co-integration test according to the above methodology. Specifically, we run tests both on the whole sample and on the same sample with the introduction of two dummy variables (dummy2013Q2 and dummy2016Q1) in order to take into account the period of banks' recapitalizations, the importance of which is stressed by Kolliopoulos (2020) and by Panagopoulos and Peletidis (2015), as explained above.[5]

Inspecting the results of the Johansen test for long-run causality between CAR and Loans presented in Tables 1 and 2, we conclude that such a relationship only exists when the effect of banks' recapitalizations is accounted for by the two (2) dummies for the quarters 2013Q2 and 2016Q1. Consequently, we reach a different result than that of Panagopoulos (2010) who, when examining the period 1995Q1–2006Q1,

TABLE 1 Johansen test results between Capital Adequacy Ratio and Loans, 2003Q3–2019Q1

Johansen cointegration test	Critical values	λ Max-eigenvalue	λ Trace	Π(r) value	Number of Lags	Long-run relationship
CAR vs. Loans	MacKinnon-Haug-Michelis (1999)	15.01 [15.89] (0.07)	19.18 [20.26] (0.07)	0	1	Loans ≠ CAR

Notes: The choice of lags was based on the Likelihood Ratio (LR) test, Akaike Information Criterion (AIC), Final Prediction Error (FPE), Schwarz Information Criterion (SC) and Hannan and Quin Criterion (HQ). However, when there is disagreement among these tests, we followed Burke and Hunter (2005), and we chose the number of lags indicated by the Schwarz Information Criterion (SC). Critical values at the 5% level of significance are inside brackets and p-values are inside parentheses. According to the Pantula principle (See Harris (1995: 97)), we chose a model with an intercept but no trend in the cointegrating equation and no intercept or trend in VAR.

TABLE 2 Johansen test results between Capital Adequacy Ratio and Loans, 2003Q3–2019Q1*

Johansen cointegration test	Critical values[6]	λ Max-eigenvalue	λ Trace	Π(r) value	Number of Lags	Long-run relationship
CAR vs. Loans	MacKinnon-Haug-Michelis (1999)	24.28 [19.39] (0.01)	34.02 [25.87] (0.004)	reduced rank r = 1	1	There exists a relationship between Loans and CAR
	Giles and Godwin (2012)	-	34.02 [22.34]			

Notes: Remarks in Table 1 concerning the choice for the number of lags still hold. For m variables and v_j sample breakpoints the Giles and Godwin (2012) critical values correspond to $m - r = 1$, $v_1 = 0.65$, $v_2 = 0.80$ and a linear trend. According to the Pantula principle, we chose a model with an intercept in the cointegrating equation and VAR, a linear trend in the cointegrating equation and no trend in VAR.

* Including two dummies in quarters 2013Q2 and 2016Q1.

5. For a similar econometric approach to the same issue, see also Economou, et. al. (2016) and Panagopoulos and Peletidis (2016).

6. Since in the case that exogenous variables are introduced, MacKinnon, Haug and Michelis (1999) critical values do not hold, we also report the Giles and Godwin (2012) critical values for the trace test.

TABLE 3 Wald test results for Granger short-run causality between the Capital Adequacy Ratio and Loans*

Null Hypothesis	χ^2 value
Δ(Loans) does not cause Δ(CAR)	12.96 (0.00)
Δ(CAR) does not cause Δ(Loans)	0.30 (0.58)

Note: p-values inside parentheses. We ran the test estimating a VECM with one (1) lag.

* Results obtained from an estimated VECM, 2003Q3–2019Q1, with dummy variables for the quarters 2013Q2 and 2016Q1 respectively.

TABLE 4 VECM test for long-run causality

Dependent vs. independent variable	ECT_{t-1}, coefficient (a_i)	Long-run causality
Δ(Loans) vs. Δ(CAR)	-0.007 (-3.357)	Loans ⇒ CAR
Δ(CAR) vs. Δ(Loans)	0.003 (3.376)	

Note: Values of the *t* statistic inside parentheses. We ran the test estimating a VECM with one (1) lag.

attributed the lack of a long-run relationship to the immaturity of the Greek banking system and the existence of "redundant" equity that rendered the equity multiplier as non-operational. However, our estimation period includes time intervals characterized by significant pressure on banks' equity capital, which turn negative during 2011Q4–2012Q4. Because of this event, the banking sector entered a period of successive recapitalizations in the years 2013, 2014 and 2015. Therefore, it seems that CAR plays a more significant role in the period under examination, which calls for further research concerning the effect for the Greek banking system of the (new) credit multiplier in the context of Basel II (as of 2006) and Basel III (as of 2010).

In this sense, and following Panagopoulos and Spiliotis (2006), in Tables 3 and 4 we present the Wald test results, both for short-term and long-term Granger causality, after estimating a Vector Error Correction Model (VECM) of the following form[7]:

$$\Delta L_t = c_1 + \gamma_{11}\Delta L_{t-1} + \gamma_{12}\Delta(CAR)_{t-1} + \lambda_{11}D_1 + \lambda_{12}D_2 + \\ + a_1\, ECT_{t-1} + u_{1t}$$

$$\Delta(CAR)_t = c_1 + \gamma_{21}\Delta L_{t-1} + \gamma_{22}\Delta(CAR)_{t-1} + \lambda_{21}D_1 + \lambda_{22}D_2 + \\ + a_2\, ECT_{t-1} + u_{2t}$$

Where L_t is the natural logarithm of gross loans, CAR_t is the Capital Adequacy Ratio, D_1 & D_2 the two (2) dummy variables to capture the effect of banks' recapitalizations (2013Q2 and 2016Q1 respectively) and ECT_{t-1} the Error Correction Term.

The existence of a short-run unidirectional causal relationship from Loans to CAR is implied by Table 3. The same relationship for the long run is derived from Table 4 since, despite the fact that both coefficients of the ECT_{t-1} term are statistically significant, only the coefficient a_1 has the correct (negative) sign. Hence, the above analysis confirmed Hypothesis 2 of Section 2.1 above, and therefore, the theoretical position of the Heterodox school of "Horizontalists", namely that "Loans cause the corresponding levels of CAR and not the other way round".

4. Conclusions

The main goal of this article was to test for and clarify the endogenous or exogenous nature of credit money in the Greek economy during the whole period of Eurozone membership. This task was carried out through a test of the Basel III (2016) equity multiplier that theoretically designates the way by which "banks' equity controls their credit expansion".

The empirical results of the Johansen methodology and the bivariate causality technique by Lütkepohl and Reimers (1992) indicated the existence of a reverse causal relationship, from Loans to Equity, which indicates the endogenous nature of money in the Greek banking system. These results are in contrast to both the Orthodox monetary theory, which is followed by Basel III, and the empirical results by Panagopoulos (2010), where there was no evidence to justify a direct relationship between banks' equity and loans. In the new extended estimation period and despite prolonged recession in the Greek economy, after 2009, with its negative

7. In conformity with Panagopoulos and Spiliotis (2006), we stress that the VECM causality methodology employed here should be treated as a testing procedure rather than as a comprehensive model.

effects on credit expansion, the (new) equity multiplier seems to be both operative and endogenous. In fact, this result can be justified *because of* depressed credit expansion during the last few years in Greece due to this recession which seem to exaggerate the negative effects on banks' equity capital.

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Developments in the labor markets and sectors of the business economy during 2008-2017 in Greece

Pródromos Prodromídis*

Abstract

The article looks into the structure and performance of twelve sectors of Greece's business economy, and into the developments in their respective labor markets, during the country's long economic downturn. Using Eurostat's structural business statistics, it finds that: (a) Between 2008 and 2017, the sectors moved at different paces and/or in different ways. For instance, the trade sector shrunk in terms of jobs and companies, the water supply sector shrunk in terms of staff. The accommodation-food service sector came to employ (absorb) more people in 2017 compared to the 2008, but, on average, profits decreased. In the electricity sector, profits increased. In the mining-quarrying sector, labor productivity increased, and in the information-communication sector, it decreased. (b) The developments regarding the number of businesses and employees in two sectors (trade and manufacturing) are similar to the corresponding developments in other EU member states. (c) Whenever the number of businesses and the average size of businesses in a sector fell, the respective labor market was (or had been) dominated by a leftward demand shift or a binding reduction of a wage ceiling, and, consequently, by a reduction in employment.

Keywords: *Debt crisis & recession, labor supply & demand, Number & size of businesses, Labor productivity & profitability, Greek & European businesses.*

JEL classification*: J20, L60, L70, L80, L90, M20.*

1. Introduction

The international financial crisis of 2007-08 sparked in Greece a government debt crisis. The crisis was dealt with via three successive bailouts, and measures that led to a long recession both in terms of output and of employment. The recession brought about uncertainty and fluidity in many aspects of social, economic, political and cultural life, which, in turn, probably culminated with the imposition of capital controls in 2015. The bailout agreements were completed in 2018. However, the recovery was interrupted in 2020-21 by the outbreak of the SARS-CoV-2 pandemic. See Figure 1. The expectation is that things will return to normal, and a new economic policy will be employed.

Before moving forward, in the pages that follow, we briefly look back and discuss what happened during 2008-17 in the labor markets and to key features of the *business economy.* The features that we consider most crucial touch on market structure and competition, and on businesses performance. They are four: the number of businesses, the average size of businesses (in terms of people employed), the average labor productivity of businesses (in terms of gross value added per person employed), and the average profitability of businesses (proxied by the share of the gross operating surplus in turnover; OECD, 2010).

As more data regarding the recession period are now available by Eurostat, we turn to the twelve *business economy* sectors that Eurostat keeps track of. These are: (a) mining-quarrying, (b) manufacturing, (c) electricity-gas-steam-air conditioning supply, (d) water supply-sewerage-waste management-remediation activities, (e) construction, (f) trade (wholesale and retail) plus the repair of motor vehicles-motorcycles, (g) transportation-storage, (h) accommodation-food service activities, (i) Information-communication, (j) real estate activities, (k) professional-scientific-technical activities, (l) administrative-support service activities.**[1] However, the data regarding construction are available only from

* Senior Research Fellow, Centre of Planning and Economic Research (KEPE). E-mail: pjprodr@kepe.gr

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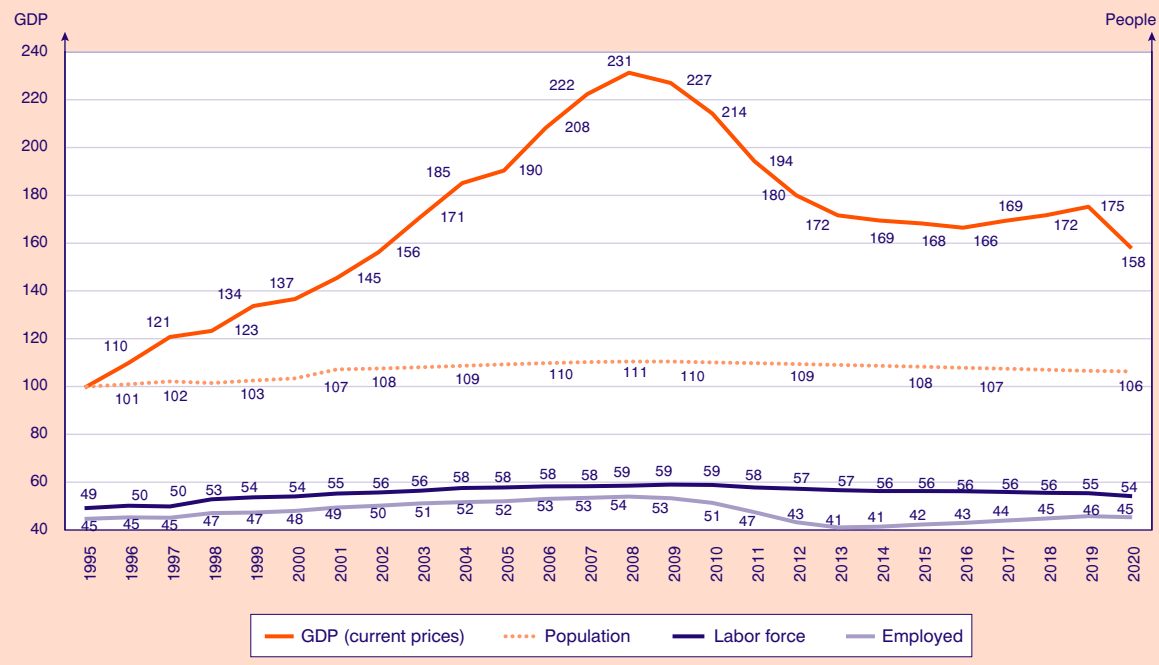
– Opinions or value judgments expressed in this article are the author's own and do not necessarily reflect those of the Centre of Planning and Economic Research.

