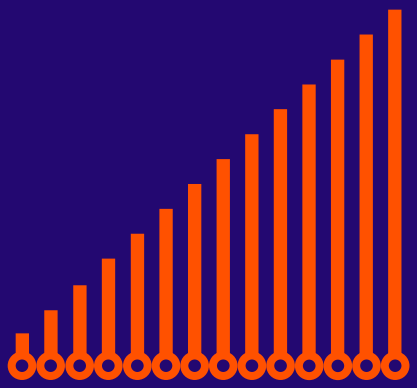
CENTRE OF PLANNING AND ECONOMIC RESEARCH

Issue 43, October 2020

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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Contents

Issue 43 - October 2020

Executive Summary

The **economy** passed through the first wave of the Covid-19 pandemic (first semester of 2020) with the ***lowest possible negative consequences,*** which, however, were distributed rather asymmetrically. Private consumption, whose importance in sustaining aggregate demand is crucial, was negatively affected. However, a closer look at the retail trade data showed that the food items sector was less severely affected by the health crisis, despite the abrupt fall of confidence indices in retail trade. Gross investment fluctuated without any clear-cut trend, although inspection of its components indicated that the construction sector recovered rather quickly, both in real magnitudes and in terms of expectations. Nevertheless, the reversal in the composition of gross investment at the expense of machinery and transport equipment and in favor of buildings might have short-term benefits for the economy as a hedge against the effects of the pandemic, but it does not provide an answer to the long-term question concerning the change in the Greek model of economic development.

The Greek stock market was kept at low levels. Even though the course of the main stock market indices, the capitalization and the KEPE GRIV "fear" index provided encouraging signs in August 2020, the significant decrease in the value of transactions and the strongly negative returns of the banking sector cause concern. In addition, the Greek stock market is facing several challenges that prevent it from following the observed recovery in the international stock markets and hold it at levels much lower than at the beginning of the year.

An important development of the period under examination was Law 4706/2020 on corporate governance and capital market modernization, which was published in July 2020. This development had been expected for several months and is considered particularly positive to further shield the Greek capital market and promote corporate governance in order to strengthen investor confidence. In addition, the successful reissue of the 10-year bond (issued in June 2020) in early September, from which €2.5 billion were raised with a very low interest rate of around 1.2%, ***is a sign of confidence in the Greek economy*** despite the objective difficulties and challenges it is called upon to face. In the same spirit, the issue of the 52-week Greek Government Treasury bill (T-bill) of September 2020 had zero yield, compared to 0.25% for the previous issue of June 2020, while the yield of the 26-week T-bill of August was zero, compared to 0.02% for the previous issue of July 2020. So, it remains for this climate of confidence to be reflected in the course of the stock market.

The following months remain crucial for the course of the domestic and global economies. Obviously, the health crisis has adversely affected the international stock markets. In this context, the Greek stock market should promote growth through business financing in the current difficult economic situation.

The situation in the labour market has worsened, due to the social distancing measures implemented in order to prevent the spread of the coronavirus, deviating from its previous course characterized by increasing employment and decreasing unemployment. The decline in employment in the first six months of 2020 is asymmetrical with respect to population groups, industries and occupations. ***The government moved quickly*** and tried to restrain layoffs and support businesses, both through the SYN-ERGASIA initiative and through ensuring liquidity for firms with the programme of refundable deposits and with lowering rents. However, the insufficient demand, especially from abroad, for goods and services produced locally which typically boost labour supply and increase employment at the second quarter of the year, like tourism (including accommodation and food services), did not leave any room for positive developments.

It is difficult to make predictions about the future of the labour market with so much uncertainty involved. Among others things, developments in the labour market will depend on the intensity of the second wave of the pandemic, which has already started in several European countries. It will also depend on governments' actions, especially those of our main trade partners, the interventions of the Greek government, how soon a vaccine will be available, as well as how soon the situation will be smoothed given that changes in consumer behaviour triggered by the pandemic may last longer than expected. Last but not least, the degree of the economic damage caused by the time a vaccine becomes available will also be of great importance. For instance, how many firms will be forced to shut down or how many will lose their job or a vital share of their income in the process, despite state interven-

tions throughout EU member states. Unfortunately, the adverse situation in the labour market increases the number of inactive persons, either by forcing those who lost their job or/and the unemployed who cannot find work out of the labour force or by delaying the transition to the labour market of those who were already inactive, e.g., youth, students, housewives, etc. Activating these groups and motivating them to re-enter the labour market will be tougher the longer they stay out of the labour force. The reduction of the non-wage cost of labour is expected to relieve firms from some pressure and increase somewhat net earnings for the employed, hence strengthening the demand for goods and services. If these interventions are complemented by targeted tax cuts for industries disproportionately hurt by the pandemic, given that this is possible fiscally and institutionally, multiple benefits should be expected.

There are many uncertainties in the second wave of the pandemic

These are reflected in the draft State Budget 2021 that has already been submitted to Parliament. It is reasonable that there is uncertainty in the estimates of the size of the economic recession precisely because we are still in 'the eye of the storm'. The number of Covid-19 cases are increasing daily, the Intensive Care Units (ICU) are filled with our fellow human beings who need hospitalization, while some others, less fortunate, do not survive. The vaccine has not yet been released, nor has there been any drug that can neutralize the severe symptoms of the virus and the risk of death. So as long as the daily events unfold on "quicksand", economic estimates will be uncertain. Therefore, economic policy actors are doing the right thing by shaping two scenarios for the future course of the economy in 2021: an optimistic one with a growth rate of 7.5% and a pessimistic one with a growth rate of 4.5%. ***Whether we go for the optimistic or the pessimistic scenario will depend on three key factors.*** First of all, it will depend on the final recession rate in 2020. All estimates show that this will be around 8%. However, this will depend on a wide range of factors (see section 1.3). Among these factors are demand and supply dynamics, Greece's export performance, investment and saving decisions by households and enterprises, developments in employment and unemployment and, hence, income, as well as financial conditions and fiscal aggregates. At the same time, these developments are subject to the compensatory effects of the economic measures already implemented and to be implemented in the near future on domestic and international levels. Here we must emphasize that the timing of the beginning of the absorption of the resources of the Recovery Fund is of great importance. Finally, it should be stressed that in early 2020, and before the outbreak of the pandemic, the Greek economy exhibited considerable growth dynamics, while it positively progressed in terms of basic economic aggregates, the rebalancing of major fiscal aggregates and the implementation of crucial reforms. As a result, provided that the pandemic will be effectively managed and the impact of the associated shock will remain short-lived and subside towards the end of the year, the Greek economy is expected to gradually recover and return to positive real GDP growth rates in 2021.

Private debt, which has been a problem for decades and exceeds 230 billion euros, is heading toward a solution

The renewal of the country's bankruptcy law, which was debated for 40 days and will enter into force on January 1, 2021, aims to holistically address the debts of individuals and companies to banks, the State, insurance funds, individuals, etc. The initiative to revamp the country's bankruptcy law ***was necessary and imperative***. Both the new conditions brought about by the successive economic crises of the last decade and the inherent weaknesses of the Greek framework, in combination with the developments at the international level, contributed to this decision. The complexity and maze of legislation in this area did not facilitate the rapid and transparent completion of the relevant procedures, while at the same time it gave the opportunity to strategic defaulters to take advantage of it.

Besides the necessary modernization and specialization for cases such as bona fide debtors belonging to vulnerable groups, there was an urgent need to deal quickly with the over-indebtedness that stifles the economy and often takes the form of non-performing loans. The longer these problems persist, the greater the uncertainty, the larger the devaluation of assets and the more severe the immobilization of banks' balance sheets from non-performing debts becomes, draining the economy from new credit. Therefore, for all the above reasons, ***the bankruptcy law is heading towards the direction of restarting the economy in order to limit the spread of moral hazard, minimize the social impact and maximize the benefits for the economy as a whole***. However, we must point out three factors that demand the attention of policy makers, insofar as they relate to overcoming potential obstacles in order to achieve government policy objectives: First, the automation-standardization of the out-of-court mechanism has the presumption of objec-

tivity, but, at the same time, bears the risk of inefficiency. This might happen because the non-involvement of the human factor is likely to produce results that will not take into account the specificity of each case in order to maximize the expected result under the given specific constraints. Further, the crucial parameter, both in the bankruptcy process and in the liquidation of the assets, is the preservation of the value of these assets so that it does not fall far below their fundamental value. This principle is in the spirit of the provisions. However, securing this principle presupposes a more general set of institutional solutions that will include the comprehensive treatment of the issue of non-performing loans. Finally, in the medium term, the key factor is the change in the way of thinking of economic agents, as this is reflected in their daily behavior. A legislative framework can become a tool to promote economic growth only when it is able to mobilize economic agents in the desired direction. To do this, it must also be able to respond to lingering economic problems with mechanisms that are understood by the general public, while the latter incorporates them into its daily practice and adapts its behavior accordingly. To do this, however, people should be in a position to understand that past ways of thinking are outdated and voluntarily seek to replace old notions with new ones, to the extent that they are deemed as more beneficial. Such attitudes, which stem from established ways of thinking and receive the attention of the policy maker, are the recourse to the informal economy, the distrust in the public sector and the financial system, and a distorted perception of entrepreneurship by some fraction of the society.

Microsoft's decision to invest in Greece shows that under certain conditions Greece can attract even big players

Microsoft's investment in Greece shows a lot: mainly that there is no political risk and that Greece can play an important geopolitical role in the region. It will certainly send a positive message about the country to other companies considering investing in ***Southeast Europe***. However, we must not rest. ***Microsoft alone is not enough*** for our country to return to the international scene. We must strive daily and create the right conditions to attract other foreign investors, which, according to the recent findings of KEPE (see section 1.4), is a move in the right direction to improve the multiplier effects of investments. In addition to the development of domestic production of computers and IT, a long-term investment plan should be aimed at creating incentives for the development of domestic production of electrical and optical products, as well as transport equipment, machinery and other equipment in order to replace imports of the above products as much as possible. After all, the role of investment in the case of the Greek economy is not, as it is strongly emphasized, to contribute to GDP growth in the short term, but to shape a productive model capable of meeting global challenges through appropriate intersectoral planning and the fair distribution of income and sustainability. We must, therefore, strive daily and create suitable conditions for attracting other such investment projects. This is also an institutional challenge.

In the post-coronavirus era, the government will have to deal with three major setbacks

In the battle of man with the coronavirus pandemic, there is a certainty: man will be the winner. In such a case, the pandemic will look like a dramatic parenthesis in society and the economy. Then, in our country, we will have to catch the thread again where we left it before the arrival of the coronavirus. That is, we must face the three main backwardness challenges of our country: the productive, the demographic and the institutional. The ***productive*** backlog is due to the stagnation trap that the country has fallen into due to its commitment to high primary surpluses in order to make its debt sustainable. Targets for primary surpluses of more than 2% only hold the country captive in a recession with exactly the opposite results from what the big surplus fans are seeking or allegedly seeking. It is no coincidence that the official estimates of the institutions for the growth rate of the country until 2060 remain 1.25% when for the rest of the Eurozone it is 2.5%. This means that ***Greeks will gradually become poorer and poorer and overall the country will decline in income***. The second big challenge is ***demographics***. From 2010 onwards, the population has been declining rapidly mainly due to the migration of young people to other countries (see section 3.1). After 2020, due to mass retirement and the aging of the population, there will be 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. 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 the population of Greece will grow older and shrink continuously in the coming years***. The last challenge is the ***institutional one***. It concerns in particular the regulatory quality of the state, the quality of accountability, the rule of law (see section 4.1), the stability and non-use of force, the efficiency of the public administration and

the fight against corruption, where Greece has shown in the last two decades the worst performance compared to other Eurozone countries.

The Pissarides report

Redefining the country's productive model with an emphasis on reforms and changing the incentives of economic actors (e.g., reducing insurance and tax rates) contributes to solving the above problems. It is necessary, however, to enrich the productive model of the Pissarides report with two more characteristics: **resilience and sustainability**. The resilience of the economy refers to the ability to minimize the impact and duration of financial turmoil on income and employment and, consequently, to reduce levels of volatility. ***Resilience is not limited to economic resilience but also to social, environmental and fiscal resilience.*** The resilience of the country under conditions of an economic, social, health or climate crisis largely depends on the adequacy and effectiveness of the structures of the welfare state. This capability includes, inter alia, the preparedness of the health system to deal with pandemics or the effects of natural disasters, the existence of institutionalized mechanisms for providing a decent guaranteed income or guaranteed job, and the timely transition of the education system to quality and accessible digital teaching. In addition, **sustainability** contributes to overall socio-economic resilience and stability, while contributing to the development of sustainable local productive complexes (e.g., short value chains in the agricultural sector, decentralized production of renewable energy sources), energy efficiency (energy savings in the domestic and business sectors) and reducing dependence on external demand (e.g., tourism) by diversifying the domestic productive base and demand.

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

1. Recent (macro-)economic developments

KEPE, *Greek Economic Outlook,* issue 43, 2020, pp. 7-14

1.1. The asymmetric effects of Covid-19 on the main demand components

1.1.1. Introduction – Domestic and external demand

Yannis Panagopoulos

In this section, using the existing recorded macroeconomic data, we proceed to the analysis of the current developments of the Greek economy. The first element we observe, based on the results of Table 1.1.1, are the serious, but expected, negative effects of the Covid-19 pandemic. More specifically, the recession of the economy reached 15.2% in the second quarter of 2020, compared to the corresponding quarter of 2019. Additionally, we measure a serious decline in the growth rate of the economy, on a semester basis. More specifically, from a satisfactory growth rate of 2.2% in the first semester of 2019, we turned to a recession of -7.88% in the corresponding semester of 2020.

Regarding now the factors that contributed to the trend of this GDP recession (-15.2%) in the second quarter of 2020, we observe the existence of high negative percentage rates of change in all individual macroeconomic factors. More specifically, the biggest negative rate of change is recorded for the exports of goods and services (-32.1%) followed, in order of size, by private consumption (-11.6%), fixed capital investment (-10.3%) and public consumption (-3.2%). Special attention should be attributed, at the same time period, to the negative rate of change of imports of goods and services (-17.2%).

Calculating in semester terms, we have almost the same picture with the quarters, but with lower negative rates of change. More specifically, exports of goods and services (-14.8%), fixed capital investment (-8.33%), private consumption (-6.13%) and public consumption (-0.9%) contributed to the recession of the second semester of 2020 with the above order of importance (see Table 1.1.1).

The same general trend is recorded, during the second quarter of 2020, for the *domestic demand*. More analytically, according to the contributing factors of the recession (using seasonally adjusted data), private consumption was the main negative factor with a percentage much higher than that of fixed capital investment and public consumption (-7.75, -1.20 and -0.71, respectively).