** Certain footnotes are cross-referenced several times. Please keep in mind that the original footnote may be found on a previous page.

1. The agriculture-forestry-fishing and financial sectors are treated separately, while the personal services sector and sectors that by and large consist of non-market services (e.g., public administration, education, health) are not included in the particular dataset.

FIGURE 1
The evolution of output, of the population aged 15 years or older, and of the employed and unemployed people of the same age in Greece, 1995-2020 (1995=100)



Sources: Hellenic Statistical Authority (GDP statistics), Eurostat (other statistics); own calculations.

Note: Both the GDP (measured on the vertical axis on the left) and the other variables (measured on the vertical axis on the right) are in index form. The population includes the labor force and the people who do not participate in the labor market. The workforce consists of the employed and the unemployed people.

2011 on, a break in the series occurs in 2014,[2] and the data regarding 2014-17 are temporary (i.e., not yet finalized). Construction aside, the eleven other sectors appear to employ 52.9-63.6% of all employees, and to contribute about 60.7-65.2% of Greece's gross value added or 54.2-57.7% of the country's gross domestic product (GDP).

In view of the above, the purpose of the article is two-fold: (i) To identify similarities and differences in the way the labor markets and businesses in the said sectors adjusted or reacted. (ii) To ascertain how key labor market and key business features may be linked, at least under the special conditions of the recession and the policy mix followed. Some of these issues have been studied by Karamessini (2012), Agiomirgianakis et al. (2013), Moutos (2015), Voulgaris et al. (2015), Papastathopoulos et al. (2019), Papathanasiou et al. (2020), and others; while a number of relations among the labor supply, the labor demand, market structure, business size, and sectoral performance have been studied by a rather small number of analysts, such as Prskawetz et al. (2008) and Dustmann and Glitz (2015).

The article is organized as follows: Section 2 describes the developments in the labor market of the *business economy,* as well as the developments in the number, the average size, and the performance of businesses in terms of labor productivity and profitability in the *business economy* collectively (i.e., the eleven sectors for which data exist for the whole period). Section 3 describes the developments in each of the twelve sectoral labor markets. Section 4 describes the developments in the average size and number of businesses in each of the twelve sectors. Section 5 describes the developments in average labor productivity and the profitability of businesses in each of the twelve sec-

2. Breaks in statistical time series occur when there is a change in the standards for defining and observing a variable over time. Ideally, the use of a new method involves the recalculation by the data producer of past values with the new method. This, however, did not happen here.

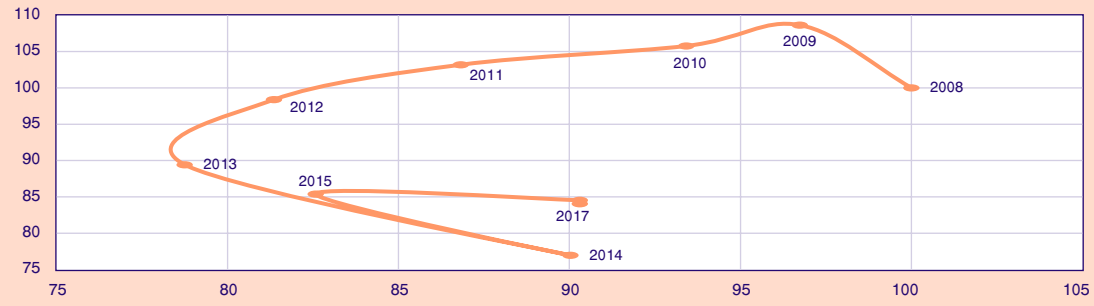
tors. Section 6 looks into sectoral similarities in other European Union (EU) member states; and Section 7 provides the conclusions.

2. Developments in the eleven sectors collectively

If the employment and wage statistics in the eleven sectors correctly capture what happened (Figure 2), then the simultaneous: (a) Fall in the number of employees and rise in the average wage observed in 2008-09 suggests the dominance of a leftward labor supply shift, possibly due to reduced participation in the labor market or due to rightward labor demand shifts in other sectors or due to other developments. (b) Fall in both the number of employees and the average wage observed in 2009-13 suggests the dominance of a leftward labor demand shift, possibly due to reduced demand for goods and services, and/or a binding reduction of a wage ceiling. Indeed, at the same time, economic activity, as proxied by the GDP, fell by 24%, and pay cuts were applied in state-controlled enterprises in transportation, electricity etc. (c) Rise in the number of employees and fall in the average wage observed in 2013-14 suggests the dominance of a rightward labor supply shift. On the other hand, the development may be attributed to the aforesaid break in the time series.[2] (d) Fall in the number of employees and rise in the average wage observed in 2014-15 suggests the dominance of a new leftward labor supply shift. (e) Rise in the number of employees and fall in the average wage observed in 2015-17 suggests the dominance of a rightward labor supply shift.

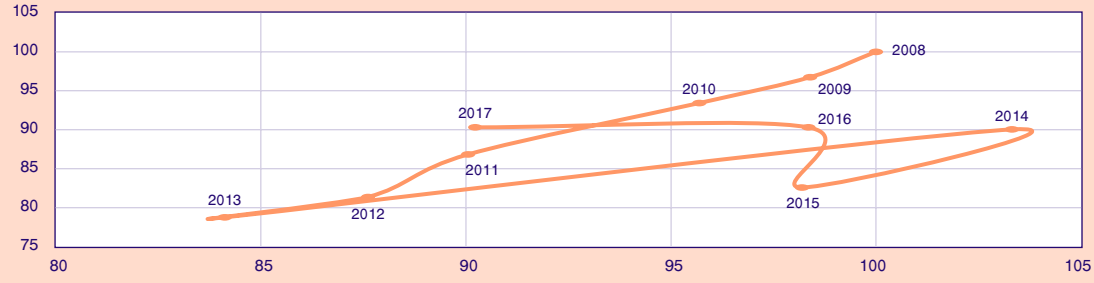
The evolution of the overall number of businesses and of the overall number of people employed in the eleven sectors (provided in Figure 3) shows that: (a) In 2008-13 both fell, the former by 16% and the latter by 21% (compared to the beginning of the period). This sug-

FIGURE 2
The evolution of the total number of employed people and of average wages (on the horizontal and on the vertical axis, respectively) in the eleven sectors of activity in Greece, 2008-17 (2008 = 100)



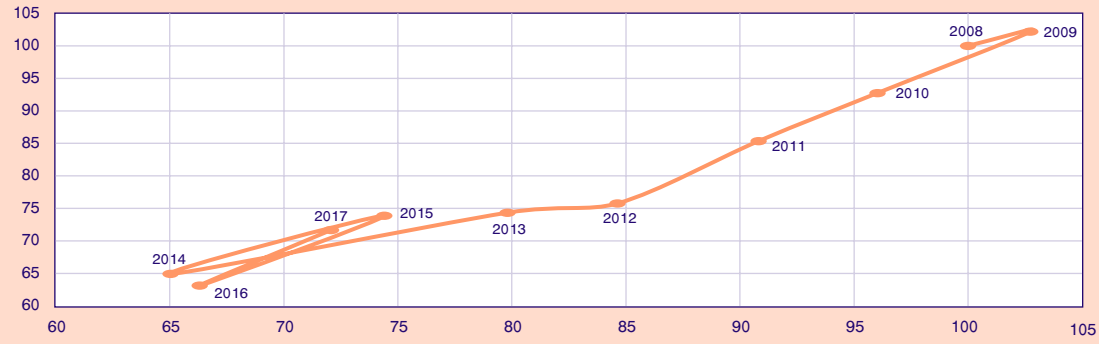
Source: Eurostat; own calculations.

FIGURE 3
The evolution of the number of businesses and of the number of employed people (on the horizontal and on the vertical axis, respectively) in the eleven sectors of activity in Greece, 2008-17 (2008 = 100)



Source: See Figure 2.

FIGURE 4
The evolution of profitability and of labor productivity (on the horizontal and on the vertical axis, respectively) in the eleven sectors of activity in Greece, 2008-17 (2008 = 100)



Source: See Figure 2.

gests a reduction in market competition and employment. At the same time, it appears that, on average, the size of businesses in terms of staff fell from 3.4 to 3.2 people.[3] (b) In 2013-14 both rose. This may suggest increased market competition and employment, but may also be attributed to the aforesaid break in the time series.[2] (c) In 2014-15 both fell. This suggests a new reduction in market competition and employment. It also appears that, on average, the size of businesses in terms of staff fell to 2.8 people. (d) In 2015-16 both rose (the number of businesses rose marginally). This suggests increased market competition and employment. It also appears that, on average, the size of businesses in terms of staff rose to 3.1 people. (e) In 2016-17 both rose further, which suggests increased market competition and employment. It also appears that, on average, the size of businesses in terms of staff rose to 3.4 people, as at the beginning of the period.

In addition, the labor productivity and profitability data (Figure 4) suggest that both increased in 2008-09, 2014-15 and 2016-17, and both fell in 2009-13, 2015-16 and, possibly, in 2013-14.[4]

3. Developments in the twelve labor markets

According to the labor market data for each of the twelve sectors (Figures 5: 1-12): (a) In mining etc., a rightward labor supply shift in 2008-9 was followed by a leftward labor supply shift in 2009-11, a leftward labor demand shift in 2011-12, a new rightward labor supply shift in 2012-13, possibly a rightward labor demand shift in 2013-14,[4] a leftward labor supply shift in 2014-15, a leftward labor demand shift in 2015-16, and a rightward labor demand shift in 2016-17.[5] (b) In manufacturing, a leftward labor supply shift in 2008-10 was followed by a leftward labor demand shift in 2010-13, possibly a rightward labor supply shift in 2013-14,[4] a new leftward labor supply shift in 2014-15, a rightward labor supply shift in 2015-16, and a rightward labor demand shift in 2016-17.[6] (c) In electricity etc., a leftward labor supply shift in 2008-09 was followed by a leftward labor demand shift and/or a binding reduction of a wage ceiling in 2009-11, a new leftward labor supply shift in 2011-13, possibly a rightward labor supply shift in 2013-14,[4] a leftward labor supply shift in 2014-15, a rightward labor supply shift in 2015-16,

3. Both numbers indicate that businesses were quite small by European Commission (2020) standards.

4. It may also be attributed to the break in the time series.

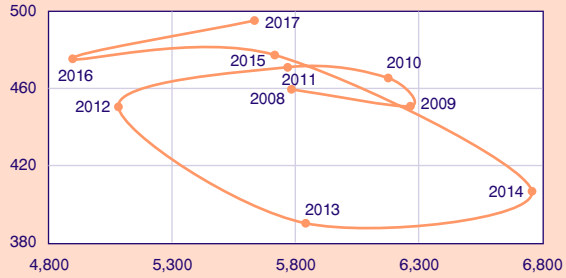
5. If the new method of calculating the data after the break is consistent with the initial method (i.e., if the result does not differ much from the result of the initial method), then the market probably ended up at a lower level of employment and a higher average wage compared to the beginning of the period.