Moving now to the contribution of the external (demand) sector with respect to the internal one (international vs. domestic demand), for the recession outcome of the second quarter of 2020, the negative role of domestic demand appears obviously stronger (-10.32 vs. -5.01 respectively, see Figure 1.1.1). This result could have been even worse for the external (demand) sector had the imports of goods and services not appeared with a high negative value (-17.2). Finally, with a slightly positive value, we only record the contribution of the change of Inventories during this quarter (0.33).

Regarding the trend of the Economic Sentiment Index (ESI), as a "proxy" of future demand, it is known that, like some other leading indices, it offers valuable information from the perspective of both business and households concerning the economy. It is also an important indicator for the economy and can be used for the predictions relating to the future of GDP growth. As demonstrated by Figure 1.1.2, the ESI, from January 2020 until August 2020, recorded a strong downward trend, from 109.5 points (January) down to 90.7 points (August). This result is a strong indication of the serious negative impact that the Covid-19 pandemic has created for the expectations of businesses and households.

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 the second quarter of 2020.

TABLE 1.1.1 Basic macroeconomic figures

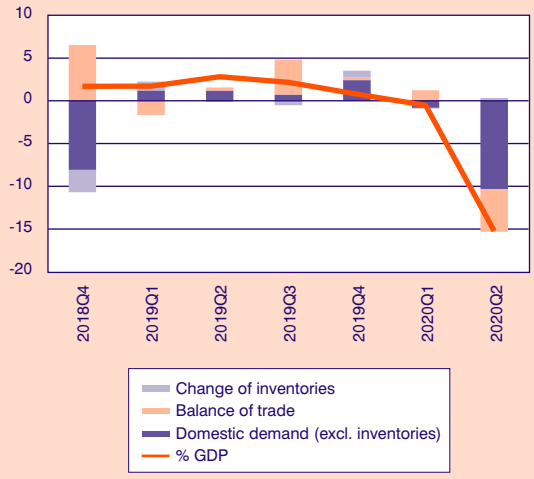
(%, seasonally adjusted data, volumes)

	2018Q1	2018Q2	2018Q3	2018Q4	2019Q1	2019Q2	2019Q3	2019Q4	2020Q1	2020Q2	1st semester 2019	1st semester 2020
											2019	2020
Private consumption	0.5	1.4	1.1	0.7	1.3	0.1	0.3	1.2	-0.7	-11.6	0.67	-6.13
Public consumption	-0.3	-4.1	-4.5	-1.4	0.5	9.8	0.1	-1.4	1.4	-3.2	5.12	-0.94
Fixed capital formation	-8.4	19.4	-22.1	-27.2	8.8	-5.2	2.5	14.0	-6.4	-10.3	1.80	-8.33
Domestic demand*	5.7	3.7	-6.0	-1.0	-0.5	1.6	5.0	2.8	0.4	-15.3	0.55	-7.43
Exports of goods and services	9.1	9.1	5.5	10.6	4.8	5.2	9.1	0.7	2.4	-32.1	5.02	-14.85
Exports of goods	10.3	8.4	6.7	8.1	-0.8	4.7	6.4	-1.4	4.0	-15.4	1.96	-5.69
Exports of services	6.0	12.5	4.8	13.0	10.3	6.9	13.7	1.9	-0.2	-49.4	8.61	-24.80
Imports of goods and services	-7.5	2.7	15.5	2.2	9.8	3.9	-2.8	-0.3	-1.1	-17.2	6.85	-9.18
Imports of goods	-11.4	-0.1	15.4	0.4	10.0	4.3	-4.6	-2.8	-1.2	-15.3	7.17	-8.26
Imports of services	12.0	16.1	16.6	13.2	6.3	2.3	7.6	11.2	-0.6	-25.7	4.32	-13.18
GDP	2.8	1.4	1.8	1.7	1.7	2.8	2.2	0.8	-0.5	-15.2	2.27	-7.88

Source: Quarterly data of the *National Accounts* and EC Forecasting, spring 2019.

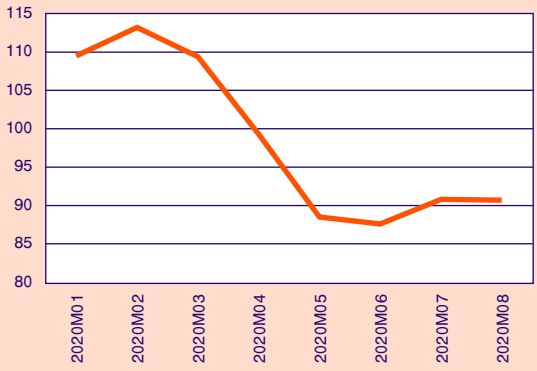
* Excluding inventories.

FIGURE 1.1.1
Domestic and net external demand (components)



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

FIGURE 1.1.2
Economic Sentiment Index



Source: Eurostat.

FIGURE 1.1.3
Components of external demand

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

Trade balance (goods and services)

As expected, the negative contribution of the external sector (exports minus imports) regarding the recession of GDP, for the second quarter of 2020, basically reflects the Covid-19 pandemic consequences on international economic demand.

Thus, we will next present separately the trends regarding the rate of change of goods and services, for both imports and exports, for that period. Starting from the exports, we should underline that they have decreased in the second quarter of 2020, with a very high rate (32.1%). More analytically, services –which are the relatively smaller portion of the total exports in billion euros– demonstrated an annual decrease of 49.4%, while goods –which are most of the exports– experienced a much smaller annual decline of 15.4%. Concerning now the imports of goods and services, unlike the composition of the exports, they are more balanced as a distribution, and additionally, they have been reduced overall with a rate of 17.2%. Additionally, imported services decreased with a rate of 25.7% while, at the same time period, goods deceased with a much smaller rate (15.3%).

Finally, the contribution of the trade balance, at the GDP recession rate, is also reflected in the histograms of Figure 1.1.3, for imports and exports separately. As already mentioned, during this initial period of the Covid-19 pandemic, we had high negative percentage rates for both external demand components (-17.2% and -32.1%, respectively, Table 1.1.1). Consequently, as illustrated in Figure 1.1.3, we observe a very positive contribution of the import component and the corresponding negative contribution of the export component to GDP (6.14 vs. -11.1, respectively). This is an actual reversal of the anticipated histograms concerning the contribution of these two main components of the external demand to GDP growth (and not recession).

1.1.2. Private consumption and investment

Konstantinos Loizos

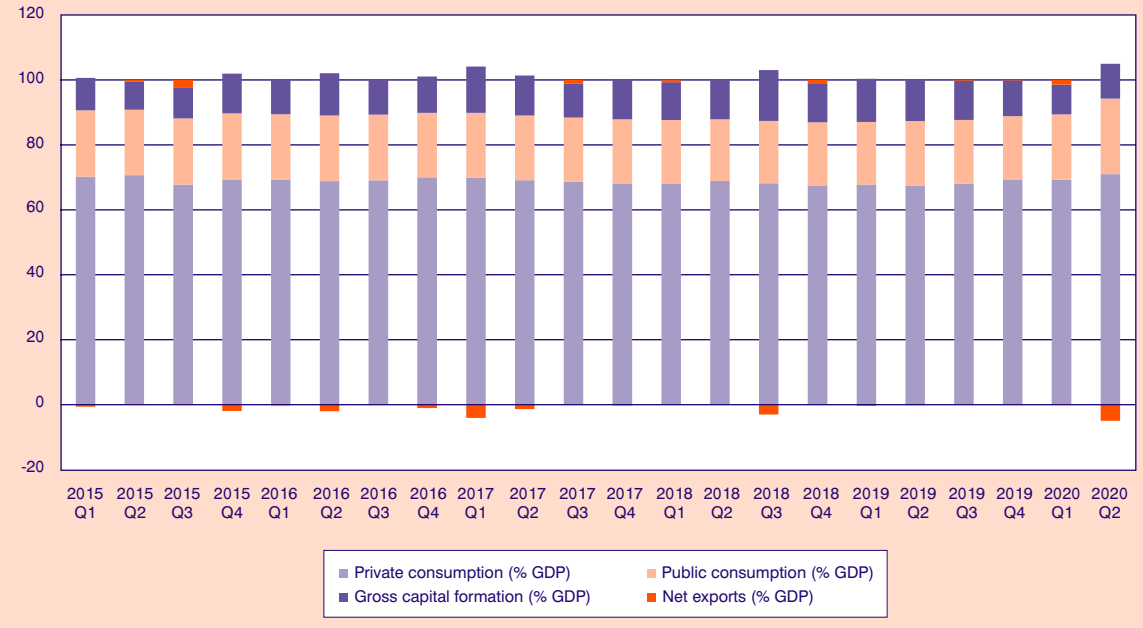
1.1.2.1. Private consumption

Private consumption decreased in value, but it retained its importance as a percentage of GDP

Based on quarterly, seasonally adjusted *National Accounts data,*[1] private consumption decreased to the level of 27,726 million euros in current prices during the second quarter of 2020, from 31,740 million euros in the first quarter of the same year and 32,005 in the fourth quarter of 2019. Similarly, in terms of chain-linked volumes (reference year 2010), private consumption declined from 32,755 million euros in the fourth quarter of 2019 to 32,472 million euros during the first quarter and 28,802 million euros in the second quarter of 2020. This significant fall in consumer spending is reflected in the relevant percentage changes, according to the seasonally-adjusted chain-linked volumes. Private consumption diminished at rates of -0.7% and -11.6% during the first two quarters of 2020 in comparison with the corresponding quarters of 2019, whilst it decreased at similar rates (-0.9% and -11.3%) with respect to the immediately preceding quarters.

Nevertheless, as a percentage of GDP, private consumption increased from 69.18% in the fourth quarter of 2019 to 69.27% in the first quarter of 2020 and 70.97% in the second quarter of the same year (Figure 1.1.4). There was also a significant rising trend in public consumption as a percentage of GDP (from 19.69% to 20.13% and 23.28% in the respective quarters). However, even though both private and public consumption maintained their importance as percentages of GDP, the same variables as components of aggregate domestic demand fell sharply during the second quarter of 2020 (Figure 1.1.5). In addition, the data about gross capital formation (gross fixed capital formation and changes in inventories) as a percentage of GDP fluctuate without any clear trend: from 10.99% in the fourth quarter of 2019, gross investment fell to 9.15% in the first quarter of 2020, only to rise again to 10.75% in the second quarter. Finally, net exports, despite a small rebound from 0.14% to 1.44% of GDP in the first

FIGURE 1.1.4
The evolution of private consumption and other components of demand as percentages of GDP
(expenditure approach) (seasonally adjusted data in current prices)

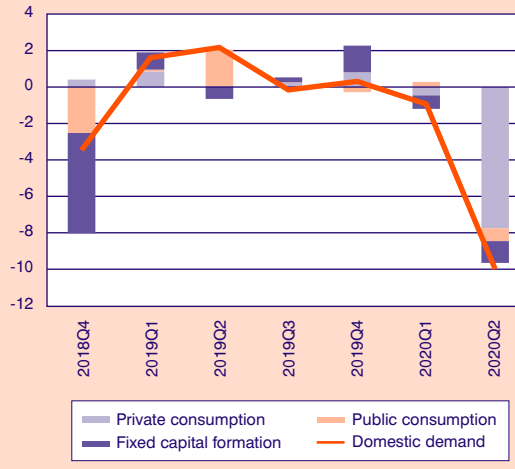


Source: ELSTAT, data processing by the author.

1. *Quarterly National* Accounts, Press release, ELSTAT, September 3, 2020.

quarter of 2020, plunged to -5% in the second quarter of 2020, indicating a reversal in the trade balance in favor of imports.

FIGURE 1.1.5
Contribution to the GDP growth rate: Components of domestic demand

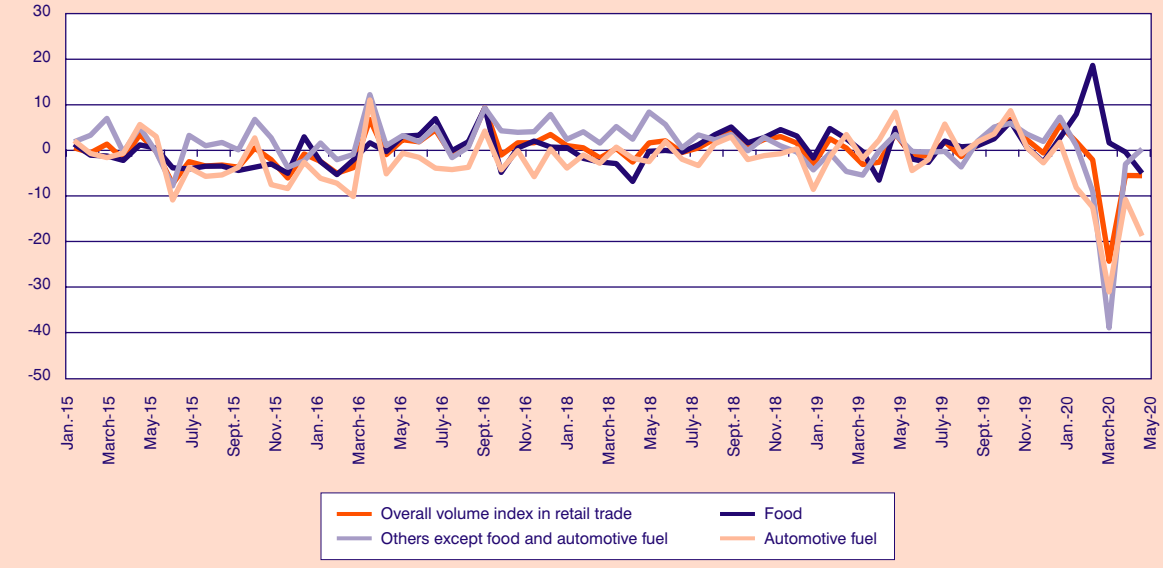


Source: National Accounts, ELSTAT, data processing by the author.

Retail trade fell sharply because of Covid-19, except for food items

Figure 1.1.6 depicts the evolution of retail trade according to the monthly data provided by ELSTAT. Observing the data, it appears that two periods stand out. The interval between the fourth quarter of 2019 and February 2020 marks a period wherein the pandemic makes its appearance and starts to spread throughout the country; however, there is no lockdown yet. The second period, from March up to the end of the second quarter of 2020 is characterized by the effects of the general lockdown imposed by the government. Indeed, during the first period, almost all percentage changes (with respect to the same month of the preceding year) were positive, with the exception of December 2019 (this does not hold for the category *other items except food and automotive fuel*), whilst in February 2020, only *automotive fuel* manifested a negative change. The situation changes fundamentally during the second period. The overall volume index, *other items* and *automotive fuel* exhibit negative percentage changes. At the same time, only the category of *other items* seems to recover slightly at a rate of 0.30% in June 2020. On the contrary, food items trade rose impressively in March 2020 (increase of 18.64%), whilst they presented negative changes only in May and June of 2020 (-0.37 and -5.02, re-

FIGURE 1.1.6
Percentage changes in the seasonally adjusted overall volume index and the main sector indices in retail trade



Source: ELSTAT, data processing by the author.

spectively). In general, the prevailing trend during the first two quarters of 2020 was negative as far as the overall volume index is concerned, since in terms of percentage changes, it decreased with an average value of -5.02%. To the contrary, as was probably expected, we observe a positive trend for the food index (mean value 4.26%), whilst the negative trend prevails in the categories of *other items* (mean value -7.06%) and *automotive fuel* (mean value -13.25%). Consequently, the developments in retail trade during the first semester of 2020, with respect to the corresponding semester of 2019, were clearly negative, with the food items sector being the exception.

Expectations in retail trade tumbled due to the pandemic and remain sluggish

Inspecting the confidence indicators published by EUROSTAT (Figure 1.1.7), we corroborate the general feeling of muted expectations due to the pandemic for March, April and May of 2020. In fact, this falling trend canceled out the preceding improvement of these indicators as of September 2019. Despite a short-lived reversal during June 2020, both indices returned to their negative trend in July and August confirming the unfavorable mood due to Covid-19.

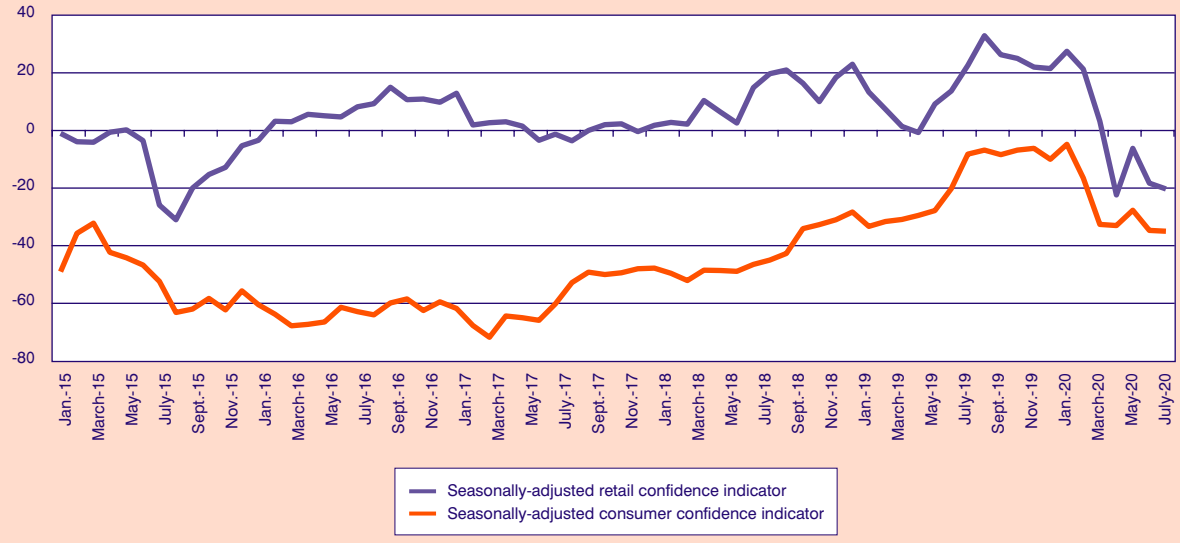
1.1.2.2. Investment

Investment fluctuated, except in the construction sector, which showed signs of recovery

Gross fixed capital formation decreased to 4,872 million euros in current prices during the second quarter of 2020, from 5,023 million euros in the first quarter and 5,345 million euros in the fourth quarter of 2019. Correspondingly, in terms of chain-linked volumes, the above decline is confirmed. The related figures are 5,687 million euros in the fourth quarter of 2019; 5,209 million euros in the first quarter of 2020; and 5,106 million euros in the second quarter. In terms of percentage changes with respect to the previous quarter according to the seasonally adjusted chain-linked volumes, the relevant figures are -8.4% in the first quarter and -2% in the second. Similarly, percentage changes in relation to the corresponding quarter of the previous year (2019) were -6.4% and -10.3%, respectively (Table 1.1.1).

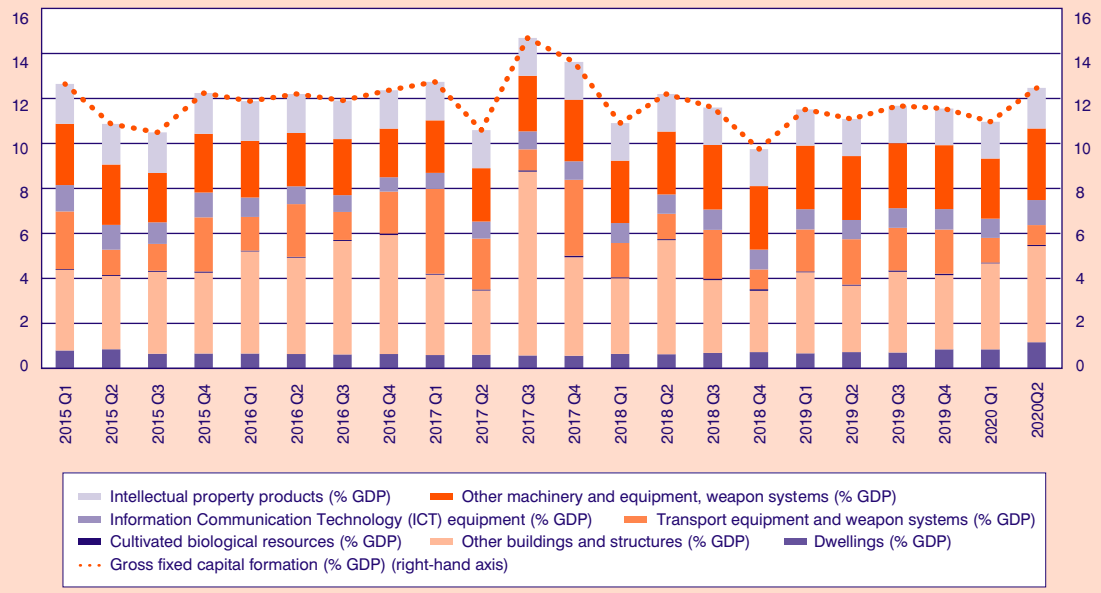
Of particular interest is the evolution of gross investment and its components as percentages of GDP (Figure 1.1.8). Both gross fixed capital formation and most of its components decrease as percentages of GDP during the first quarter of 2020, but they in-

FIGURE 1.1.7
Confidence indicators in retail trade



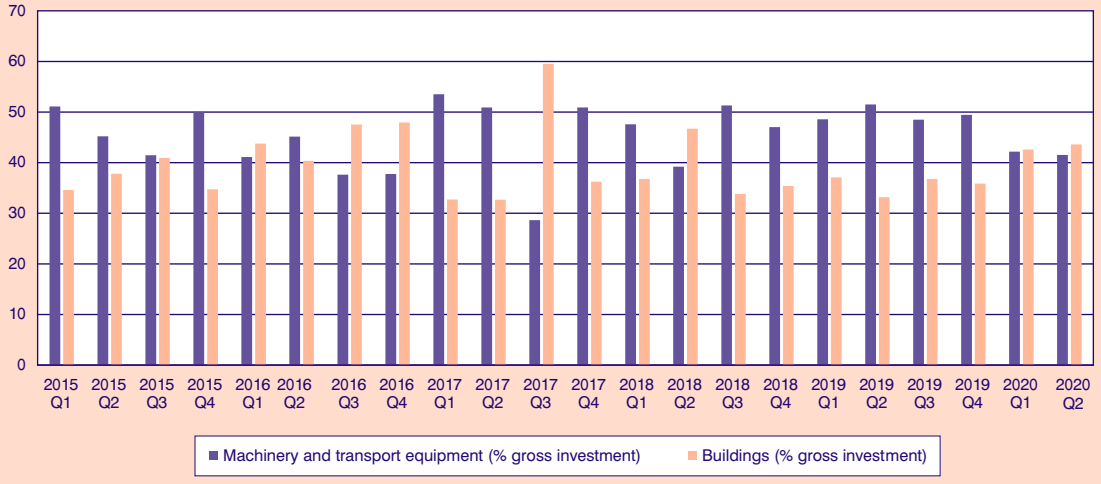
Source: EUROSTAT, data processing by the author.

FIGURE 1.1.8
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.

FIGURE 1.1.9
Machinery, transport equipment and buildings as percentages of gross fixed capital formation



Source: ELSTAT, data processing by the author.

crease in the second quarter of the same year. This is the trend that prevails in machinery and transport equipment, whilst buildings exhibit a positive trend during the first semester of 2020. In terms of percentage changes with respect to the previous quarter, we observe positive figures for buildings (12.71% and 16.43% in the first two quarters of 2020) but fluctuations in machinery and transport equipment where a negative value of -19.03% was followed by a rise of 11.97% in the corresponding quarters.

Buildings prevailed over machinery and transport equipment

Focusing on the two major components of gross investment, the share of buildings to the total gross investment rose steadily, from 35.86% in the fourth quarter of 2019 to 42.59% in the first and 43.60% in the second quarter of 2020. Conversely, the share of machinery and transport equipment fell from 49.44% to 42.19% and 41.53% in the corresponding quarters (Figure 1.1.9 above). Hence, the primacy of machinery and transport equipment versus buildings as of the third quarter of 2018 reversed in the first semester of 2020.

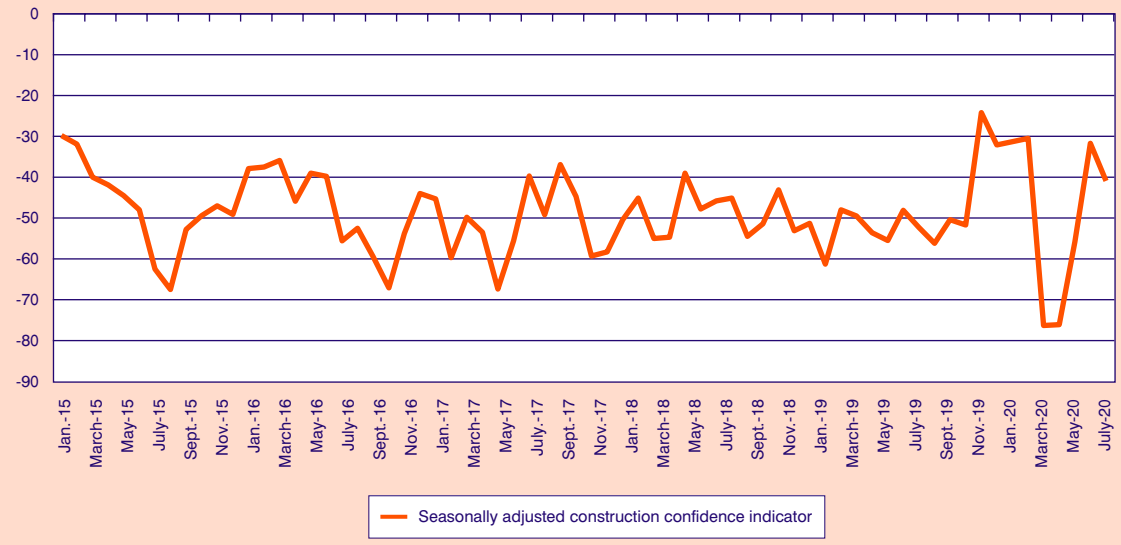
Expectations in the construction sector were weakly affected by the pandemic

The evolution of business expectations in the construction sector is depicted in Figure 1.1.10. The confidence index fell significantly in April 2020 (from -30.5 in March to -76.3 in April), which was maintained during the next month (-76.1 in May), but thereafter rose for two consecutive months before it turned down again in August 2020. Despite the wild fluctuation of the index during the lockdown months, April and May, its subsequent rise indicates a less severe impact of the pandemic on expectations in this part of investment demand. This was also confirmed by the evolution of the "buildings" component in gross fixed capital formation as explained in the previous section.

1.1.2.3. Conclusions

The above analysis indicates that the Greek economy passed through the first wave of the Covid-19 pandemic (first semester of 2020) with the various components of demand suffering the relevant economic consequences rather asymmetrically. Private consumption, whose importance in sustaining aggregate demand is crucial, was negatively affected. However, a closer look at the retail trade data showed that the food items sector was less severely affected by the health crisis despite the abrupt fall of confidence indices in retail trade. Gross investment fluctuated without any clear-cut trend, although inspection of its components indicated that the construction sector recovered rather quickly both in real magnitudes and in terms of expectations. Nevertheless, the reversal in the composition of gross investment at the expense of machinery and transport equipment and in favor of buildings, might have short-term benefits for the economy as a hedge against the effects of the pandemic, but it does not provide an answer to the long-term question concerning the change in the Greek model of economic development. Finally, it seems that our conclusion in the previous issue of the *Greek Economic Outlook* (issue 42) has been confirmed since the rise in public consumption as a percentage of GDP has been maintained and accelerated, being a significant factor in supporting demand in the era of the Covid-19 pandemic.

FIGURE 1.1.10
Construction confidence indicator



Source: EUROSTAT, data processing by the author.

KEPE, *Greek Economic Outlook,* issue 43, 2020, pp. 15-18

1.2. Intense deflationary trends after the outbreak of the COVID-19 pandemic

Emilia Marsellou

Greece

In August, businesses reopened in most economic sectors, except for some special categories of sectors that are directly affected by developments in tourism (such as canteens and hotels). Despite the gradual lifting of temporary travel restrictions and the reopening of shops, the COVID-19 pandemic still impacts consumer spending and, consequently, the corresponding sectors. *Energy* prices keep falling at high rates and except for the *Food-Beverage*, *Clothing and Footwear* and *Alcoholic goods and tobacco* sectors, which registered annual price increases, the rest of the sectors recorded larger or smaller reductions.

According to the latest ELSTAT data, the National Consumer Price Index (CPI) in August 2020 recorded an annual decrease of -1.9%, compared to a decrease of -1.8% and -1.6% in July and June, respectively (Table 1.2.1.). The core[1] CPI in August 2020 decreased by -1.4%. Correspondingly, the harmonized CPI (HICP) decreased by -2.3% and the core HICP by -2.4%.