6. If the new method of calculating the data after the break is consistent with the initial method (i.e., if the result does not differ much from the result of the initial method), then the market probably ended up at a lower level of employment and a lower average wage compared to the beginning of the period.

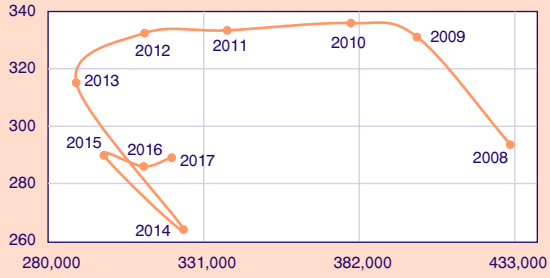
FIGURES 5

The evolution of the number of employed people and of the average weekly wages in euro (on the horizontal and the vertical axis, respectively): Greece, 2008-17

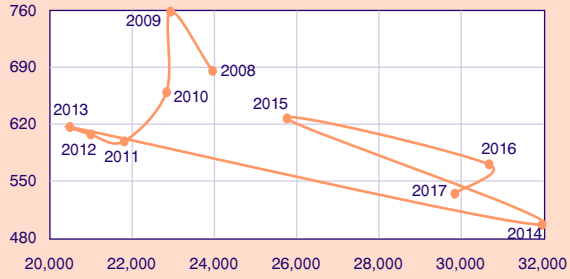
1. Mining-quarrying



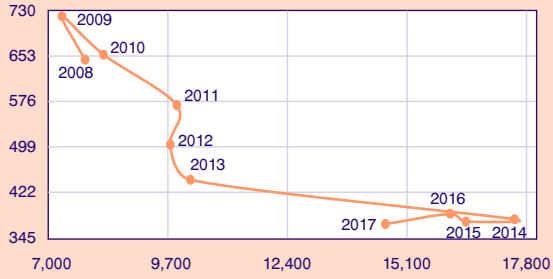
2. Manufacturing



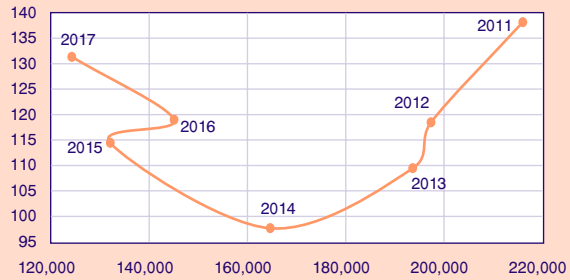
3. Electricity etc.



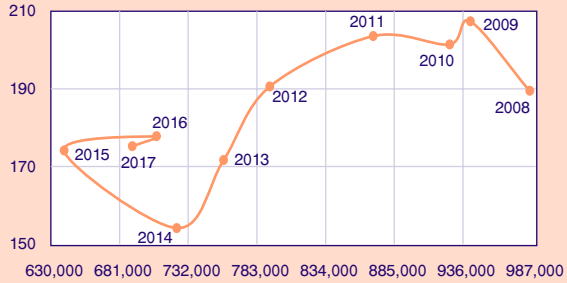
4. Water supply etc.



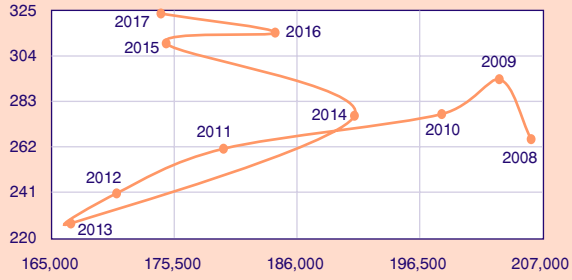
5. Construction



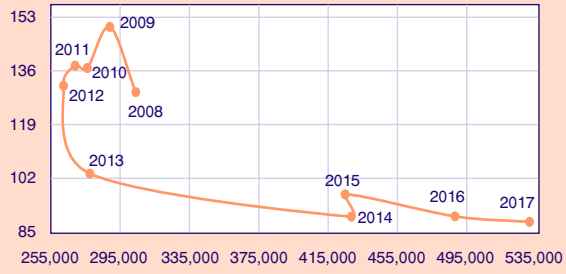
6. Trade-repair of motor vehicles



7. Transportation-storage

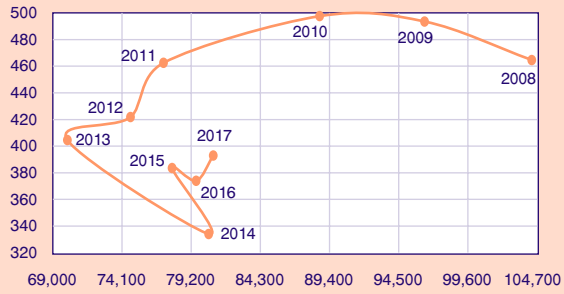


8. Accommodation-food service

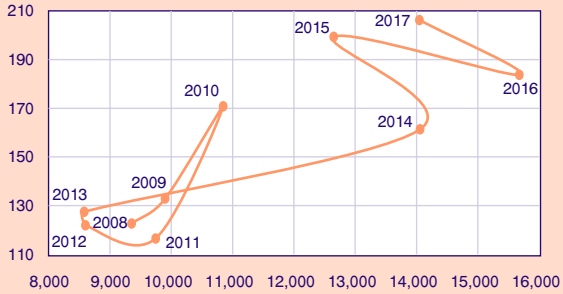


FIGURES 5 (continued)

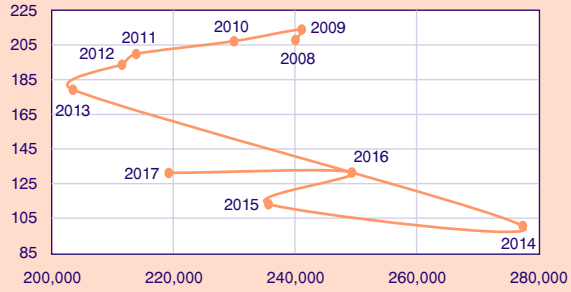
9. Information-communication



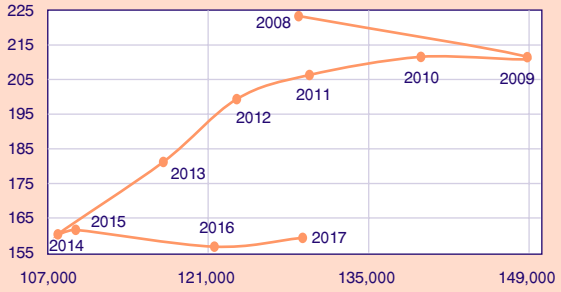
10. Real estate



11. Professional activities etc.



12. Administrative activities etc.



Source: See Figure 2.

and another leftward labor demand shift in 2016-17.[7] (d) In water supply etc., a leftward labor supply shift in 2008-09 was followed by a rightward labor supply shift in 2009-11, a leftward labor demand shift in 2011-12, a rightward labor supply shift in 2012-13 and, possibly, in 2013-14,[4] a new leftward labor demand shift in 2014-15, a leftward labor supply shift in 2015-16, and another leftward labor demand shift in 2016-17.[7] (e) In construction (the data are available from 2011 on), a leftward labor demand shift in 2011-13 and, possibly, in 2013-14,[4] was followed by a leftward labor supply shift in 2014-15, a rightward labor demand shift in 2015-16, and a new leftward labor supply shift in 2016-17.[6] (f) In trade etc., a leftward labor supply shift in 2008-09 was followed by a leftward labor demand shift in 2009-10, a new leftward labor supply shift in 2010-11, a leftward labor demand shift in 2011-13 and, possibly, in 2013-14,[4] a leftward labor supply shift in 2014-15, a rightward labor demand shift in 2015-16, and another leftward labor demand shift in 2016-17.[6] (g) In transportation etc., a leftward labor supply shift in 2008-09 was followed by a leftward labor demand shift and/or a binding reduction of a wage ceiling in 2009-13, possibly a rightward labor demand shift in 2013-14,[4] a new leftward labor supply shift in 2014-15, a rightward labor demand shift in 2015-16, and another leftward labor supply shift in 2016-17.[5] (h) In accommodation etc., a leftward labor supply shift in 2008-09 was followed by a leftward labor demand shift in 2009-10, a new leftward labor supply shift in 2010-11, a leftward labor demand shift in 2011-12, a rightward labor supply shift in 2012-13 and, possibly, in 2013-14,[4] another leftward labor supply shift in 2014-15, and a rightward labor supply shift in 2015-17.[7] (i) In information etc., a leftward labor supply shift in 2008-10 was followed by a leftward labor demand shift in 2010-13, possibly a rightward labor supply shift in 2013-14,[4] a new leftward labor supply shift in 2014-15, a rightward labor

7. If the new method of calculating the data after the break is consistent with the initial method (i.e., if the result does not differ much from the result of the initial method), then the market probably ended up at a higher level of employment and a lower average wage compared to the beginning of the period.

supply shift in 2015-16, and a rightward labor demand shift in 2016-17.[6] (j) In real estate, a rightward labor demand shift in 2008-10 was followed by a leftward labor demand shift in 2010-11, a leftward labor supply shift in 2011-13, possibly a rightward labor demand shift in 2013-14,[4] a new leftward labor supply shift in 2014-15, a rightward labor supply shift in 2015-16, and a leftward labor supply shift in 2016-17.[8] (k) In professional activities etc., a rightward labor demand shift in 2008-09 was followed by a leftward labor demand shift in 2009-13, possibly a rightward labor supply shift in 2013-14,[4] a leftward labor supply shift in 2014-15, a new rightward labor demand shift in 2015-16, and a leftward labor demand shift in 2016-17.[6] (l) In administrative activities etc., a rightward labor supply shift in 2008-09 was followed by a leftward labor supply shift in 2009-10, a leftward labor demand shift in 2010-13 and, possibly, in 2013-14,[4] a rightward labor demand shift in 2014-15, a new rightward labor supply shift in 2015-16, and a rightward labor demand shift in 2016-17.[7]

Overall: (a) 2008-09 saw rightward labor demand shifts in real estate and professional activities etc., rightward labor supply shifts in mining etc. and administrative activities etc., and leftward labor supply shifts in the other sectors, resulting in an overall fall in employment (see Figure 2). (b) 2009-10 saw the continuation of a rightward labor demand shift in real estate and of leftward labor supply shifts in manufacturing and information etc., as well as a rightward labor supply shift in water supply etc., leftward labor supply shifts in mining etc. and administrative activities etc., and leftward labor demand shifts or binding reductions of wage ceilings in the other sectors, all resulting in an overall fall in employment. (c) 2010-11 saw the continuation of a rightward labor supply shift in water supply etc. and of a leftward labor supply shift in mining etc., as well as leftward labor supply shifts in trade etc. and accommodation, etc., and leftward labor demand shifts in the other sectors, all resulting in an overall fall in employment. (d) 2011-12 saw leftward labor supply shifts in electricity etc. and real estate, and leftward labor demand shifts in the other sectors. It was the only year in which employment fell in all twelve sectors. (e) 2012-13 saw the continuation of leftward labor supply shifts in electricity etc. and real estate, as well as rightward labor supply shifts in mining etc., water supply etc., accommodation etc., and leftward labor demand shifts in the other sectors, all resulting in an overall fall in employment. (f) 2013-14 may have seen rightward labor demand shifts in mining etc., transportation etc., and real estate, leftward labor demand shifts in construction, trade etc., administrative activities etc., and rightward labor supply shifts in the other sectors, all resulting in an overall rise in employment.[4] (g) 2014-15 saw a rightward labor demand shift in administrative activities etc., a leftward labor demand in water supply etc., and leftward labor supply shifts in the other sectors, all resulting in an overall fall in employment. (h) 2015-16 saw rightward labor demand shifts in construction, transportation etc., trade etc. professional activities etc., a leftward labor demand shift in mining etc., a leftward labor supply shift in water supply etc., and rightward labor supply shifts in the other sectors, all resulting in an overall rise in employment. (i) 2016-17 saw the continuation of a rightward labor supply shift in accommodation etc., as well as leftward labor supply shifts in construction, transportation etc., and real estate activities, rightward labor demand shifts in mining etc., manufacturing, information etc., and administrative activities etc., and leftward labor demand shifts in the other sectors, all resulting in an overall fall in employment.