More specifically, the annual decrease of the General CPI in August 2020 by -1.9% is a combined result of the

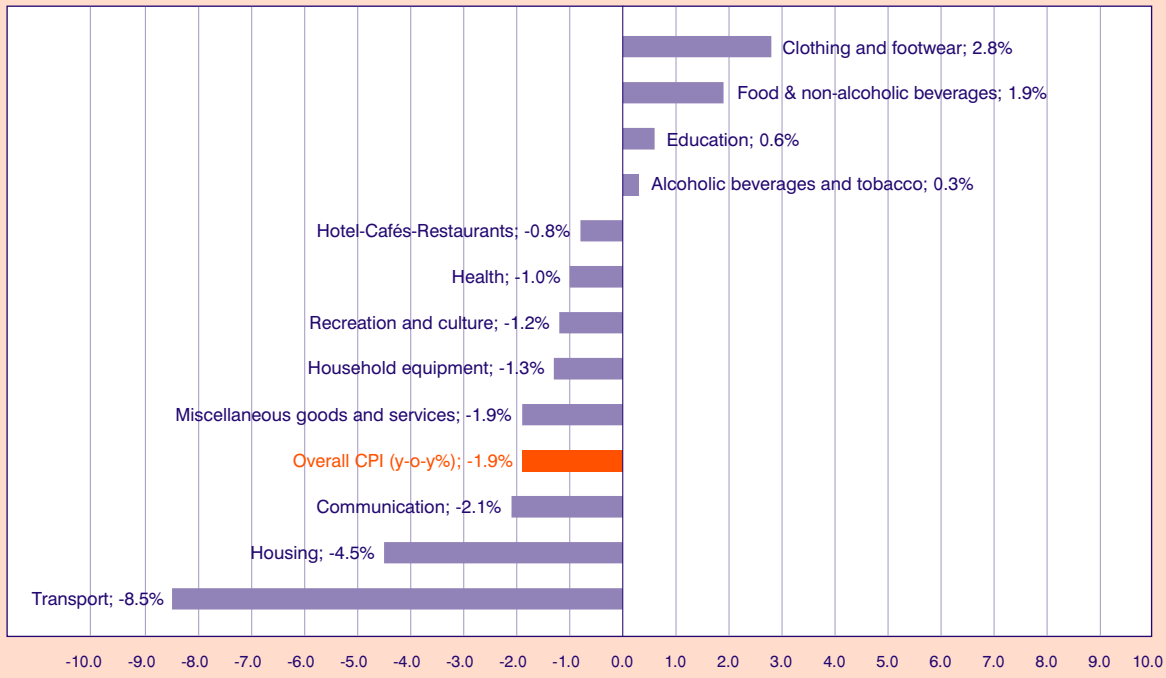
TABLE 1.2.1 Inflation in Greece (August 2020)

	Headline inflation (Greece)	Core inflation (Greece)	Harmonized inflation (Greece)	Core Harmonized inflation (Greece)
2019:M7	0.0	1.0	0.4	1.3
2019:M8	-0.2	0.7	0.1	0.9
2019:M9	-0.1	0.7	0.2	1.0
2019:M10	-0.7	0.4	-0.3	0.6
2019:M11	0.2	1.0	0.5	1.2
2019:M12	0.8	0.7	1.1	1.2
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

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 (August 2020)



Source: ELSTAT.

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

- **-8.5% in Transport.** This decrease is mainly attributed to the fall in the prices of *Fuels and lubricants* (-11.9%)[2] and *Transport services* (-11.6%), particularly, in *Passenger transport by air* (-25.8%). This decrease was partly offset by increases in the prices of *New motorcars* (1.5%).
- **-4.5% in the Housing sector.** This decrease is mainly due to the significant fall in the prices of *Heating oil* (-30.6%) and *Natural gas* (-34.7%) and was partly offset by the increase, mainly, in the prices of *Electricity* (4.5%).
- **-1.9% in Miscellaneous goods and services.** This decrease is mainly attributed to the fall in the prices of *Other appliances and articles for personal care* (-4.8%) and *Other personal effects n.e.c.* (-4.1%), and is partly offset by the increase, mainly, in the prices of *Motor vehicle insurance* (0.6%) and *Social Protection* (1.1%).
- **-2.1% in Communication,** due to the decrease, mainly, in the prices of *Telephone services* (-2.4%) and *Mobile telephone equipment* (-8.0%). This decrease is partly offset by the increase, mainly, in the prices of *Postal services* (35.1%).
- **-0.8% in Hotel-Cafés-Restaurants.** This decrease, which is mainly due to the fall in the prices of *Hotels, motels, inns and similar accommodation services* (-15.2%), is partly offset by the increase, mainly, in the prices of *Restaurants-confectioneries-cafés-buffets* (0.2%).
- **-1.0% in Health,** which is mainly attributed to the fall in the prices of *Pharmaceutical products* (-3.3%).
- **-1.3% in Household equipment.** This is mainly due to the decrease in the prices of *Household textiles* (-4.1%), *Household appliances and repair* (-4.2%) and *Non-durable household goods* (-1.0%).
- **-1.2% in Recreation and culture.** This decrease is mainly attributed to the fall in the prices of *Audiovisual and information processing equipment* (-4.5%)

2. In more detail: Diesel -16.3%, Gasoline -11.9%, Other fuels -8.7% and Lubricants -1.3%.

TABLE 1.2.2 Annual changes in CPI sub-categories, January-August 2020

Groups of goods and services	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.
1 Food and non-alcoholic beverages	-0.1	-0.1	-0.1	1.0	1.5	3.6	1.8	1.9
2 Alcoholic goods and tobacco	0.4	-0.3	0.3	0.0	0.2	0.4	0.1	0.3
3 Clothing and footwear	-1.1	-0.2	12.2	0.3	3.4	-1.9	4.1	2.8
4 Housing	0.2	-1.2	-2.9	-4.7	-3.9	-4.5	-4.5	-4.5
5 Household equipment	-0.5	-0.7	-1.3	-1.6	-0.8	-1.2	-0.9	-1.3
6 Health	1.6	1.5	1.5	1.4	1.4	1.5	-0.6	-1.0
7 Transport	5.2	3.4	-1.5	-6.1	-7.0	-9.1	-9.1	-8.5
8 Communication	0.9	-0.7	-1.8	-2.3	-2.2	-2.4	-1.8	-2.1
9 Recreation and culture	-1.1	-1.2	-1.4	-1.3	-0.9	-1.2	-1.1	-1.2
10 Education	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6
11 Hotel-Cafés-Restaurants	1.0	0.6	0.6	0.5	0.2	-0.6	-0.6	-0.8
12 Miscellaneous goods and services	-0.3	-1.2	-1.0	-0.8	-0.8	-1.0	-0.8	-1.9
General Index	**0.9**	**0.2**	**0.0**	**-1.4**	**-1.1**	**-1.6**	**-1.8**	**-1.9**

Source: ELSTAT.

and *Other recreational items and equipment, gardens and pets* (-1.2%).

On the other hand, prices increased in the following groups of goods and services:

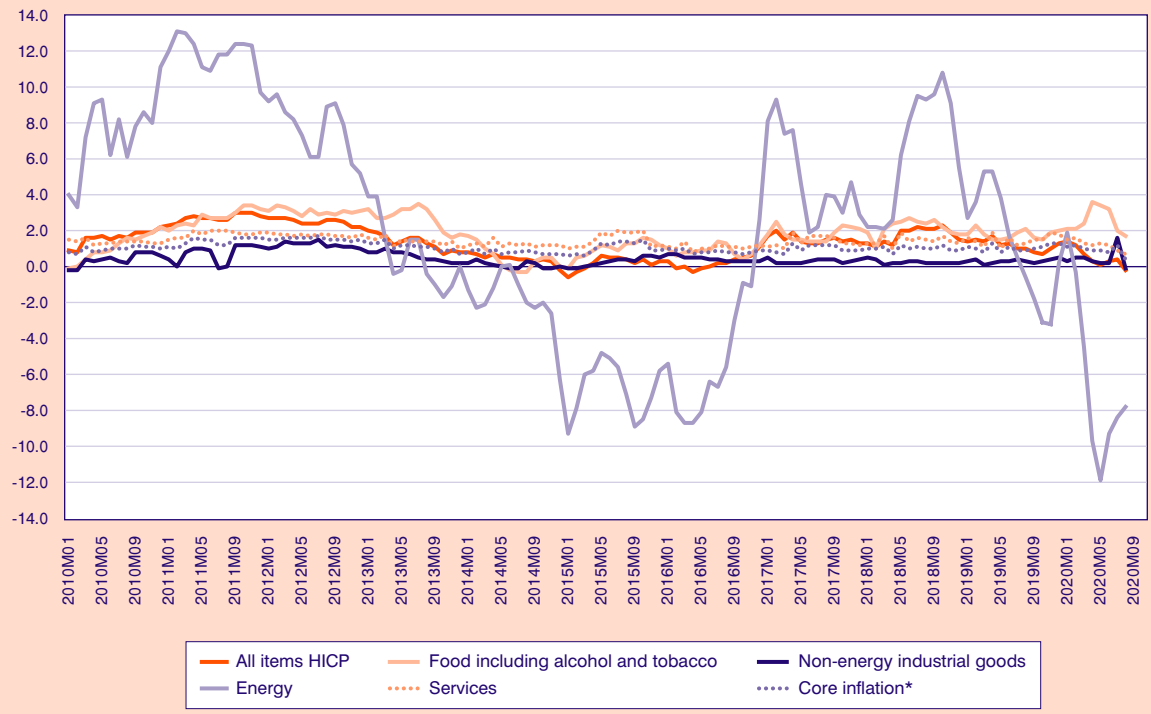
- **1.9% in Food and non-alcoholic beverages.** This is mainly due to the increase in the prices of: *bread and cereals, beef, pork, lamb and goat, dried salted or smoked meat, milk cheese and eggs, fresh fruits, preserved or processed vegetables.* This increase was partly offset by the decrease, mainly, in the prices of: *poultry, fresh fish, olive oil, fresh vegetables, potatoes, soft drinks.*
- **2.8% in Clothing and footwear.** This increase is mainly attributed to the increase in the prices of *Clothing and footwear.*
- **0.3% in Alcoholic goods and tobacco**. This increase is mainly attributed in the rise of the prices of *Alcoholic beverages* (0.9%)
- **0.6% in Education.** This increase is mainly due to the rise in the prices of fees of *Pre-primary and primary education* (2.2%).

The Euro area

According to Eurostat's estimates, annual inflation in the euro area in August 2020 was -0.2%, down from 0.4% and 0.3% in July and June 2020, respectively. This is the first time since the outbreak of the COVID-19 pandemic that the euro area has recorded consumer price deflation. This development reflects the progressive re-emergence of the travel and transport restrictions for the mitigation of the spread of COVID-19 in several member states of the euro area, following the relative relaxation of measures during the summer holidays. As regards individual euro area member states, Slovakia (1.4%), Austria (1.4%) and Lithuania (1.2%) recorded the highest inflation in August, while Cyprus (-2.9%) and Greece (-2.3) registered the highest deflationary pressure.

Key inflationary factors in the euro area in August 2020, were *Food, alcohol and tobacco* (1.7%), showing a gradual de-escalation compared to the last four months (April 3.6%, May 3.4%, June 3.2%, July 2.0%). The following sector is *Services* with an annual increase of 0.7%, while the prices of *Non-energy industrial goods*

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



Source: Eurostat.

* Overall index excluding energy, food, alcohol and tobacco.

recorded a negative sign (-0.1%) for the first time since the beginning of the pandemic. *Energy* prices continue to record the largest decline (-7.8%), but it is decelerating (June -9.3%; July -8.4% compared to May -11.9%). Finally, core inflation in the euro area reached 0.4%, down from July (1.2%) and June (0.8%).

KEPE, *Greek Economic Outlook,* issue 43, 2020, 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 2020,[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 126 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 June 2020. In addition, this section emphasizes the altered conjuncture due to the COVID-19 pandemic. It is noted that, on the one hand, the projections incorporate data up to the second quarter of 2020 relating to a prolonged period characterised by the implementation of emergency measures restricting and suspending economic and social activity in the country due to the pandemic. On the other hand, the immense shock caused by the pandemic, alongside the arising uncertainty, which remains unprecedented even in the current juncture, generally complicate the forecasting of the evolution of major macroeconomic aggregates in 2020. Moreover, the difficulty in projecting economic developments at present lies in the fact that, first, the full range of the particularly adverse effects of the induced disturbance remains unclear and is not entirely reflected in the statistical data up to June 2020, which are incorporated in the model. Second, any accurate quantification of the effects of the compensatory measures implemented to deal with the pandemic and shield the economy remains complex. The related effects are expected to gradually pass through to economic aggregates in the short to medium term.[4]

Based on the factor model econometric estimates presented in Table 1.3.1, the mean annual rate of change of real GDP for 2020 is predicted at -7.8% and the mean rate of change for the second half of 2020 at -7.7%. These forecasts signal the deterioration of economic conditions in the country, due to the shock caused by the COVID-19 pandemic. It is noted that the estimated mean annual rate of change incorporates published (provisional) GDP data for the first and second quarters of 2020,[5] according to which the Greek GDP contracted by -15.2% (in terms of chain-linked volumes), compared to the respective quarter of 2019. The referred data suggests that 2020 will be a recessionary year, as confirmed by the above-presented estimates. The projected recessionary conditions are further mirrored in the negative rates of change for the third and fourth quarters of 2020 (compared to the respective quarters of 2019), forecasted at -6.9% and -8.4%, respectively.

1. The date of the forecast is September 21, 2020.

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*. 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 (second quarter of 2020). 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 employed factor model, while they stress more than ever the necessity to enhance the analytical framework through nowcasting and impact assessment procedures.

5. According to the most recent ELSTAT *Quarterly National Accounts* publication, dated September 3, 2020.

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

	2020	
Quarters	**2020Q3**	**2020Q4**
Quarterly rate of change	-6.94 [-6.62, -7.26]	-8.41 [-7.77, -9.04]
Second half mean rate of change	-7.67 [-7.19, -8.15]	
Mean annual rate of change	-7.76* [-7.52, -8.00]	

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

* The mean annual rate of change incorporates the officially available (provisional) data for the first and second quarters of 2020, on a seasonally adjusted basis.

The above-presented overall assessment of the expected economic conditions in the country for 2020 is in line with the recent course of the major GDP components and a large number of economic variables and indicators, as implied by the corresponding observations for the second quarter of 2020 (compared to the respective quarter of 2019), on a non-seasonally and non-calendar adjusted basis. In more detail, all the major GDP components (private consumption, investment, exports and imports of goods and services) recorded a considerable decline by double-digit negative rates of change, with the most adverse development relating to exports of services. Unfavourable developments characterised the industrial production index, as well as the turnover index in industry (overall, internal and external markets), in terms of both the general indices and the sub-indices (with the exception of the *non-durable consumption goods* category of the external market turnover index in industry). The recorded negative and almost without exception double-digit percentage changes were most adverse for the *durable consumption goods* category in the case of the industrial production index and the *energy* and *durable consumption goods* categories in the case of the turnover index in industry. The volume index in retail trade also registered a significant decrease in terms of the general index and the sub-indices, except for the *supermarkets* category. Among the recorded double-digit negative rates of change, the most noticeable one refers to the sub-index for the *clothing-footwear* category. The most adverse development in terms of the observed negative percentage changes concerns travel receipts, which fell by -98.2% in the second quarter of 2020, compared to the respective quarter of 2019, while transport receipts also declined significantly. Negative developments further characterised the Stock Exchange, the private passenger cars market (on the basis of licenses issued and the turnover index for motor trade) and the turnover in wholesale trade. The construction sector was also severely hit by the effects of the pandemic and the related measures implemented, as indicated by the unfavourable course of the production indices in construction (general index and *production of building construction* and *production of civil engineering* sub-indices), as well as the fact that private building activity in terms of volume and on the basis of permits issued remained almost unchanged. Finally, as expected, the major shock that hit (and continues to disturb) the Greek economy significantly affected expectations and assessments formed by economic agents with regard to the course of economic activity (concerning manufacturing, exports and developments in individual sectors of the economy) which sharply deteriorated. In parallel, the Economic Sentiment Indicator for Greece fell considerably, while the decrease in the corresponding index for all the EU countries was even larger.