In addition, the 2008-13 and 2014-17 statistics show that: (i) The largest rises in employment occurred in sectors with both high and medium-to-low employment at the beginning of the period under consideration: primarily in accommodation etc., secondarily in administrative activities etc. (ii) The largest falls in employment occurred in the sectors with the highest employment at the beginning of the period under consideration: primarily in trade etc., secondarily in manufacturing.

4. Developments in business numbers and size in the twelve sectors

According to the sectoral business figures (Figures 6: 1-12), the number of businesses: (a) In mining etc. decreased in 2008-13 (down 28%, marginally in 2008-09), possibly increased in 2013-14,[4] and decreased again in 2014-17 (down 30%, marginally in 2015-16).[9] In conjunction with the evolution of the number of people

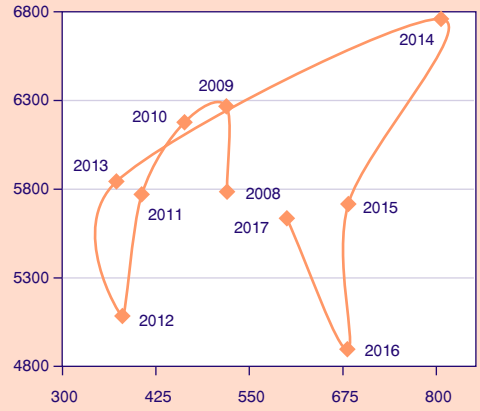
8. If the new method of calculating the data after the break is consistent with the initial method (i.e., if the result does not differ much from the result of the initial method), then the market probably ended up at a higher level of employment and a higher average wage compared to the beginning of the period.

9. If the new method of calculating the data after the break is consistent with the initial method (i.e., if the result does not differ much from the result of the initial method), then the sector ended up with more businesses compared to the beginning of the period.

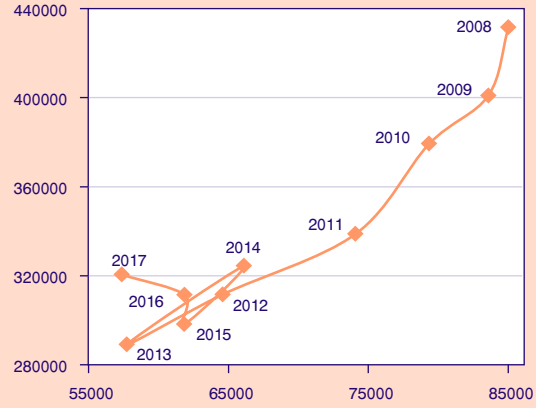
FIGURES 6

The evolution of the number of businesses and of the number of employed people (on the horizontal and the vertical axis, respectively): Greece, 2008-17

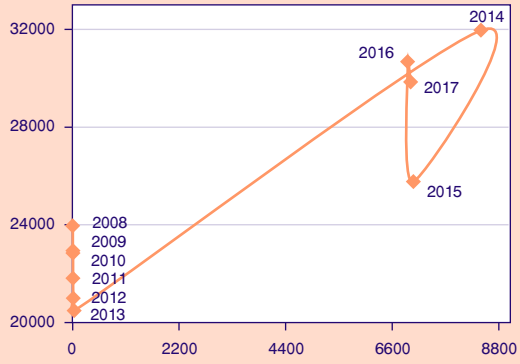
1. Mining-quarrying



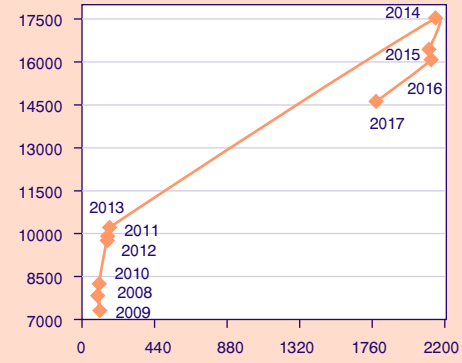
2. Manufacturing



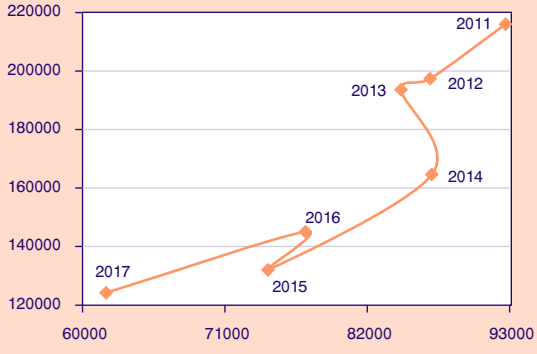
3. Electricity etc.



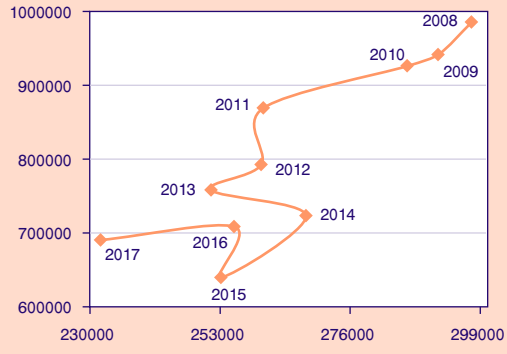
4. Water supply etc.



5. Construction

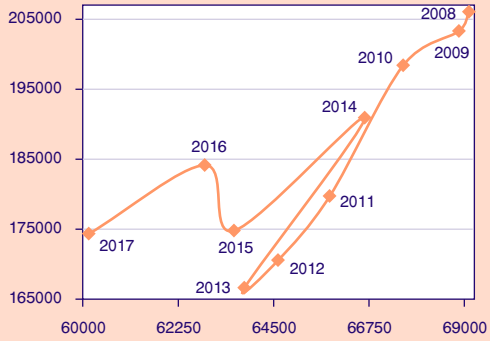


6. Trade-repair of motor vehicles

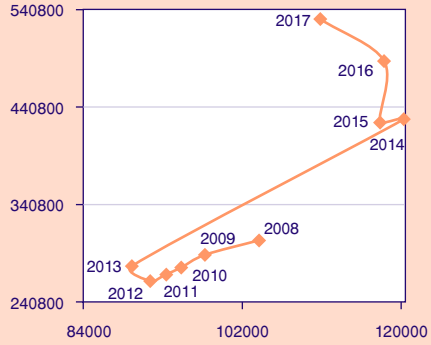


FIGURES 6 (continued)

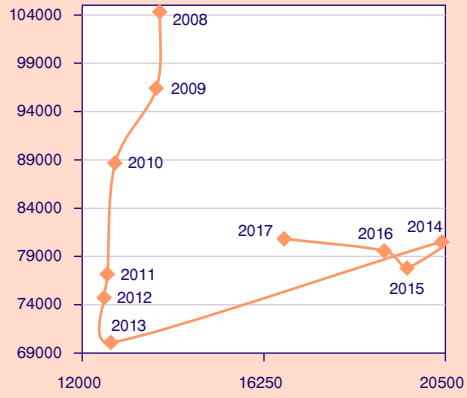
7. Transportation-storage



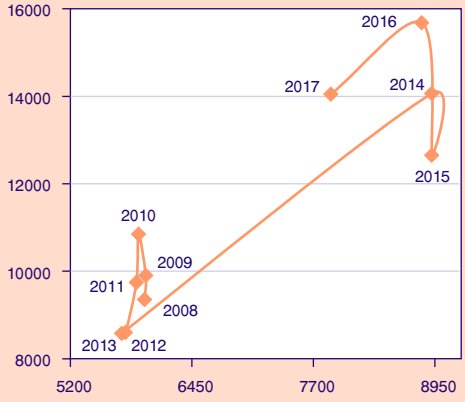
8. Accommodation-food service



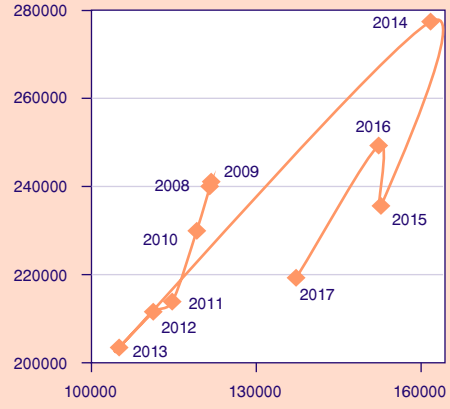
9. Information-communication



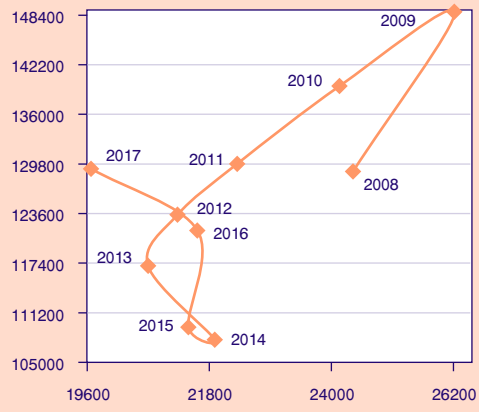
10. Real estate



11. Professional activities etc.



12. Administrative activities etc.



Source: See Figure 2.

employed, it turns out that, on average, the business size in terms of staff increased from 11 to 16 people in 2008-13, and from 8 to 9 people in 2014-17. (b) In manufacturing decreased in 2008-13 (down 32%), possibly increased in 2013-14,[4] decreased again in 2014-15, increased in 2015-16, and decreased once again in 2016-17 (down 14% between 2014-17).[10] In addition, it turns out that, on average, the business size in terms of staff remained stable at 5 people in 2008-13, and increased from 5 to 6 people in 2014-17. (c) In electricity etc. increased in 2008-10 (marginally in 2008-09) in the context of the market's opening up to competition, remained stable in 2010-11, increased again in 2011-13 and, possibly, in 2013-14[4] (up 540% in 2008-13), decreased in 2014-16 and increased once again in 2016-17 (down 21% in 2014-17).[9] In addition, it turns out that, on average, the business size in terms of staff decreased from 4.8 thousand to 640 people in 2008-13, and remained stable at 4 people in 2014-17. (d) In water supply etc. increased in 2008-2009, decreased in 2009-10, increased again in 2010-11, decreased marginally in 2011-12, increased in 2012-13 and, possibly, in 2013-14[4] (up 75% in 2008-13), decreased in 2014-15, increased once again in 2015-16, and decreased in 2016-17 (down 17% in 2014-17).[9] In addition, it turns out that, on average, the business size in terms of staff decreased from 82 to 62 in 2008-13, and remained stable at 8 people in 2014-17. (e) In construction decreased in 2011-13 (down 9%), possibly increased in 2013-14,[4] decreased again in 2014-15, increased in 2015-16, and decreased once again in 2016-17 (down 34% in 2014-17).[10] In addition, it turns out that, on average, the business size in terms of staff remained stable at 2 people. (f) In trade etc. decreased in 2008-13 (down 15%), possibly increased in 2013-14,[4] decreased again in 2014-15, increased in 2015-16, and decreased once again in 2016-17 (down 14% in 2014 -17).[10] In addition, it turns out that, on average, the business size in terms of staff remained stable at 3 people. (g) In transportation etc. decreased in 2008-13 (down 8%), possibly increased in 2013-14,[4] and decreased again in 2014-17 (down 10%).[10] In addition, it turns out that, on average, the business size in terms of staff remained stable at 3 people. (h) In accommodation etc. decreased in 2008-13 (down 14%), possibly increased in 2013-14,[4] decreased again in 2014-15, increased in 2015-16, and decreased once again in 2014-17 (down 8% in 2014-17).[9] In addition, it turns out that, on average, the business size in terms of staff remained stable at 3 people in 2008-13, and increased from 4 to 5 people in 2014-17. (i) In information etc. decreased in 2008-12, increased in 2012-13 and, possibly, in 2013-14[4] (down 8% in 2008-13), and decreased again in 2014-17 (down 19%).[9] In addition, it turns out that, on average, the business size in terms of staff decreased from 8 to 6 people in 2008-13, and increased from 4 to 5 people in 2014-17. (j) In real estate increased in 2008-09, decreased in 2009-13 (down 4% in 2008-13), possibly increased in 2013-14,[4] increased marginally in 2014-15, and decreased again in 2015-17 (down 12% in 2014-17).[9] In addition, it turns out that, on average, the business size in terms of staff decreased from 2 people to 1 person in 2008-13, and ranged between 1 person and 2 people in 2014-16, ending up at 2 people in 2017. (k) In professional activities etc. increased in 2008-09, decreased in 2009-13 (down 14% in 2008-13), possibly increased in 2013-14,[4] and decreased again in 2014-17 (down 16% 2014-17).[9] In addition, it turns out that, on average, the business size in terms of staff remained stable at 2 people. (l) In administrative activities etc. increased in 2008-09, decreased in 2009-13 (down 15% in 2008-13), possibly increased in 2013-14,[4] decreased again in 2014-15, increased in 2015-16, and decreased once again in 2016-17 (down 10% in 2014-17).[10] In addition, it turns out that, on average, the business size in terms of staff increased from 5 to 6 people in 2008-13, and from 5 to 7 people in 2014-17.

Overall, the number of businesses in: (a) 2008-09 went up in five sectors (water supply, real estate, professional activities etc., administrative activities etc., marginally in electricity etc.), down in the other sectors (marginally in mining etc.), and down overall. (b) 2009-10 went slightly up in electricity etc., down in the other sectors, and down overall. (c) 2010-11 went slightly up in water supply etc., remained stable in electricity etc., went down in the other sectors, and down overall. (d) 2011-12 went up in electricity etc., down in the other sectors (marginally in water supply etc.), and down overall. (e) 2012-13 went up in three sectors (water supply etc., electricity etc., information etc.), down in the other sectors, and down overall. (f) 2013-14 may have gone up in all sectors.[4] (g) 2014-15 went marginally up in real estate, down in the other sectors, and down overall. (h) 2015-16 went up in six sectors (manufacturing, water supply etc., construction, trade etc.,

10. If the new method of calculating the data after the break is consistent with the initial method (i.e., if the result does not differ much from the result of the initial method), then the sector ended up with fewer businesses compared to the beginning of the period.

TABLE 1 The cases in which the labor markets were dominated by rightward demand shifts: Greece, 2008-13 and 2014-17

	Number of businesses	Average business size	Labor productivity, profitability	Sectors	Year
1	↑	↑	↓	Construction	2015-16
2	↑	↑	↓	Trade etc.	2015-16
3	↑	↑	↓	Professional activities etc.	2008-09
4	↓	↑	↓	Transportation etc.	2015-16
5	↓	↑	↓	Information etc.	2016-17
6	↓	↑	↓	Real estate	2009-10
7	↓	↑	↓	Professional activities etc.	2015-16
8	↓	↑	↓	Administrative activities etc.	2016-17
9	↓	↑	↑	Mining-quarrying	2016-17
10	↓	↑	↑	Manufacturing	2016-17
11	↓	↑	↑	Administrative activities etc.	2014-15
12	↑	↑	↑	Real estate	2008-09

Source: See Figure 2.

accommodation etc., administrative activities etc.), down in the other sectors (marginally in mining etc.), and up overall. (i) 2016-17 went up in electricity etc., down in the other sectors, and down overall.

The average size of businesses in terms of staff, generally: (i) Decreased considerably in two sectors (electricity etc., water supply etc.), decreased slightly or marginally in five sectors (manufacturing, trade etc., transportation etc., information etc., real estate), and increased slightly or marginally in the other five sectors during 2008-13. (ii) May have decreased considerably in two of the sectors mentioned above (electricity etc., water supply etc.), decreased slightly or marginally in seven sectors, and increased slightly or marginally in the other three sectors (transportation etc., accommodation etc., real estate) in 2013-14.[4] (iii) Decreased marginally in professional activities etc., and increased marginally in the other eleven sectors during 2014-17.

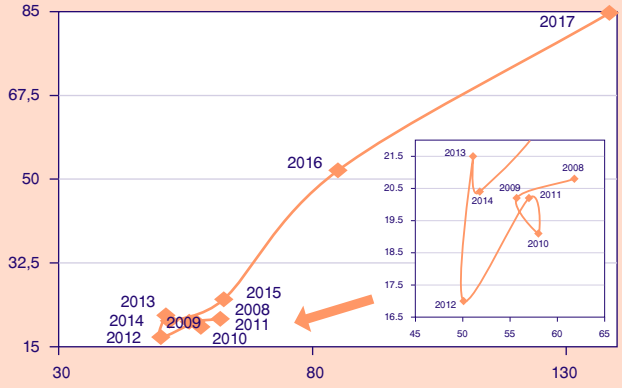
In addition, the 2008-13 and 2014-17 statistics show that: (i) The smallest drops in the number of businesses occurred in sectors with relatively few businesses at the beginning of the period in question: primarily in water supply etc., secondarily in mining etc. (ii) The largest drops in the number of businesses occurred in sectors with relatively many businesses at the beginning of the period: primarily in trade etc., secondarily in professional activities etc. (iii) The largest rises in the average size of businesses occurred in sectors that featured relatively large and medium-sized businesses in terms of staff at the beginning of the period: primarily in mining etc., secondarily in administrative activities etc. (iv) The largest falls in the average size of business occurred in the sectors that featured the largest businesses in terms of staff at the beginning of the period: primarily in electricity etc., secondarily in water supply etc. It also turns out that in all twelve times that the labor market was dominated by a rightward demand shift, in the same year, the average size of businesses in the sector grew in terms of staff. (See Table 1.)

5. Developments in labor productivity and profitability in the twelve sectors

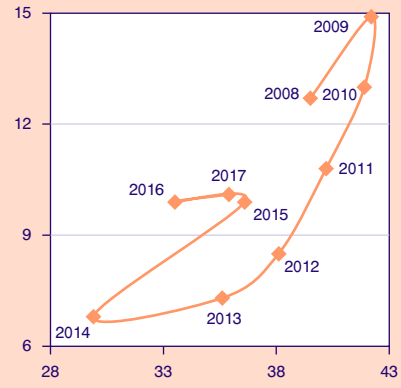
The business performance data (Figures 7: 1-12) show that labor productivity: (a) In mining etc. decreased in 2008-2009, increased in 2009-10, decreased again in 2010-12, increased in 2012-13 and, possibly, in 2013-

FIGURES 7
The evolution of labor productivity and of the profitability measure (on the horizontal and the vertical axis, respectively; both in %): Greece, 2008-17

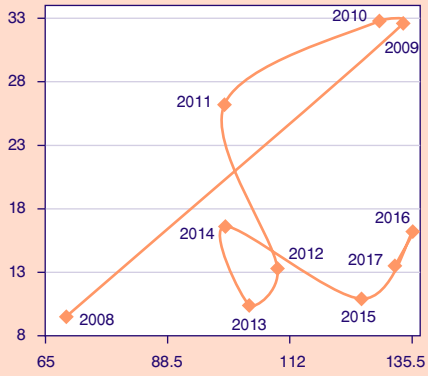
1. Mining-quarrying



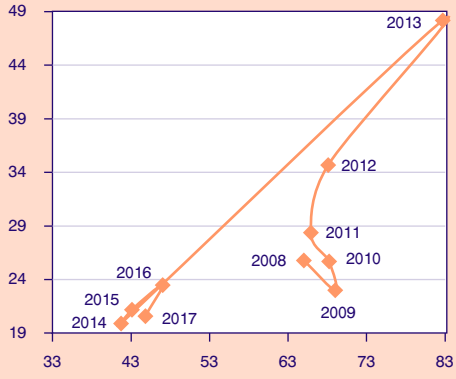
2. Manufacturing



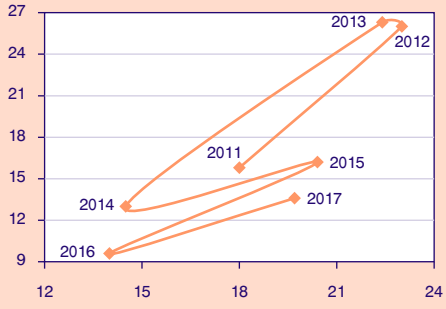
3. Electricity etc.



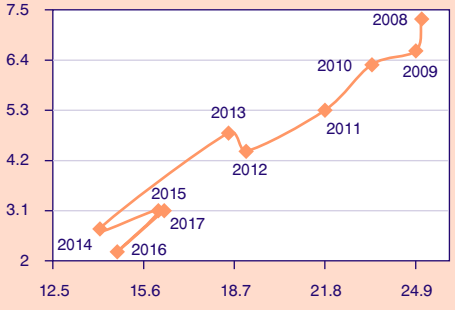
4. Water supply etc.