Among the few limited positive developments in the second quarter of 2020 is the moderate improvement in terms of a number of the underlying competitiveness indicators, as well as the further decline in spreads, compared to the respective quarter of 2019. Still, note that the spreads increased for the second consecutive time on a q-o-q basis.

Great importance is attributed to developments in the domestic labour market, where, for the first time after a prolonged period characterised by increasing trends, total employment (as well as the number of the employed in the secondary and tertiary sectors) declined in the second quarter of 2020. In contrast, statistical

data for unemployment on an aggregate level, as well as for the long-term and the newly unemployed, do not yet indicate any negative developments during the second quarter of 2020, as compared to the respective quarter of 2019. Nevertheless, with the unemployment rate at 16.7%, labour market conditions remain unfavourable and are significantly affected by measures implemented to protect public health and tackle the pandemic.[6]

The projected course of real GDP in 2020 and, hence, the overall economic conditions in Greece are accompanied by a particularly high degree of uncertainty, linked to the inability to predict the spread, the severity and the duration of the pandemic during the upcoming months, on domestic and international levels. Greece remains vulnerable to the ensuing disturbance, mainly due to its dependence on external demand and the high share of economic activity in sectors that have been more severely hit by the repercussions of the pandemic. Among these are the tourism and transport sectors, where it is indicative that travel and transport receipts declined by -84.4% and 26.2%, respectively, in July 2020, as compared to July 2019.

More generally, any less or more favourable –than indicated by the above presented forecasts– developments in Greek GDP in 2020 are clearly intertwined with the impact of the pandemic on a wide range of factors and dimensions. Among these factors are demand and supply dynamics, Greece's export performance, investment and saving decisions by households and enterprises, developments in employment and unemployment and, hence, income, as well as financial conditions and fiscal aggregates. At the same time, these developments are subject to the compensatory effects of the economic measures already implemented and to be implemented in the near future on domestic and international levels. Finally, it should be stressed that in early 2020, and before the outbreak of the pandemic, the Greek economy exhibited considerable growth dynamics, while it positively progressed in terms of basic economic aggregates, the rebalancing of major fiscal aggregates and the implementation of crucial reforms. As a result, provided that the pandemic is effectively managed and the impact of the associated shock remains short-lived and subsides towards the end of the year, the Greek economy is expected to gradually recover and return to positive real GDP growth rates in 2021.

6. See also the corresponding notes included in the Press Release for the *Labour Force Survey* by ELSTAT, referring to the second quarter of 2020 and dated September 17, 2020, where it is stressed that the implemented measures also affected the data collection method of the survey.

KEPE, *Greek Economic Outlook,* issue 43, 2020, pp. 22-24

1.4. The (non) feasible role of investments in the post-COVID-19 Greek economy

Nikolaos Rodousakis, George Soklis

1.4.1. Introduction

The development of the Greek economy in the post-COVID-19 era will strongly depend on the decisions that will be taken in the next period for the distribution of available national and European Union resources in investment programs. In this article, we contribute to the relevant discussion by providing estimates of the multiplier effects of investments in the Gross Domestic Product (GDP), employment and imports of Greek economy, derived from empirical measurements made on the basis of a multi-sector model, with joint-products and heterogeneous labour, which is based on the concept of the Sraffian multiplier.[1] For the mapping of intersectoral relations, we used data from the Supply and Use Tables (SUTs) of the Greek economy for the year 2015, taking into account the composition of investment spending in the economy.

In Section 1.4.2, we present the empirical findings of our analysis, while in Section 1.4.3, we summarize the main findings.

1.4.2. Multiplier effects

For the assessment of the multiplier effects of investment in GDP, employment and imports of Greek economy, we consider as exogenously given the composition of gross fixed capital formation as reflected in the Use Table and we normalize sizes so that the estimates correspond to multiplier effects of monetary unit changes of investment, wherein the monetary unit is set to €1 million (for more details, see Mariolis et al., 2018, Appendix 1).

The findings of our analysis indicate that a change, let's say an increase, in investment expenditure by €1 million would lead to a total (direct and indirect)

a) decrease in GDP of about € 0.682 million, whose distribution *per commodity* is depicted in Table 1.4.1;

b) decrease in the levels of total employment of about 18,930 full-time workers, whose *sectoral* distribution is depicted in Table 1.4.2 and a

c) decrease in total imports of about €0.608 million, whose distribution *per commodity* is depicted in Table 1.4.3.

TABLE 1.4.1 The distribution (%) of changes in GDP per commodity

Commodity	Distribution of changes
Constructions	59.8%
Research and development services	13.6%
Computer programming services and other related information services	7.6%
Real estate management	6.0%
Machinery and equipment n.e.c.	6.0%
Food	4.4%
Other goods	2.6%

Source: Authors' estimates.

1. The concept of the Sraffian multiplier is based on Kurz (1985); Metcalfe and Steedman (1981); and Mariolis (2008). For empirical applications, see, e.g., Mariolis and Soklis (2018) and Mariolis et al. (2018, 2020a).

TABLE 1.4.2 The distribution (%) of changes in employment per sector

Sector	Distribution of changes
Constructions	44.5%
Agriculture	6.2%
Manufacture of metal products	4.8%
Computer programming services and other related information services	4.1%
Activities of architects and engineers	4.0%
Legal and accounting activities	4.0%
Other industries	32.4%

Source: Authors' estimates.

TABLE 1.4.3 The distribution (%) of changes in imports per commodity

Commodity	Distribution of changes
Computers, electronic and optical products	19.8%
Other transport equipment	19.8%
Machinery and equipment n.e.c.	13.6%
Motor vehicles, trailers and semi-trailers	5.5%
Minerals	5.4%
Furniture and other processing products	4.6%
Other goods	31.3%

Source: Authors' estimates.

Taking into account the GDP of the Greek economy for the year 2019, the level of employment, and the imports of goods and services, we estimate that a decrease in investments by 1 billion euros would lead to a total (direct and indirect)

a) increase in GDP of about 0.36%;

b) increase in employment of about 0.44%, and an

c) increase in imports of about 0.87%.

It follows from the above findings that the multiplier effects of investments in the Greek economy are very weak. Indicatively, we mention that the average GDP multiplier of the Greek economy is of about 0.99, the average employment multiplier is of about 26.3, and the average import multiplier is of about 0.46. That is, the investment expenditure has unfavorable multiplier indicators in comparison to the average of the Greek economy, both in terms of GDP and employment as well as in terms of imports. The further analysis of the findings indicates that the adverse multiplier effects of investment expenditure are due to the great dependence of the Greek economy on imported inputs and, in particular, on imports of industrial products, which are the predominant investment products of an economic system.[2]

2. In detail, see Mariolis et al. 2020b.

1.4.3. Conclusions

The analysis of the multiplier effects of the investments of the Greek economy shows that a change, let's say an increase, of the investment expenditure by €1 billion causes a *ceteris paribus* GDP increase of 0.36%, an increase of employment by 0.44% and an increase of imports by 0.87%. Given the current composition of the investment cost in the Greek economy, it follows that a vertical increase in investment in the Greek economy will mainly benefit the construction sector. Furthermore, the above multiplier effects can be considered as particularly unfavorable compared to the average multipliers of the Greek economy, mainly due to the high dependence of the Greek economy on imported industrial products. The composition of the multiplier effects of investment expenditure on imports indicates that, in order to improve the multiplier effects of investment, a long-term plan is needed to create investment incentives for the development of the domestic production of computers, electrical and optical products, as well as transport equipment, machinery and other equipment in order to replace as much as possible the imports of the above products. All the above lead to the conclusion that the instrumental role of investments in the case of the Greek economy is not, as it is emphasized, to contribute to GDP growth in the short term, but in the long term, through the appropriate intersectoral planning to contribute to the creation of a production model capable of global challenges, while aiming at equitable income distribution and sustainability.

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1.5. Developments, policies and challenges in the labour market during the pandemic

Ioannis Cholezas

1.5.1. Introduction

The situation in the labour market has worsened, due to the social distancing measures implemented in order to prevent the spread of Covid-19, deviating from its previous course characterised by increasing employment and decreasing unemployment. The decline in employment in the first six months of 2020 is asymmetrical with respect to population groups, industries and occupations.

The government intervened quickly and managed to avoid massive job losses by supporting firms and employment. However, the insufficient demand for goods and services produced locally, especially from abroad, which typically boosts labour supply and increases employment in the second quarter of the year, like tourism (including accommodation and food services), did not leave any room for positive developments.[1]

It is difficult to make a prediction about the future of the labour market with so much uncertainty involved. Among others things, developments in the labour market will depend on the intensity of the second wave of the pandemic, which has already started in several European countries. It will also depend on governments' actions, especially those of our main trade partners, the interventions of the Greek government, how soon a vaccine will be available, as well as how soon the situation will be smoothed given that changes in consumer behaviour triggered by the pandemic may last longer than expected. Last but not least, the size of the economic damage caused by the time a vaccine becomes available will also be of great importance. For instance, how many firms will be forced to shut down or how many people will lose their job or a vital share of their income in the process, despite state interventions throughout EU member-states.

1.5.2. Employment

The number of employed individuals decreased in the first six months of 2020 (January-June) on a year-on-year basis[2] following the reduction of the economic activity due to Covid-19. The reduction was felt during the second quarter of the year, since in the first quarter, the number of the employed did increase. However, that increase was smaller than the respective annual increase between 2018 and 2019 (2.5 times bigger last year: 96 thousand vs. 38.6 thousand in 2020Q1). In the second quarter, characterised by restrictions in international transports and the blow to tourism all over the world, the reduction in employment was expected, despite government interventions which focused primarily on those already employed. In the second quarter of 2020, there were 112.4 thousand fewer employed individuals compared to 2019Q2 (see Graph 1.5.1). Although the total number of the employed decreased by 2.9% on an annual basis (2019Q2-2020Q2), the reduction affected men more: 73.1 thousand (or 3.3%) fewer employed men vs. 39.3 thousand (or 2.4%) fewer employed women. Moreover, employed youth, aged 20-24, exhibited the greatest proportional reduction, but the greatest number of jobs was lost in the group aged 30-44 (92.7 thousand). The only age group that has seen the number of its employed members increased since the second quarter of 2019 is the group 45+.

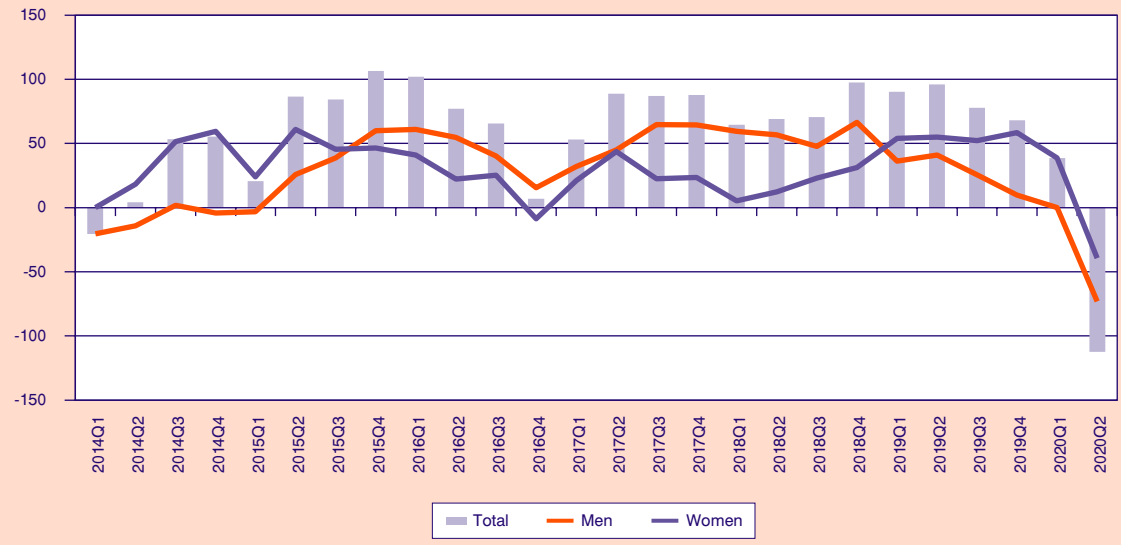
The number of the full-time employed decreased faster than the part-time employed over the past year. Additionally, the reduction of working hours was one of the available options given to firms to secure jobs. In the second quarter of 2020, there were 2.9% fewer full-time employed individuals, i.e., 105.7 thousand fewer, compared to 2019Q2 and only 1.9% fewer part-time employed, i.e., 6.8 thousand fewer. Part-time employment as a share of total employment increased to 9.2% (8.5% in 2019Q2), while the number of the underemployed[3] as a share of the part-time employed decreased by almost five percentage points (to 61.1%).

1. Note that the value of exports in July 2020 compared to July 2019 declined by 10.1%, where it increased by 8.4% during the same period between 2018 and 2019.

2. The term year-on-year (y-o-y) refers to a comparison of the results at one period, e.g., month, quarter, etc., with those of a comparable period on an annualised basis.

3. Based on the definition by ELSTAT, those who work part-time but would prefer to work full-time and are available to start a full-time job immediately are underemployed.

GRAPH 1.5.1
Year-on-year change in the number of the employed (in thousand persons)



Source: Labour Force Survey, ELSTAT, KEPE processing.

The total annual reduction of 112.4 thousand employed persons came primarily from *Accommodation and food services,* where the reduction reached 82.3 thousand (Graph 1.5.2). Since 2019Q2, approximately 20% of the jobs in the industry were lost, four times the number of hires in period 2018Q2-2019Q2. An additional 30 thousand jobs were lost in *Agriculture, fishery and forestry* and another 14 thousand were lost in *Construction*. It is interesting that 85 thousand paid employment jobs were lost in *Accommodation and food services* while 6.6 thousand self-employed jobs with no personnel were created. Maybe some kind of substitution took place between the two types of employment. On the contrary, in *Agriculture, forestry and fishing* most job losses involved the self-employed with no personnel.[4] On the other hand, the number of the employed in *Wholesale and retail trade etc.* increased by 18.7 thousand, followed by the increase in the number of the employed in *Human health and social security services* by 15.7 thousand. In both industries, the majority of new hires involved paid employment.

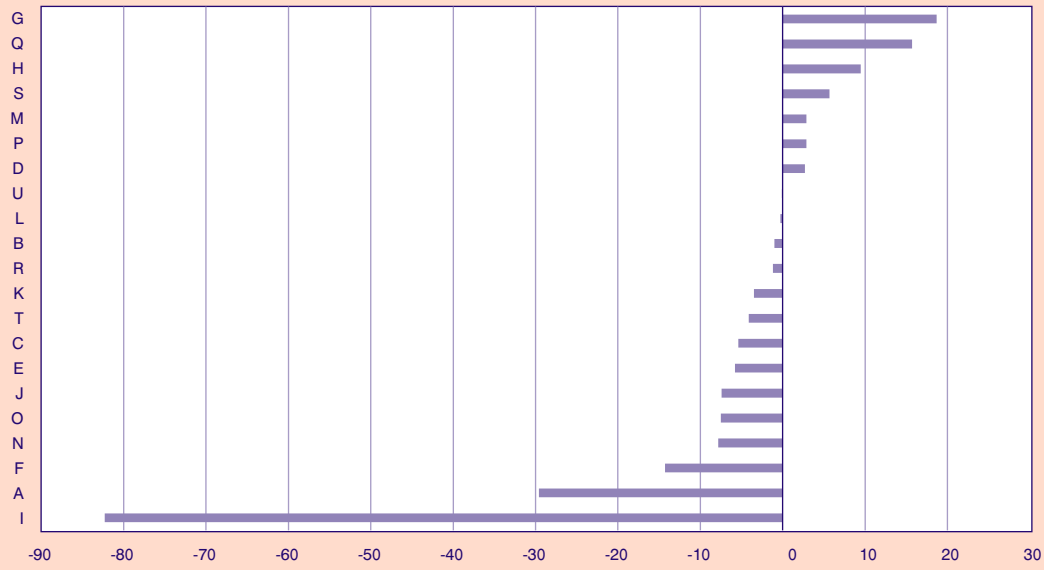
The greatest reduction in the number of jobs was recorded in *Service workers and shop and market sales workers* where 35.2 thousand jobs were lost (Graph 1.5.3). The second greatest reduction was in *Craft and related trades workers* (32.9 thousand); this group exhibited the biggest proportional decrease (9%). Significant job losses were also recorded in *Skilled agricultural and fishery workers* (28.2 thousand) and *Elementary occupations* (26.8 thousand). On the contrary, the number of employed *Professionals* increased by 10 thousand, while *Legislators, senior officials and managers* increased by 9 thousand; this is the biggest proportional increase, by 7.9%. Regarding the position of the employed, the biggest reduction was recorded amongst paid employees (86 thousand) followed by the self-employed without personnel (15.2 thousand); the number of self-employed with personnel also decreased by 2.5%.

Despite the reduction in the number of the employed, the decrease in employment is reflected in several other parameters. For example, 22.3% of the employed were absent from work in the second quarter of 2020, when the respective share was 9.2% in 2020Q1 and less than 2% in 2019Q2 (see ELSTAT's Press Release on September 17, 2020[5]). Absence from work was more common in *Trade, Hotels and restaurants, Transport and communication* (30.3% said they were absent from work in 2020Q2 vs. 1% a year ago) and in *Construction* (26.2% stated they were absent from

4. In *Agriculture, forestry and fishing,* paid employment typically represents only a small share of employment.

5. The Press release is available at ELSTAT's website at <https://www.statistics.gr/el/statistics/-/publication/SJO01/2020-Q2>.

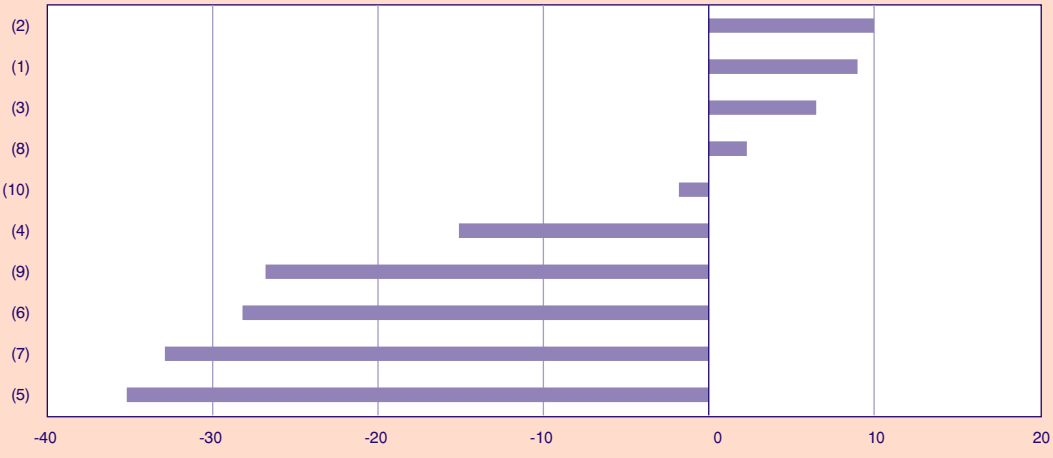
GRAPH 1.5.2
Annual change (2019Q2-2020Q2) of the employed by industry (in thousand persons)



Source: Labour Force Survey, ELSTAT, KEPE processing.

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

GRAPH 1.5.3
Annual change (2019Q2-2020Q2) of the employed by one digit occupation (in thousand persons)



Source: Labour Force Survey, ELSTAT, KEPE processing.

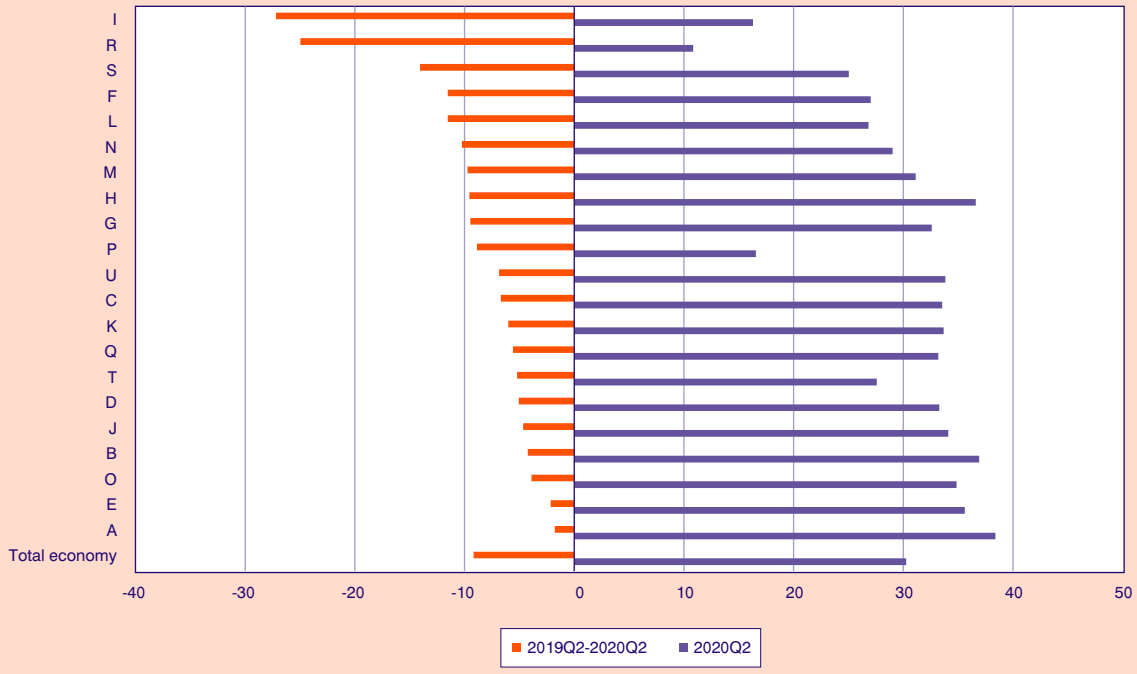
Note: 1. Legislators, senior officials and managers, 2. Professionals, 3. Technicians and associate professionals, 4. Clerks, 5. Service workers and shop and market sales workers, 6. Skilled agricultural and fishery workers, 7. Craft and related trades workers, 8. Plant and machine operators and assemblers, 9. Elementary occupations, 10. Armed forces.

work compared to 0.7% in 2019Q2). Moreover, due to social distancing, the share of the employed who had to work from home doubled compared to 2019Q2, reaching 10.7% in 2020Q2 throughout the economy. It seems that working from home was much easier and, hence, more common in *Financial and business activities* (21%), since the share increased by approximately ten percentage points compared to 2019Q2, and *Other services* in which the increase reached eleven percentage points and stood at 19.4%.

Another parameter that was affected by Covid-19 measures is weekly working hours. The average weekly working hours throughout the economy decreased compared to both the first quarter of the year and the second quarter of 2019 (Graph 1.5.4). *Accommodation and food service activities* and *Arts, entertainment and recreation* exhibited the biggest annual decreases (27.2 hours and 25 hours, respectively); the number of weekly working hours in the latter is smaller than eleven in the second quarter of 2020, the smallest number across all industries.

Considering the number of jobs lost already discussed, it becomes clear that *Accommodation and food service activities* was hit the hardest by the pandemic in terms of employment; it lost the biggest number of jobs and it saw weekly working hours drop faster than any other industry. The situation is similar in *Construction,* which exhibited the third biggest number of job losses and the fourth largest reduction in weekly working hours. On the contrary, *Agriculture, forestry and fishing* reported big losses in terms of jobs, but very few losses in terms of working hours. It is interesting that in *Human health and social work activities,* which saw the number of its employed increase, unsurprisingly due to the increase in the demand for its services, the number of weekly working hours declined. Arguably, most of the hires could involve specialties in high demand due to the pandemic; while declining

GRAPH 1.5.4
Usual weekly working hours and annual change



Source: Labour Force Survey, ELSTAT, KEPE processing.

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

weekly working hours could involve other specialties for which the demand declined due to the fear of infection (many people were afraid to go the hospital for illnesses other than the coronavirus).

To summarise, the impact of Covid-19 and the associated measures to contain its spread had an adverse effect on economic activity. Despite state measures to support businesses and employment, there are significant losses in terms of employment that differ in intensity across industries, while there are diverse effects also across gender and age. Losses are realised in terms of the number of the employed, the more frequent absence from work, the expansion of work from home and the reduction in the usual number of weekly working hours.

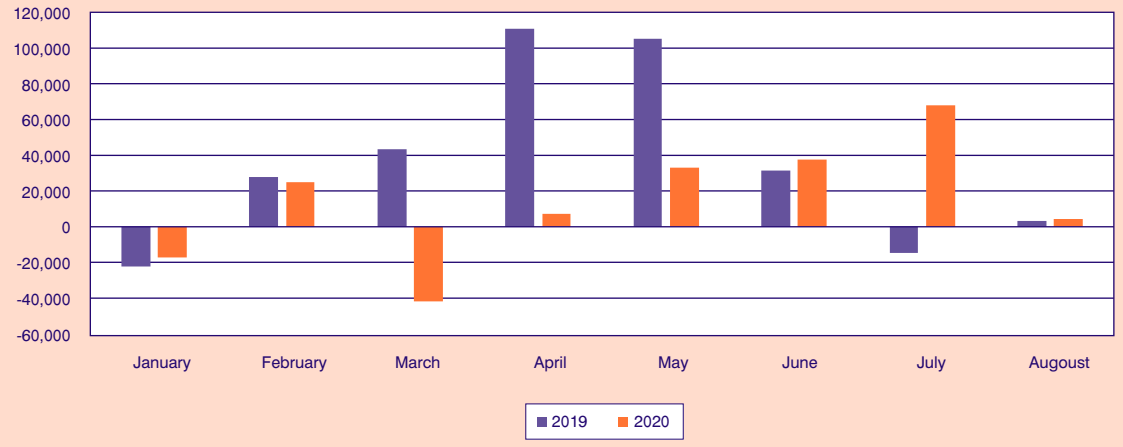
1.5.3. Paid employment - ERGANI

Social distancing, which was introduced in March 2020 and gradually started to weaken two months later, had a significant impact on businesses and paid employees. In particular, in the first two months of 2020, paid employment flows were similar to those in the first two months of 2019 (Graph 1.5.5). Since March, though, when social distancing measures were implemented, the differences between the two years has become evident, reflecting a rapid deterioration of flows. In April and May, paid employment flows fell severely behind expectations (103.7 thousand and 72.3 thousand fewer jobs) and compared to the same months in 2019. Despite improved performance in new jobs in June and July (6.1 thousand and 82.6 thousand more jobs compared to 2019) and a similar performance in August (1.2 thousand more jobs), the first eight months of 2020 are characterised by far fewer jobs compared to the respective period in 2019.

Specifically, in the first eight months of the year, the number of paid employees increased by 115,647 persons, which is significantly worse than the respective period in 2019, when the increase amounted to 284,886 persons. A careful observer would notice that between the two years, there is a big difference in hires. While in the first eight months of 2019 approximately 1,865,346 persons were hired, the respective number in 2020 was 1,317,792 persons. This means that in the first eight months of the year, 550 thousand fewer hires were realised, almost one-third fewer. On the contrary, there were fewer layoffs in 2020, by about 380 thousand. Given the adverse effects the pandemic had on economic activity, state interventions to protect businesses and employment, which were introduced swiftly and are still in effect, should probably be credited with the small number of layoffs.

Based on the most recent estimates prepared by the Labour Market Diagnosis System,[6] managed by EIEAD,[7] paid employment job losses (in terms of jobs

GRAPH 1.5.5
Net paid employment flows



Source: ERGANI reports, January-February 2020.

6. The data are available at <https://lmd.eiead.gr/covid-19-labor-market//>.

7. ΕΙΕΑΔ: National Institute for Labour and Human Resources.

that were not created as expected) surpassed 471 thousand in *Accommodation services* from April until July, due to the fact that some firms either did not open at all (mostly seasonal businesses) or operated but suffered from a significant drop in the demand for their products and services. Another 244 thousand jobs were not realised in *Food services* and 67 thousand additional hires were never realised in *Retail trade, except for cars and vehicles*. The biggest losses were recorded in June and July. Coupled with the information about the industries that were faced with the biggest job losses, it becomes clear that tourism contributed significantly to the disappointing situation in the labour market.

An interesting feature is that half, or even more, of the hires realised between January and August involved full-time jobs, especially in March, April and May (56%, 66.8% and 55.5%, respectively). The share of part-time job hires remained almost unchanged, while the share of work-in-shift job hires decreased. This is different to the case in previous years. Perhaps it has everything to do with the industries that made the hires. On the other hand, the number of full-time job contracts converted to flexible job contracts unsurprisingly increased in the first eight months of the year (January-August) following the state support measures for businesses and employment. The increase was particularly strong in March and April compared to the respective months in 2019, when conversions more than doubled, but then dropped to more typical levels in the following months. Moreover, contract conversions favoured work-in-shift job contracts as opposed to part-time job contracts. The share of conversions to work-in-shift job contracts with the consent of the employee increased from 19.9% in 2019 to 31.7% in 2020, while those without the consent of the employee increased from 8% to 14.7%.