5. Construction

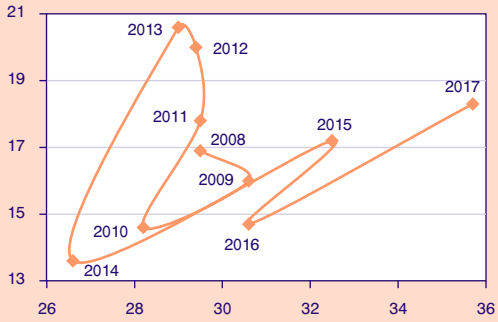


6. Trade-repair of motor vehicles

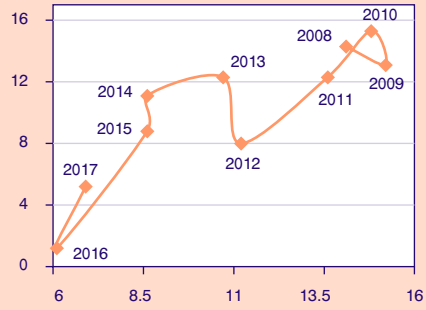


FIGURES 7 (continued)

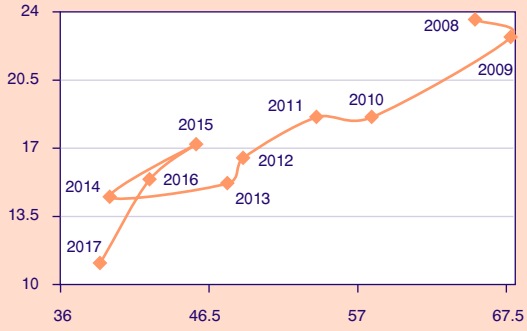
7. Transportation-storage



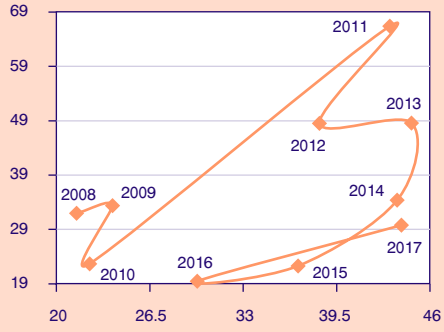
8. Accommodation-food service



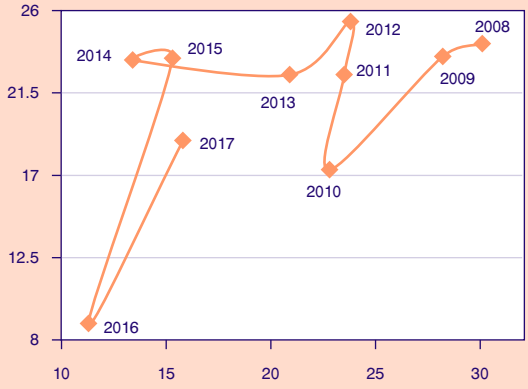
9. Information-communication



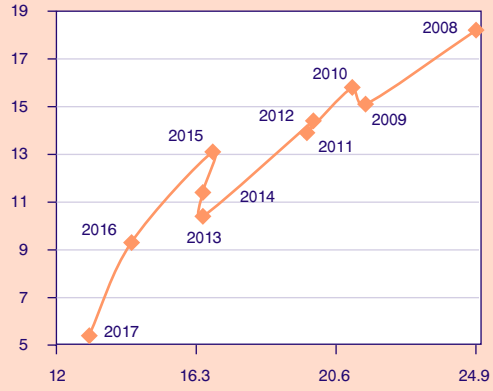
10. Real estate



11. Professional activities etc.



12. Administrative activities etc.



Source: See Figure 2.

14[4] (down 17% in 2008-13), and increased in 2014-17 (up 167%).[11] (b) In manufacturing increased in 2008-09, decreased in 2009-13 (marginally in 2009-10) and, possibly, in 2013-14[4] (down 10% in 2008-13), increased again in 2014-15, decreased in 2015-16, and increased once again in 2016-17 (up 20% in 2014-17).[12] (c) In electricity etc. increased in 2008-09, decreased in 2009-11, increased again in 2011-12, decreased in 2012-13 and, possibly, in 2013-14[4] (up 51% in 2008-13), increased once again in 2014-16, and decreased in 2016-17 (up 33% in 2014-17).[11] (d) In water supply etc. increased in 2008-2009, decreased in 2009-11, increased again in 2011-13 (up 27% in 2008-13), possibly decreased in 2013-14,[4] increased once again in 2014-16, and decreased in 2016-17 (up 7% in 2014-17).[12] (e) In construction increased in 2011-12, decreased in 2012-13 and, possibly, in 2013-14[4] (up 24% in 2011-13), increased again in 2014-15, decreased in 2015-16, and increased once again in 2016-17 (up 36% in 2014-17).[11] (f) In trade etc. decreased in 2008-13 (marginally in 2008-09) and, possibly, in 2013-14[4] (down 26% in 2008-13), increased in 2014-15, decreased again in 2015-16, and increased in 2016-17 (up 16% in 2014-17).[12] (g) In transportation etc. increased in 2008-09, decreased in 2009-10, increased again in 2010-11, decreased in 2011-13 (marginally in both years) and, possibly, in 2013-14[4] (down 2% in 2008-13), increased in 2014-15, decreased in 2015-16, and increased once again in 2016-17 (up 34% in 2014-17).[11] (h) In accommodation etc. increased in 2008-09, decreased in 2009-13 (marginally in 2009-10) and, possibly, in 2013-14[4] (down 24% in 2008-13), remained stable in 2014-15, decreased again in 2015-16, and increased in 2016-17 (down 20% in 2014-17).[12] (i) In information etc. increased in 2008-09, decreased in 2009-13 and, possibly, in 2013-14[4] (down 27% in 2008-13), increased again in 2014-15, and decreased in 2015-17 (down 2% in 2014-17).[12] (j) In real estate increased in 2008-09, decreased in 2009-10, increased again in 2010-11, decreased in 2011-12, increased in 2012-13 (up 109% is 2008-13), possibly decreased in 2013-14,[4] decreased in 2014-16, and increased once again in 2016-17 (up marginally in 2014-17).[11] (k) In professional activities etc. decreased in 2008-10, increased in 2010-12 (marginally in 2011-12), decreased again in 2012-13 and, possibly, in 2013-14[4] (down 31% in 2008-13), increased in 2014-15, decreased once again in 2015-16, and increased in 2016-17 (up 18% in 2014-17).[12] (l) In administrative activities etc. decreased in 2008-11 (marginally in 2009-10), increased marginally in 2011-12, decreased again in 2012-13 (down 34% in 2008-13), possibly remained stable in 2013-14,[4] increased marginally in 2014-15, and decreased once again in 2015-17 (down 21% in 2014-17).[12]

It turns out that labor productivity in: (a) 2008-09 went down in four sectors (mining etc., professional activities etc., administrative activities etc., marginally in trade etc.) and up in seven sectors. (b) 2009-10 went down in ten sectors (marginally in manufacturing, accommodation etc., administrative activities etc.) and up in mining etc. (c) 2010-11 went down in eight sectors and up in three sectors (transportation etc., real estate, professional activities etc.). (d) 2011-12 went down in seven sectors (marginally in transportation etc.) and up in five sectors (electricity etc., water supply etc., construction and, marginally, in professional etc., and administrative activities etc.). (e) 2012-13 went down in nine sectors (marginally in transportation etc.) and up in three sectors (mining etc., water supply etc., real estate). (f) 2013-14 may have gone down in ten sectors, may have remained stable in administrative activities etc., and may have gone up in mining etc.[4] (g) 2014-15 went down in real estate, remained stable in accommodation etc., and went up in ten sectors (marginally in administrative activities etc.). (h) 2015-16 went down in nine sectors and up in three sectors (mining etc., electricity etc., water supply etc.). (i) 2016-17 went down in four sectors (electricity etc., water supply etc., information etc., administrative activities etc.) and up in eight sectors.

The profitability measure: (a) In mining etc. decreased in 2008-2010, increased in 2010-11, decreased again in 2011-12, increased in 2012-13, possibly decreased in 2013-14[4] (up 3% in 2008-13), and increased in 2014-17 (up 315%).[13] (b) In manufacturing increased in 2008-09, decreased in 2009-13 (down 43% in 2008-13), possibly decreased in 2013-14,[4] increased again in 2014-15, remained stable in 2015-16, and increased

11. If the new method of calculating the data after the break is consistent with the initial method (i.e., if the result does not differ much from the result of the initial method), then the sector ended up at a higher level of productivity compared to the beginning of the period.

12. If the new method of calculating the data after the break is consistent with the initial method (i.e., if the result does not differ much from the result of the initial method), then the sector ended up at a lower level of productivity compared to the beginning of the period.

13. If the new method of calculating the data after the break is consistent with the initial method (i.e., if the result does not differ much from the result of the initial method), then the sector ended up at a higher level of the profitability measure employed compared to the beginning of the period.

marginally in 2016-17 (up 49% in 2014-17).[14] (c) In electricity etc. increased in 2008-10 (marginally in 2009-10), decreased in 2010-13 (up 9% in 2008-13), possibly increased in 2013-14,[4] decreased again in 2014-15, increased in 2015-16, and decreased once again in 2016-17 (down 19% in 2014-17).[13] (d) In water supply etc. decreased in 2008-2009, increased in 2009-13 (up 87% in 2008-13), possibly decreased in 2013-14,[4] increased again in 2014-16, and decreased in 2016-17 (up 4% in 2014-17).[14] (e) In construction increased in 2011-13 (up 66%, marginally in 2012-13), possibly decreased in 2013-14,[4] increased again in 2014-15, decreased in 2015-16, and increased once again in 2016-17 (up 5% in 2014-17).[14] (f) In trade etc. decreased in 2008-12 (marginally in 2009-10), increased marginally in 2012-13 (down 34% in 2008-13), possibly decreased in 2013-14,[4] increased marginally again in 2014-15, decreased in 2015-16, and increased once again in 2016-17 (up 15% in 2014-17).[14] (g) In transportation etc. decreased in 2008-10 (marginally in 2008-09), increased in 2010-13 (marginally in 2012-13), possibly decreased in 2013-14[4] (up 22% in 2008-13), increased again in 2014-15, decreased in 2015-16, and increased once again in 2016-17 (up 35% in 2014-17).[13] (h) In accommodation etc. decreased in 2008-09, increased in 2009-10, decreased again in 2010-12, increased in 2012-13 (down 14% in 2008-13), possibly decreased in 2013-14,[4] decreased once again in 2014-16, and increased in 2016-17 (down 53% in 2014-17).[14] (i) In information etc. decreased in 2008-10, remained stable in 2010-11, decreased again in 2011-13 and, possibly in 2013-14[4] (down 36% in 2008-13), increased in 2014-15, and decreased once again in 2015-17 (down 23% in 2014-17).[14] (j) In real estate increased in 2008-09, decreased in 2009-10, increased again in 2010-11, decreased in 2011-12, increased marginally in 2012-13 (up 52% in 2008-13), possibly decreased in 2013-14,[4] decreased in 2014-16, and increased once again in 2016-17 (down 13% in 2014-17).[14] (k) In professional activities etc. decreased in 2008-10, increased in 2010-12, decreased again in 2012-13 (down 7% in 2008-13), possibly increased in 2013-14,[4] increased marginally in 2014-15, decreased once again in 2015-16, and increased in 2016-17 (down 19% in 2014-17)[14]. (l) In administrative activities etc. decreased in 2008-09, increased in 2009-10, decreased again in 2010-11, increased in 2011-12, decreased in 2012-13, possibly increased in 2013-14[4] (down 43% in 2008-13), increased in 2014-15, and decreased once again in 2015-17 (down 53% in 2014-17).[14]

It turns out that the measure of profitability in: (a) 2008-09 went down in eight sectors and up in three sectors (manufacturing, electricity etc., real estate). (b) 2009-10 went down in seven sectors (marginally in trade etc.) and up in four sectors (water supply, accommodation etc., administrative activities etc., and, marginally, in electricity etc.). (c) 2010-11 went down in six sectors, up in four sectors (mining etc., water supply etc., transportation etc., real estate), and remained stable in information etc. (d) 2011-12 went down in seven sectors and up in five sectors (construction, water supply etc., transportation etc., professional activities etc., administrative activities etc.). (e) 2012-13 went down in five sectors and up in seven sectors (mining etc., water supply etc., accommodation etc. and, marginally, in construction, trade etc., transportation etc., real estate). (f) 2013-14 may have gone down in nine sectors and may have gone up in three sectors (electricity etc., professional activities etc., administrative activities etc.).[4] (g) 2014-15 went down in three sectors (electricity etc., accommodation etc., real estate) and up in nine sectors (marginally in trade etc. and professional activities etc.). (h) 2015-16 went down in eight sectors, up in three sectors (mining etc., electricity etc., water supply etc.) and remained stable in manufacturing. (i) 2016-17 went down in four sectors (electricity etc., water supply etc., information etc., administrative activities etc.) and up in eight sectors (marginally in manufacturing).