1.5.4. Unemployment and labour force participation

In the second quarter of 2020, the number of the unemployed decreased compared to 2020Q1, to 759.6 thousand persons, but it stayed smaller than the respective number in 2019Q2 (795.6 thousand); hence, the number of the unemployed decreased by 36 thousand over the past year. The unemployment rate, which is the share of the labour force looking for a job without finding one, also increased. However, this increase was small; hence, the unemployment rate for persons aged 15-64 stood below its 2019 levels for both quarters. What is important, though, is that the seasonal decline that usually takes place in the second quarter of the year did not happen in 2020. On the contrary, the unemployment rate increased from 16.4% in 2020Q1 to 16.8% in 2020Q2. The unemployment rate increased also for women and youth aged 15-24 in 2020Q2, but for the latter, the increase was big enough to lead to a higher unemployment rate compared to 2019Q2 (36.1% vs. 33.6%). Undoubtedly, state interventions to support businesses and employment managed to constrain the unemployment increase, but it seems that youth proved more vulnerable and in need of targeted interventions.

An additional parameter that may have contributed to restraining the unemployment rate from increasing even more is the reduction of the number of labour force participants over the past year. The overall reduction in period 2019Q2-2020Q2 reached 157.5 thousand, which is bigger than the reduction in the number of the employed aged 15-64 (121.3 thousand). Women dropped out of the labour force faster than men (3.6% vs. 2.7%), while the number of youth participants aged 15-19 declined more than 13%. This could indicate the disappointment of youth, which, combined with poor job prospects, made them stop looking for work. Moreover, according to OAED's recent data, the number of the registered unemployed who were not available to work ranged from 2.4 times (in March 2019) to 1.4 times (during the summer) bigger in 2019 compared to 2020, thus restraining the increase in the number of the unemployed.[8]

1.5.5. Institutional interventions

The initiative SYN-ERGASIA (ΣΥΝ-ΕΡΓΑΣΙΑ), which was implemented on June 15, is still in effect.[9] Indeed, although the initial announcement provided that the initiative would be terminated by October 15, it was extended until the end of the year. The initiative allows eligible businesses/employees to reduce the weekly working hours of their full-time employees up to 50% and pay only for the reduced working hours. In order

8. The total number of the unemployed is the sum of the unemployed who are available to work and those who declare being unemployed (also registered in OAED), but not immediately available for work.

9. The relevant decision is available at: <https://www.hellenicparliament.gr/UserFiles/bbb19498-1ec8-431f-82e6-023bb91713a9/11281275.pd>.

to contain the drop in the compensation of these employees and avoid affecting their social security rights, the state subsidises wages equal to 60% of the initial net wage and the total amount of social security contributions (starting 1/7/2020). The total remuneration of these employees after the state subsidy cannot be lower than the minimum wage. In such a case, the state will pay for the difference. The disadvantage of the initiative is the delays reported on behalf of the state to make the necessary payments, leading to a temporary drop in wages for the beneficiaries who are working fewer hours than usual. It is certainly possible for public administration to shorten the time necessary to pay the subsidy.

In this context, the government recently announced a new programme to support the unemployed by offering employment for at least six months; the programme provides for the creation of 100 thousand jobs.[10] The average subsidy by job, which involves both wages and social security contributions, is €583 per month. The core of the programme provides for the coverage of social security contributions of the newly hired, while it also provides for a €200 bonus when the long-term unemployed are hired. All businesses/employees are eligible as long as they have no tax or social security arrears and they agree to retain the same number of personnel during the programme.

Moreover, the Ministry of Labour and Social Affairs, in cooperation with the Ministry of Health,[11] have decided to extend, until December 31, 2020, the right of firms to define the place of work of the employed persons, i.e., the right of firms to ask their personnel to work remotely, e.g., from home. At the same time, the Ministry of Labour and Social Affairs has announced a new law expected to come to a vote in October that will set the framework for work from home. Moreover, the government reduced the required amount of days worked and social security contributions paid in order for someone to be eligible for an unemployment benefit, from 100 to 50 days. Hence, it made it easier for those who usually work several months in the tourist industry to get an unemployment benefit given the difficulties facing tourism this year, i.e., low demand and much fewer hires. Similarly, the unemployment benefit for those whose beneficiary time expired in June, July and August has been extended for two months.

A very important and more general intervention to increase employment is the announced reduction in the non-wage cost of labour by three percentage points in 2021, which complements the 0.9 percentage-point reduction scheduled for the second semester of 2020. The result is the decrease of non-wage labour costs to 36.66% of gross earnings, which is expected to increase labour demand. The reduction will involve deductions for third parties, and it will not affect social security fund revenues (main and supplementary insurance), which is a main argument against reducing social security contributions.

1.5.6. Conclusions

The labour market was hit hard not only by the pandemic and the measures of social distancing that were introduced to stop its spread, but also by the restrictions in travelling and the drop in exports. The same thing happened to other countries also. However, given that Greece relies on tourism more than other countries, the hit may be stronger. The state moved quickly and tried to restrain layoffs and support businesses both with the initiative SYN-ERGASIA and through ensuring liquidity for firms with the programme of refundable deposits and with lowering rents. Even though these interventions move towards the right direction, they could not have fully compensated for the losses, given the severity of the blow, and boost employment, especially when the reduced demand for goods and services depends also on exports. Therefore, it is necessary to find alternatives, such as investments in manufacturing for the implementation of green energy projects and in construction for the implementation of works to fight natural disasters, which seem likely to occur even more frequently in the near future. The health industry should also be supported not only to fight the pandemic, but also because the population is getting older, hence the demand for health services is expected to increase in the future. Perhaps it would be a good idea to encourage the employed working fewer hours because of the pandemic to attend seminars to improve their skills, especially in new technologies, so that they make good use of their free time and improve their employability.

Unfortunately, the adverse situation in the labour market increases the number of the inactive persons,

10. The relevant decision is available at: <https://www.hellenicparliament.gr/UserFiles/bbb19498-1ec8-431f-82e6-023bb91713a9/11374556.pdf>.

11. See: <https://diavgeia.gov.gr/doc/%CE%A9%CE%A71%CE%9246%CE%9C%CE%A4%CE%9B%CE%9A-%CE%A88%CE%9B?inline=true>.

either forcing those who lost their job or/and the unemployed who cannot find work out of the labour force or by delaying the transition to the labour market of those who were already inactive, e.g., youth, students, housewives, etc. Activating these groups and motivating them to re-enter the labour market will be tougher the longer they stay out of the labour force. The reduction of the non-wage cost of labour is expected to relieve firms from some pressure and increase somewhat net earnings for the employed, hence strengthen the demand for goods and services. If these interventions are complemented by targeted tax cuts for industries disproportionately hurt by the pandemic, given that this is possible fiscally and institutionally, multiple benefits should be expected.

KEPE, *Greek Economic Outlook,* issue 43, 2020, pp. 33-36

1.6. Fluctuations and multiple challenges for the Greek stock market

Fotini Economou

1.6.1. Introduction

The stock market is experiencing unprecedented conditions that shape a new environment of increased uncertainty on multiple levels. Although the overall impact of the pandemic on the real economy cannot be accurately assessed yet, its signs are clear and directly reflected in the course of the stock market, both domestically and internationally. Ashraf (2020) examined 67 international markets from 22/1/2020 to 17/4/2020 and found empirical evidence of the stock markets' negative reaction to the number of newly confirmed COVID-19 cases, which varies over time depending on the stage of the pandemic.

In this context, the Greek stock market recorded significant negative returns with the outbreak of the health crisis (February-March 2020). Even though some signs of recovery followed (April-May 2020), the stock market went back to negative returns (June-July 2020), recording a small increase in August 2020. However, it is still far behind the levels of the beginning of the year. At the same time, the negative effect is reflected in the market capitalization and the value of transactions being significantly reduced compared to the beginning of the year and the respective period of the previous year. Moreover, apart from the uncertainty resulting from the COVID-19 pandemic, geopolitical challenges posed by Turkish policy cause concern, which, in turn, is reflected in stock market returns. It is an explosive mix that, combined with the long-standing problems of the Greek capital market (e.g., low liquidity), keeps stock returns low when the US market is reaching historically high levels and European stock markets have recovered to a considerable extent since the outbreak of the pandemic.

This article presents the recent course of the Greek stock market, placing emphasis on key stock market indices and data, while the last section of the article summarizes and concludes.

1.6.2. Developments in the stock market during the first eight months of 2020

The course of the stock market remains sluggish with the main indices of the Athens Stock Exchange (ATHEX) still far from their pre-COVID-19 levels. According to ATHEX data (Table 1.6.1), the stock market recorded significant losses during the first eight months of 2020. More specifically, the Athex Composite Share Price Index has recorded losses of -30.84% since the beginning of the year, reaching 633.98 points at the end of August 2020, from 916.67 points at the end of 2019. After a period of significant fluctuations, from February onwards, there was an increase of 2.65% in August. The picture is similar for the FTSE/ATHEX Large Cap index, which has recorded losses of -34.14% since the beginning of the year, closing with a small increase (1.87%) in August 2020. A similar course was followed by the other indices as well as the individual industry indices, with the only positive exception being FTSE/ATHEX Utilities index with a return of 9.58% since the beginning of the year and 5.03% in August 2020. The highest losses since the beginning of the year were recorded for the FTSE/ATHEX Banks index with losses of -63.24%, which, however, increased by 7.43% in August 2020.

According to ATHEX (2020) data, the upward trend of the market in August 2020 was also reflected in the increase of the ATHEX capitalization by 2.6%, reaching €37.45 billion at the end of the month, from €36.49 billion last month (Figure 1.6.1). In addition, there was a decrease of -20.8% compared to the respective capitalization of the same month last year, which was at €47.30 billion. The value of transactions was significantly reduced to €638.18 million in August 2020, recording a decrease of -44.8% compared to the previous month (€1,155.94 million) and a decrease of -53.9% compared to August 2019 (€1,382.98 million). Note that this value is the lowest since July 2018, which was at €550.73 million. Moreover, the participation of foreign investors in the capitalization of the ATHEX (excluding the participation of the Hellenic Financial Stability Fund - HFSF) reached 65.75% in August 2020, from 68.86% in December 2019. Taking into account the participation of HFSF in the total capitalization, the participation of foreign investors reached 64.57% in April 2020, from 66.35% in December 2019.

TABLE 1.6.1 Prices and returns for selected indices of the ATHEX in 2020 (up to 31/8/2020)

	31/8/2020	31/12/2019	Year min	Year max	Year change (%)
FTSE/ATHEX Mid & Small Cap Factor-Weighted Index	2,462.07	2,975.68	2,028.59	3,205.70	-17.26%
Hellenic Mid & Small Cap Index	951.71	1,253.49	701.19	1,312.90	-24.08%
Athex All Share Index	154.99	215.66	122.81	223.49	-28.13%
FTSE/Athex Mid Cap	837.69	1,195.17	659.09	1,298.86	-29.91%
Athex Composite Share Price Index	633.98	916.67	469.55	949.20	-30.84%
FTSE/Athex Large Cap	1,513.39	2,298.02	1,135.79	2,371.26	-34.14%
FTSE/Athex Utilities	3,490.71	3,185.42	1,865.80	3,530.60	9.58%
FTSE/Athex Telecommunications	3,771.09	3,925.16	2,480.07	3,960.95	-3.93%
FTSE/Athex Technology	778.17	900.44	537.98	1,029.21	-13.58%
FTSE/Athex Health Care	418.73	504.83	395.48	508.96	-17.06%
FTSE/Athex Consumer Goods & Services	7,681.10	9,810.13	5,596.91	10,280.00	-21.70%
FTSE/Athex Industrial Goods & Services	1,989.41	2,561.57	1,302.84	2,712.84	-22.34%
FTSE/Athex Food & Beverage	8,368.32	11,264.09	5,768.28	13,004.12	-25.71%
FTSE/Athex Insurance	1,447.01	2,025.02	1,076.29	2,088.80	-28.54%
FTSE/ATHEX Real Estate	3,862.33	5,465.04	2,945.19	5,826.74	-29.33%
FTSE/Athex Construction & Materials	2,128.05	3,083.14	1,403.78	3,344.96	-30.98%
FTSE/Athex Retail	47.87	69.64	38.18	75.77	-31.26%
FTSE/Athex Travel & Leisure	1,215.24	1,939.68	904.20	2,084.49	-37.35%
FTSE/Athex Financial Services	623.29	996.89	548.44	1,123.81	-37.48%
FTSE/Athex Basic Resources	3,834.86	6,458.00	2,713.19	7,435.44	-40.62%
FTSE/Athex Energy	2,898.62	5,048.57	2,268.39	5,154.35	-42.59%
FTSE/Athex Banks	325.35	885.16	263.25	889.92	-63.24%

Source: Daily official list of trading activity of the ATHEX (31/8/2020 and 31/12/2019).

Finally, the Hellenic Corporate Bond Price Index[1] and the Hellenic Corporate Bond Index[2] recorded a small increase of 0.23% and 0.50%, respectively, while their returns from the beginning of the year were still negative (-4.95% and -2.77%, respectively). At the same time, the cash value of settled transactions of corporate bonds further decreased to €6.86 million in August 2020, from €12.93 million in August 2019 (-46.90%).

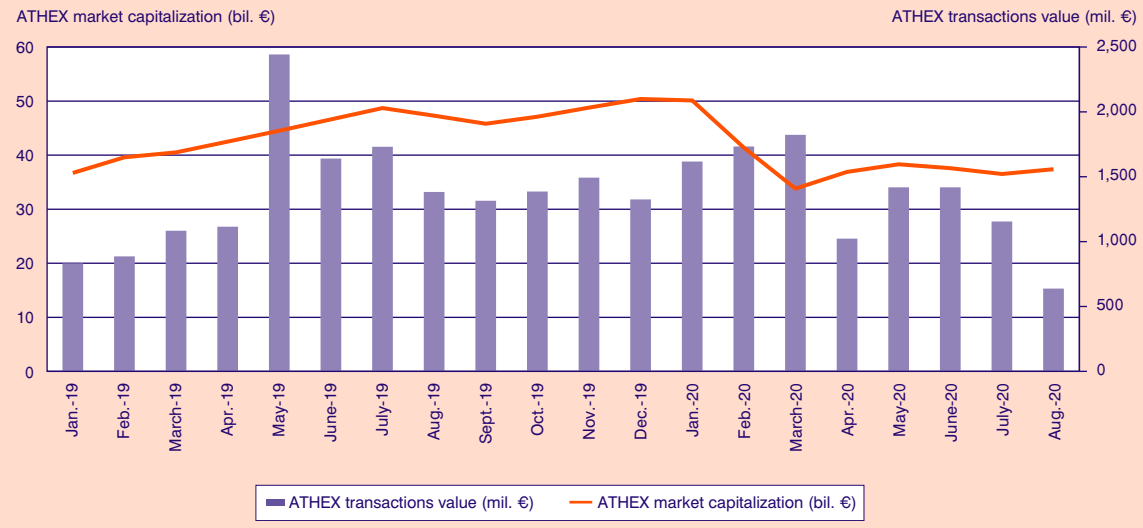
1.6.3. Stock market and uncertainty

The observed stock market fluctuations are also reflected in the course of the KEPE GRIV implied volatility index, which 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.