Overall, the 2008-13 and 2014-17 statistics show that: (i) The largest increases in labor productivity occurred in sectors with the highest or very high productivity at the beginning of the period under consideration: primarily in mining etc., secondarily in electricity etc. (ii) The largest decreases in labor productivity occurred in sectors with very high or very low labor productivity at the beginning of the period: primarily in information etc., secondarily in administrative activities etc. (iii) The largest increases in profitability occurred in sectors with low profitability or no profitability at the beginning of the period: primarily in electricity etc., secondarily in construction. (iv) The largest decreases in profitability occurred in sectors with very high or average profitability at the beginning of the period: primarily in accommodation etc., secondarily in manufacturing.

In addition, it turns out that in all cases, in which that the labor market was dominated by a leftward demand shift or a binding reduction of a wage ceiling, and (i) sectoral profitability fell, then labor productivity also fell (19 cases, see Table 2), (ii) sectoral labor productivity

14. If the new method of calculating the data after the break is consistent with the initial method (i.e., if the result does not differ much from the result of the initial method), then the sector ended up at a lower level of the profitability measure employed compared to the beginning of the period.

TABLE 2 The cases in which the labor markets were dominated by leftward demand shifts and/or binding reductions of wage ceilings: Greece, 2008-13 and 2014-17

	Labor productivity	Profitability	Sectors	Years
1	↓	↓	Mining-quarrying	2011-12
2-4	↓	↓	Manufacturing	2010-11, 2011-12, 2012-13
5-6	↓	↓	Electricity etc.	2010-11, 2016-17
7	↓	↓	Water supply etc.	2016-17
8	↓	↓	Construction	2012-13
9-10	↓	↓	Trade etc.	2009-10,* 2011-12
11	↓	↓	Transportation etc.	2009-10*
12	↓	↓	Accommodation etc.	2011-12
13-15	↓	↓	Information etc.	2010-11,* 2011-12, 2012-13
16-17	↓	↓	Professional activities etc.	2009-10,* 2012-13
18-19	↓	↓	Administrative activities etc.	2010-11, 2012-13
20	↓	↑	Electricity etc.	2009-10*
21	↓	↑	Trade etc.	2012-13
22	↓	↑	Accommodation etc.	2009-10*
23-24	↓	↑	Transportation etc.	2011-12, 2012-13
25	↑	↑	Mining-quarrying	2015-16
26-27	↑	↑	Water supply etc.	2011-12, 2014-15
28	↑	↑	Construction	2011-12
29	↑	↑	Trade etc.	2016-17
30	↑	↑	Transportation etc.	2010-11
31	↑	↑	Real estate	2010-11
32-34	↑	↑	Professional activities etc.	2010-11, 2011-12, 2016-17
35	↑	↑	Administrative activities etc.	2011-12

Source: See Figure 2.

* Pay cuts in the form of wage ceilings were applied in state-controlled enterprises in 2010.

TABLE 3 The cases in which the labor markets were dominated by leftward supply shifts: Greece, 2008-13 and 2014-17

	Labor productivity	Profitability	Sectors	Years
1	↓	↓	Mining-quarrying	2010-11
2	↓	↓	Manufacturing	2009-10
3	↓	↓	Electricity etc.	2012-13
4-5	↓	↓	Trade etc.	2008-09, 2010-11
6	↓	↓	Accommodation etc.	2010-11
7	↓	↓	Information etc.	2009-10
8-9	↓	↓	Real estate	2011-12, 2014-15
10	↓	↓	Administrative activities etc.	2009-10
11	↑	↓	Manufacturing	2008-09
12	↑	↓	Electricity etc.	2011-12
13	↑	↓	Water supply etc.	2008-09
14	↑	↓	Transportation etc.	2008-09
15	↑	↓	Accommodation etc.	2008-09
16	↑	↓	Information etc.	2008-09
17	↑	↓	Professional activities etc.	2014-15
18-19	↑	↑	Mining-quarrying	2009-10, 2014-15
20	↑	↑	Manufacturing	2014-15
21-22	↑	↑	Electricity etc.	2008-09, 2014-15
23	↑	↑	Water supply etc.	2015-16
24-25	↑	↑	Construction	2014-15, 2016-17
26	↑	↑	Trade etc.	2014-15
27-28	↑	↑	Transportation etc.	2014-15, 2016-17
29	↑	↑	Information etc.	2014-15
30-31	↑	↑	Real estate	2012-13, 2016-17
32	–	↓	Accommodation etc.	2014-15

Source: See Figure 2.

TABLE 4 The cases in which the number of businesses in a sector decreased: Greece, 2008-13 and 2014-17

	Average size	Labor market	Sectors	Years
1-2	↓	labor demand ↓	Mining-quarrying	2011-12, 2015-16
3-4	↓	labor demand ↓	Manufacturing	2010-11, 2014-15
5	↓	labor demand ↓	Water supply	2011-12
6	↓	labor demand ↓	Construction	2011-12
7-8	↓	labor demand ↓	Trade etc.	2011-13
9-12	↓	labor demand or wage ceilings ↓	Transportation etc.	2009-13*
13-14	↓	labor demand or wage ceilings ↓	Accommodation etc.	2009-10,* 2011-12
15	↓	labor demand ↓	Information etc.	2010-12
16	↓	labor demand ↓	Real estate	2010-11
17-19	↓	labor demand or wage ceilings ↓	Professional activities etc.	2009-11,* 2016-17
20-22	↓	labor demand ↓	Administrative activities etc.	2011-13
23	↓	labor supply ↓	Mining-quarrying	2014-15
24-26	↓	labor supply ↓	Manufacturing	2008-10, 2014-15
27	↓	labor supply ↓	Electricity etc.	2014-15
28	↓	labor supply ↓	Construction	2014-15
29-30	↓	labor supply ↓	Trade etc.	2008-09, 2014-15
31-33	↓	labor supply ↓	Transportation etc.	2008-09, 2014-15, 2016-17
34	↓	labor supply ↓	Accommodation etc.	2010-11
35-36	↓	labor supply ↓	Information etc.	2008-10
37	↓	labor supply ↓	Real estate	2011-12
38	↓	labor supply ↓	Professional activities etc.	2014-15
39	↑	labor demand ↑	Mining-quarrying	2016-17
40	↑	labor demand ↑	Manufacturing	2016-17
41	↑	labor demand ↑	Transportation etc.	2015-16
42	↑	labor demand ↑	Information etc.	2016-17

TABLE 4 (continued)

	Average size	Labor market	Sectors	Years
43	↑	labor demand ↑	Real estate	2009-10
44	↑	labor demand ↑	Professional activities etc.	2015-16
45-46	↑	labor demand ↑	Administrative activities etc.	2014-15, 2016-17
47-48	↑	labor demand ↓	Manufacturing	2011-13
49	↑	labor demand ↓	Water supply etc.	2016-17
50	↑	labor demand ↓	Construction	2012-13
51-52	↑	labor demand or wage ceilings ↓	Trade etc.	2009-10,* 2016-17
53-54	↑	labor demand ↓	Professional activities etc.	2011-13
55	↑	labor demand ↓	Administrative activities etc.	2010-11
56-57	↑	labor supply ↑	Mining-quarrying	2008-09, 2012-13
58	↑	labor supply ↑	Electricity etc.	2015-16
59	↑	labor supply ↑	Water supply etc.	2009-10
60-61	↑	labor supply ↑	Accommodation etc.	2012-13, 2016-17
62	↑	labor supply ↑	Information etc.	2015-16
63	↑	labor supply ↑	Real estate	2015-16
64-65	↑	labor supply ↓	Mining-quarrying	2009-11
66	↑	labor supply ↓	Construction	2016-17
67	↑	labor supply ↓	Trade etc.	2010-11
68-69	↑	labor supply ↓	Accommodation etc.	2008-09, 2014-15
70	↑	labor supply ↓	Information etc.	2014-15
71-72	↑	labor supply ↓	Real estate	2012-13, 2016-17
73	↑	labor supply ↓	Administrative activities etc.	2009-10

Source: See Figure 2.

* Pay cuts in the form of wage ceilings were applied in state-controlled enterprises in 2010.

TABLE 5 The cases in which the sectoral average business size in terms of personnel decreased: Greece, 2008-13 and 2014-17

	Profitability	Labor market	Sectors	Years
1	↓	labor demand ↓	Mining-quarrying	2011-12
2	↓	labor demand ↓	Manufacturing	2010-11
3-4	↓	labor demand ↓	Electricity etc.	2010-11, 2016-17
5	↓	labor demand ↓	Trade etc.	2011-12
6	↓	labor demand or wage ceilings ↓	Transportation etc.	2009-10*
7	↓	labor demand ↓	Accommodation etc.	2011-12
8-10	↓	labor demand ↓	Information etc.	2010-13
11	↓	labor demand or wage ceilings ↓	Professional activities etc.	2009-10*
12	↓	labor demand ↓	Administrative activities etc.	2012-13
13-14	↓	labor supply ↓	Manufacturing	2008-10
15-16	↓	labor supply ↓	Electricity etc.	2011-13
17	↓	labor supply ↓	Water supply etc.	2008-09
18	↓	labor supply ↓	Trade etc.	2008-09
19	↓	labor supply ↓	Transportation etc.	2008-09
20	↓	labor supply ↓	Accommodation etc.	2010-11
21-22	↓	labor supply ↓	Information etc.	2008-10
23-24	↓	labor supply ↓	Real estate	2011-12, 2014-15
25	↓	labor supply ↓	Professional activities etc.	2014-15
26	↑	labor demand ↓	Mining-quarrying	2015-16
27	↑	labor demand or wage ceilings ↓	Electricity etc.	2009-10*
28-29	↑	labor demand ↓	Water supply etc.	2011-12, 2014-15
30	↑	labor demand ↓	Construction	2011-12
31	↑	labor demand ↓	Trade etc.	2012-13
32-34	↑	labor demand ↓	Transportation etc.	2010-13
35	↑	labor demand or wage ceilings ↓	Accommodation etc.	2009-10*
36	↑	labor demand ↓	Real estate	2010-11

TABLE 5 (continued)

	Profitability	Labor market	Sectors	Years
37-38	↑	labor demand ↓	Professional activities etc.	2010-11, 2016-17
39	↑	labor demand ↓	Administrative activities etc.	2011-12
40-41	↑	labor supply ↑	Water supply etc.	2010-11, 2012-13
42	↑	labor supply ↓	Mining-quarrying	2014-15
43	↑	labor supply ↓	Manufacturing	2014-15
44-45	↑	labor supply ↓	Electricity etc.	2008-09, 2014-15
46	↑	labor supply ↓	Water supply etc..	2015-16
47	↑	labor supply ↓	Construction	2014-15
48	↑	labor supply ↓	Trade etc.	2014-15
49-50	↑	labor supply ↓	Transportation etc.	2014-15, 2016-17

Source: See Figure 2.

* Pay cuts in the form of wage ceilings were applied in state-controlled enterprises in 2010.

rose, then profitability also rose (11 cases). In all 14 cases that the labor market was dominated by a leftward supply shift and sectoral profitability rose, labor productivity also rose (see Table 3). In all 38 cases that both the number of businesses and the average size of businesses in a sector fell, the labor market was dominated by a leftward demand shift or a binding reduction of a wage ceiling, and, consequently, by a reduction in employment (see Table 4). In all 25 cases that both the average size of businesses and sectoral profitability fell, the labor market was dominated by a leftward demand shift or a binding reduction of a wage ceiling, and, consequently, by a reduction in employment (see Table 5).

6. Similarities with developments elsewhere in the European Union

It may not be appropriate to attribute the above developments exclusively to the recession or to domestic factors, especially if similarities appear in other EU countries. That is, economies whose sectors operate under an increasingly converging legal, market competition, financial, export, and macroeconomic framework. The most conspicuous similarities involve the ups and downs in the numbers of businesses and staff numbers (a) in manufacturing in Greece, Spain, Italy, and Croatia, and (b) in trade etc. in Greece and Croatia (Figures 8: 1-2)[15].

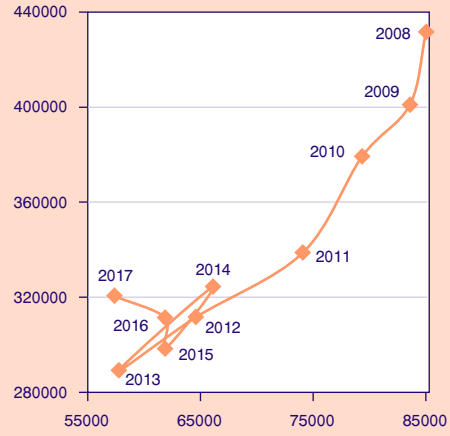
The said similarities go beyond the duration of the downturns in these countries. In Greece, the GDP contracted for eight successive years, in Spain for four years, in Italy for three years, in Croatia for five years; in both Greece and Croatia employment contracted for five matching years, in Spain it contracted for six years, and in Italy for four years. However, the evolution of staff numbers over time in Italian manufacturing differs from the evolution of employment in Italy, and is more similar to the evolution of staff numbers in Greek manufacturing. The evolution of the number of businesses in Italian manufacturing differs from the evolution of the Italian GDP, and is more similar to the

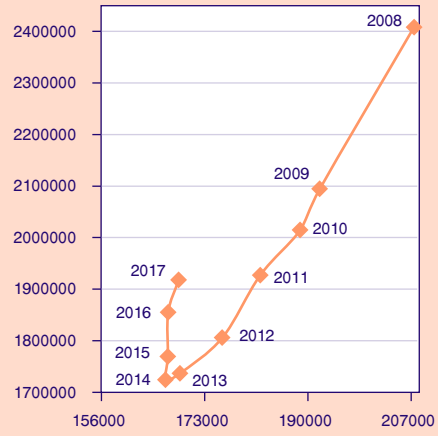
15. The latter sector was the largest in terms of personnel and business numbers at the beginning of the period in Greece, and the former sector was the second largest in terms of personnel at the beginning of the period.

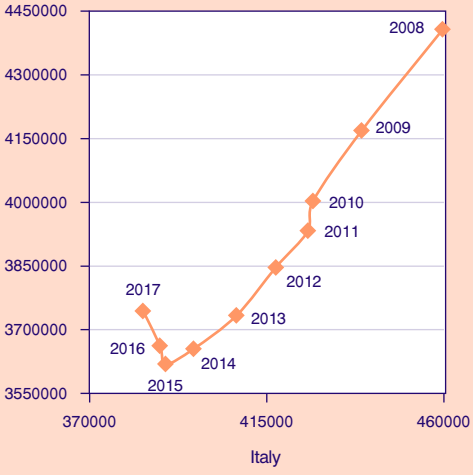
FIGURES 8

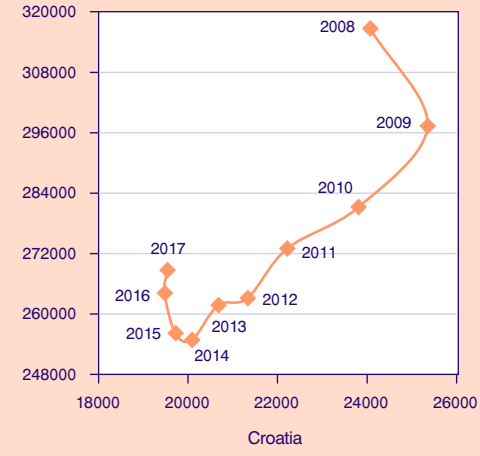
Similar patterns in the development of the number of businesses and of the number of employed people (on the horizontal and on the vertical axis, respectively): 2008-17

1. Manufacturing

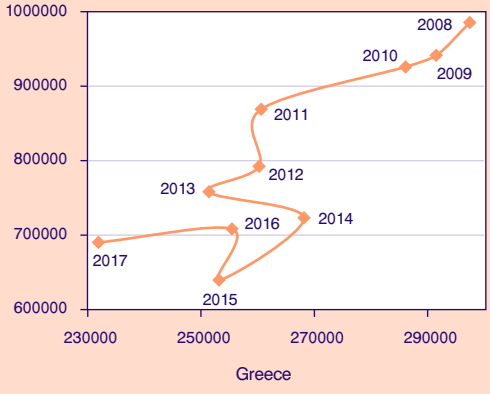


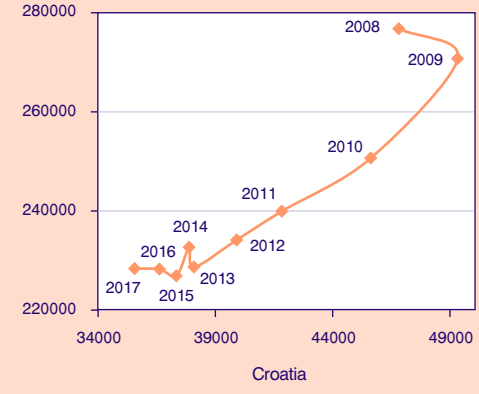






2. Trade-repair of motor vehicles etc.



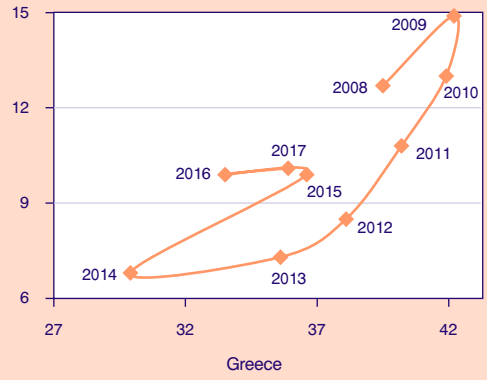


Source: See Figure 2.

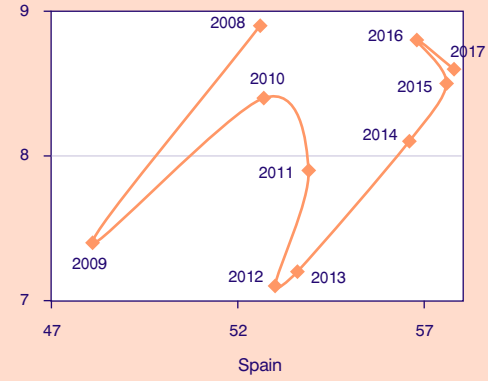
FIGURES 9

Comparison of select labor productivity and profitability patterns (on the horizontal and on the vertical axis, respectively): 2008-17

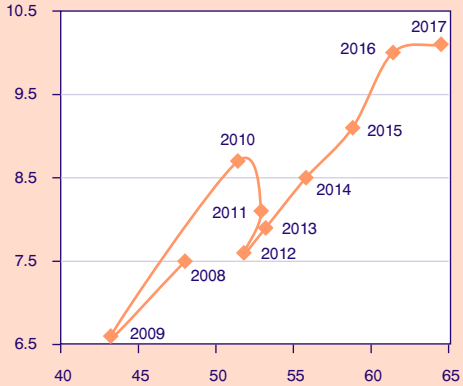
1. Manufacturing



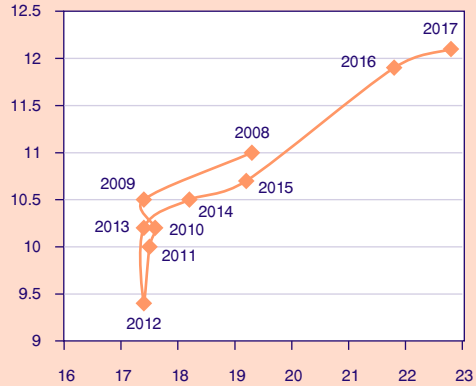
Greece



Spain

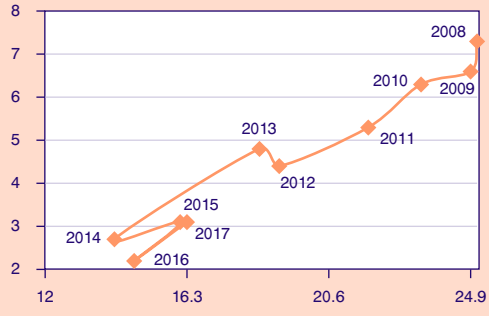


Italy

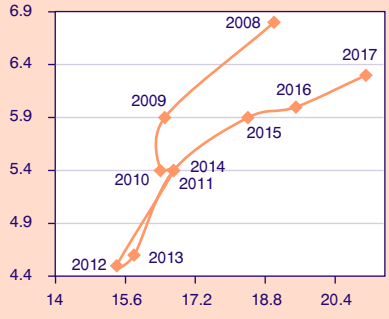


Croatia

2. Trade-repair of motor vehicles etc.



Greece



Croatia

Source: See Figure 2.

evolution of the number of businesses in Greek manufacturing. The evolution of the number of businesses in Croatian trade etc. differs from the evolution of the Croatian GDP, and is more similar to the evolution of the number of businesses in Greek trade etc. The evolution of staff numbers in Greek trade etc. differs from the evolution of employment in Greece and is more similar to the evolution of the corresponding number in Croatian trade etc.

At the same time, the profitability measure in Greek manufacturing remained higher than in Italian and Spanish manufacturing, but fell below the profitability measure in Croatian manufacturing. Labor productivity in Greek manufacturing also fell, but remained higher than labor productivity in Croatian manufacturing.[16] Both profitability and labor productivity measures in Greek trade etc. fell compared to Croatia, and in Croatia they recovered after 2012. (See Figures 9.)

7. Conclusions

On the basis of the official 2008-13 and 2014-17 statistics, we deduce that the twelve sectors of Greece's *business economy,* along with their respective labor markets, moved at different paces and/or in different ways during the period in question. For instance, while employment generally decreased in trade etc. and in manufacturing, and in all twelve sectors during 2011-12, by the end of the period, employment had increased in accommodation etc. and in administrative activities etc. While many businesses exited trade and professional activities etc. (which, in turn, may have adversely affected competition in the respective markets), and during 2014-15 numbers fell in all sectors except one, rather few business exited the water supply etc. sector or mining-quarrying. While the average size of businesses in terms of personnel increased in mining-quarrying and in administrative activities etc., it decreased in electricity etc. and in water supply etc. While labor productivity increased in mining etc. and in electricity etc., it fell in information etc. and in administrative activities etc. While the profitability measure increased in electricity etc. and in construction, it decreased in accommodation etc. and in manufacturing.

In addition, we find that: (a) whenever the labor market was dominated by a leftward demand shift or a binding reduction of a wage ceiling, and profitability fell, labor productivity also fell. (b) Whenever both the number and the average size of businesses in a sector fell, the respective labor market was or had been dominated by a leftward demand shift or a binding reduction of a binding wage ceiling, and, consequently, by a reduction in employment. (c) Whenever both the average size of businesses and sectoral profitability fell, the labor market was or had been dominated by a leftward demand shift or a binding reduction of a wage ceiling, and, hence, by a reduction in employment. (d) The developments in the number of businesses and employees in manufacturing and trade etc. resemble (are similar to the) patterns in other EU Member States.

When more data become available about the sectoral responses and reactions to the pandemic, to the steps taken by the authorities, and to the Recovery and Resilience or other expansionary interventions, we will revisit the issue and report our findings on the operation of the *business economy* in general.

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