1. Based on the net price of each bond.

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

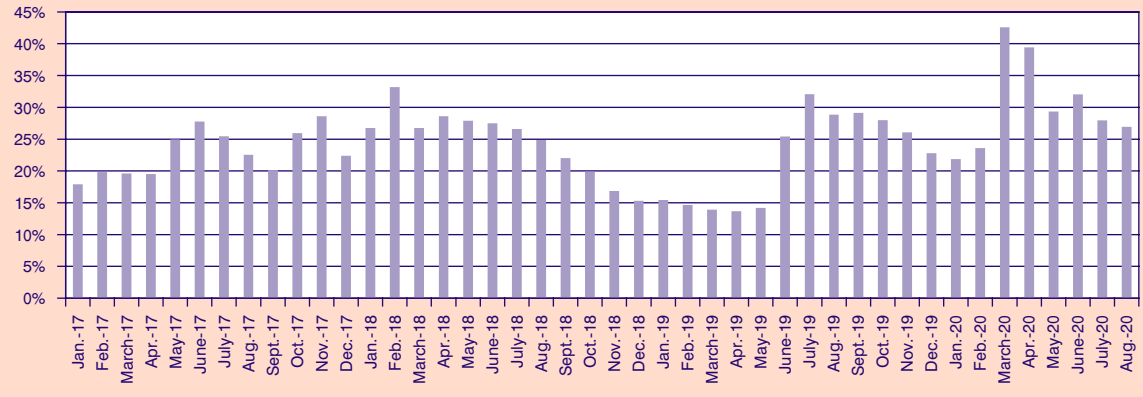
FIGURE 1.6.1
ATHEX market capitalization and transactions value 2019-2020 (up to 31/8/2020)



Source: Athens Exchange Group, Monthly Statistics Bulletin AxiaNumbers, Securities Market, August 2020.

In August 2020, the index decreased for the second consecutive month, reaching 25.67% on 31/8/2020 from 26.46% on 31/7/2020 and moving below its historical average (since January 2004) for the Greek market, which stands at 33.21%. The evolution of the index reflects a decrease in investor uncertainty for the Greek market, given the health, political and economic developments at domestic and European levels. It should be noted, however, that although the index shows a gradual de-escalation, it is far from the pre-COVID-19 levels of January 2020 (22.77% on 31/1/2020). The average daily value of the index per month also decreased in August 2020 (26.93%), standing at its lowest level since February 2020 when the first confirmed cases of COVID-19 were recorded in Greece (Figure 1.6.2).

FIGURE 1.6.2
Average daily value of the KEPE GRIV index per month from January 2017 to August 2001



Source: Centre of Planning and Economic Research.

1.6.4. Conclusions

It is evident that the spread of COVID-19 has adversely affected international stock markets, leading to increased risk and significant losses. Although the reaction of individual markets varies depending on the severity of the pandemic in each country, the resulting uncertainty about the course of the pandemic and its economic impact make markets highly volatile and unpredictable (Zhang et al., 2020).

This development, combined with domestic risk factors, keeps the Greek stock market at low levels. Even though the course of the main stock market indices, the capitalization and the KEPE GRIV "fear" index provided encouraging signs in August 2020, the significant decrease in the value of transactions and the strongly negative returns of the banking sector cause concern. In addition, the Greek stock market is facing several challenges that prevent it from following the observed recovery in the international stock markets and hold it at levels much lower compared to the beginning of the year.

An important development of the period under examination was the Law 4706/2020 on corporate governance and capital market modernisation that was published in July 2020. This development was expected for several months and is considered particularly positive to further shield the Greek capital market and promote corporate governance in order to strengthen investor confidence. In addition, the successful reissue of the 10-year bond (issued in June 2020) in early September, from which €2.5 billion were raised with a very low interest rate of around 1.2%, is a sign of confidence in the Greek economy despite the objective difficulties and challenges it is called upon to face. In the same spirit, the issue of the 52-week Greek Government Treasury bill (T-bill) of September 2020 had zero yield, compared to 0.25% in the previous issue of June 2020, while the yield of 26-week T-bill of the August issue was zero, compared to 0.02% in the previous issue of July 2020. So, it remains for this climate of confidence to be reflected in the course of the stock market.

The following months remain crucial for the course of the domestic and global economy. Obviously, the healthcare crisis has adversely affected the international stock markets. In this context, the Greek stock market should promote growth through business financing in the current difficult economic situation.

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KEPE, *Greek Economic Outlook,* issue 43, 2020, pp. 37-40

1.7. Recent developments and prospects of the global economic activity: Signs of recovery amid heightened uncertainty

Aristotelis Koutroulis

After the collapse of global economic activity in the first half of the year, the global economy shows signs of gradual improvement. Extensive policy support in the form of expansionary fiscal and monetary policy measures has played a key role in preventing an even larger economic contraction worldwide. Nevertheless, elevated uncertainty among households and corporations threatens to stifle the recovery of the global economy.

1.7.1. Recent developments and short-run prospects of the global economy

Economic activity

The Covid-19 pandemic and the administrative measures to contain it have led the world economy to its deepest recession since the Second World War. According to international organizations, global GDP this year is expected to shrink by 3.2 to 5.2 percentage points (see Table 1.7.1).

Owing to the gradual lifting of containment measures across the globe since June, global economic activity has started showing signs of improvement. However, the return to normalcy has been far from smooth. Renewed outbreaks of the virus in many regions weigh on confidence and heighten uncertainty. As a result, the recovery of consumer spending is held back, with the demand for services (e.g., accommodation and catering services, personal transport, entertainment, etc.) receiving the greatest pressure. At the same time, there is a surge in household savings for precautionary reasons. On the business side, the extremely low interest rates and the high availability of loanable funds do not seem sufficient, at least for the time being, to reverse the negative climate and restore private investment to the desired levels.

Inflation and Unemployment

The sharp drop in oil and commodity prices in combination with weak demand for consumer and capital goods has pushed inflation to historically low levels. Specifically, the average annual inflation rate in developed and developing economies in 2020 is expected to fall to 0.3% and 4.4%, respectively (IMF, 2020). With inflation ranging at particularly low levels, central bank authorities have enough policy room to maintain the strong monetary policy support and convince investors that policy rates will be kept low for as long as economies remain fragile.

Regarding employment, labor markets around the world have come under extreme pressure. Particularly worrying is the sharp rise in unemployment in the US where, according to the IMF's projections, the annual unemployment rate this year will climb from 3.7% to 10.4%, with low-wage earners and young people suffering the most. On the contrary, despite the significant reduction in total working hours, the increase in unemployment rates in the euro area and Japan appears limited due to government intervention and due to the increase in part-time work. In most developing countries, the room for similar interventions is very small. Therefore, the increase in unemployment in these countries automatically implies an increase in the risk of poverty for the affected households.

International trade

Due to its pre-cyclical behavior, international trade has always been one of the main recipients and transmitters of economic recessions. In this sense, and given the special features of the current economic downturn, the total volume of international trade (goods and services) in 2020 is expected to shrink by 11.2 percentage points (see Table 1.7.2). This decline reflects (a) the anemic demand for consumer goods in destination countries, (b) the restrictions on international passenger transportation and cross-border tourism, (c) the increased transport costs due to stricter standards and controls, and (d) the disruptions in global production chains.

Economic policy and the short-run prospects of the global economy

The short-run prospects of the global economy depend crucially on (a) the intensity and duration of pos-

TABLE1.7.1 Real Gross Domestic Product[1,2]

(annual percentage changes)

	2019*				2020**				2021**			
	IMF	OECD	UN	WB	IMF	OECD	UN	WB	IMF	OECD	UN	WB
World economy	2.9	2.6	2.6	2.4	-4.9	-4.5	-3.2	-5.2	5.4	5	4.2	4.2
Advanced economies	1.7	:	1.9	1.6	-8	:	-5	-7	4.8	:	3.4	3.9
USA	2.3	2.2	2.3	2.3	-8	-3.8	-4.8	-6.1	4.5	4	3.9	4
Eurozone	1.3	1.3	1.5	1.2	-10.2	-7.9	-5.8	-9.1	6	5.1	2.9	4.5
Japan	0.7	0.7	0.7	0.7	-5.8	-5.8	-4.2	-6.1	2.4	1.5	3.2	2.5
United Kingdom	1.4	1.5	1.4	:	-10.2	-10.1	-5.4	:	6.3	1.4	3	:
Developing economies	3.7	:	3.7	3.7	-3	:	-0.7	-2.4	5.9	:	5.3	4.7
Brazil	1.1	1.1	1.1	1.1	-9.1	-6.5	-5.2	-8	3.6	3.6	2.9	2.2
Russia	1.3	1.4	1.3	1.3	-6.6	-7.3	-4.3	-6	4.1	5	2.9	2.7
India	4.2	4.2	4.1	4.2	-4.5	-10.2	1.2	-3.2	6	10.7	5.5	3.1
China	6.1	6.1	6.1	6.1	1	1.8	1.7	1	8.2	8	7.6	6.9

Sources: IMF, *World Economic Outlook, Update,* June 2020; OECD, *OECD Interim Economic Assessment,* September 2020, United Nations, *World Economic Situation and Prospects as of mid-2020;* World Bank, *Global Economic Prospects,* June 2020.

* 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 1.7.2 World trade volume
(annual percentage changes, goods and services)

Volume of international trade - goods and services (annual percentage changes)	2019*	2020**	2021**
World economy	0.9	-11.9	8
Advanced economies	1.5	-13.4	7.2
Developing economies	0.1	-9.4	9.4

Source: IMF, *World Economic Outlook, Update,* June 2020.

* Estimations, ** Projections.

sible outbreaks of the disease, (b) the fluctuations in public confidence regarding national governments' confinement measures, (c) the time frame for producing and making widely available an efficacious and safe vaccine, and (d) the degree of effectiveness of fiscal and monetary policy measures. Assuming that the Covid-19 will fade into a less threatening virus over the next six months, global GDP is projected to increase by 4.2 to 5.4 percentage points (see Table 1.7.1 above). The realization of this forecast presupposes, *inter alia,* that national economic policies will maintain their supportive role. In addition, it is important to coordinate national economic policies and keep borders open so as to strengthen international trade. Finally, a major issue, and therefore a political priority, is the further strengthening of national health systems.

1.7.2. Possible economic impacts of the pandemic in long run

Since 1870, the world community has experienced 14 global economic recessions: in 1876, 1885, 1893, 1908, 1914, 1917-21, 1930-32, 1938, 1945-46, 1975, 1982, 1991, 2009 and 2020 (World Bank, 2020). The historical testimony regarding past crises allows us to infer two important conclusions: First, the outbreak of global economic crises is characterized by a periodicity –one crisis per decade. Second, every economic crisis has a beginning and an end. The historical experience also suggests that the effects of economic crises on global GDP growth are not uniform, but can go in different directions depending on the particularities of economic episodes. In this respect, it is important to know whether the current crisis features some distinct qualities and whether these qualities have the potential to generate long-lasting changes in the global economy.

According to World Bank analysts, the outstanding features of the Covid-19 recession are related to its depth, synchronization and timing. First and foremost, it is the deepest crisis in terms of global GDP contraction since 1975 (see Table 1.7.3). Second, the current crisis exhibits the highest synchronization ever observed as more than 90% of national economies are projected to register negative GDP changes within the same year. Third, it is the first economic crisis triggered solely by a public health crisis. Finally, the decade preceding the outbreak of the pandemic is characterized by a general slowdown in productivity growth (World Bank, 2020).

The high likelihood of a further slowdown in productivity growth after a decade of poor performance is quite concerning. In particular, the declining investment rates (due to heightened uncertainty), the lower rates of human capital accumulation (due to elevated unemploy-

TABLE 1.7.3 Global GDP annual percentage changes during recessions (1975-2020)

	1975	1982	1991	2009	2020
World economy	1.1	0.4	1.3	-1.8	-5.2
Advanced economies	0.2	0.3	1.3	-3.4	-7
Developing economies	4.2	0.9	1.5	1.8	-2.5

Source: World Bank, *Global Economic Prospects,* June 2020.

ment and lost teaching hours at all levels of education), and the limited diffusion of new technologies across countries (due to disruptions of global production chains) may have a long lasting effect on productivity growth. Similar effects can be caused by limited labor mobility from low to high productivity sectors. In a nutshell, owing to its special nature, the current crisis has the potential to disrupt all those factors which are considered as key drivers of productivity growth in the long run (Alistair, 2020).

Social distancing is quite worrying as well. The restrictions placed on face-to-face human communication poses an extraordinary threat to people's mental health. Consciously or subconsciously, social distancing 'freezes' human relationships, creates a lack of trust, and alienates people. To put it more compactly, social distancing leads to a counterproductive socio-economic environment. Arguably, the longer it will take to restore people's trust and rebuild their confidence in socioeconomic institutions, the longer it will take to repair the economic damage done by the pandemic.

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2. Fiscal developments

KEPE, *Greek Economic Outlook,* issue 43, 2020, pp. 41-47

State Budget, public debt and fiscal figures perspectives

Elisavet I. Nitsi

2.1. State Budget execution, January-August 2020

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 Jan.-Aug. 2020 is more deficient compared to the corresponding period of 2019, as well as compared to the monthly targets set, as they were reflected in the executive summary of the State Budget for the fiscal year 2020; higher revenues were expected, as well as higher public expenditures. This deficit was expected, given the health crisis due to the COVID-19 pandemic since March 2020 and the consequent economic crisis. In particular, the country's high dependence on tourism, which has been hit by the lockdown and continues to suffer from travel restrictions and local lockdowns, as well as the high proportion of its self-employed workforce, has led to a significant economic downturn. Reduced economic activity and measures to face the pandemic have weighed on both revenue and expenditure.

According to the data shown in Table 2.1.1, the State Budget presents a significant deficit in the balance, amounting to 9.68 billion euros in the period Jan.-Aug. 2020 against a deficit of 1.59 billion euros in the corresponding period of 2019 and a target for deficit of 2.89 billion euros. The State Budget Primary Balance displayed a significant deficit of 5.48 billion euros in comparison to a primary surplus of 2.91 billion euros for the same period in 2019 and a primary surplus target of 1.15 billion euros.

Net revenues of the State Budget are reduced compared to the corresponding period of the previous year, as they amounted to 30.1 billion euros, showing a decrease of 3.1 billion euros or 9.3% compared to the revenues of the corresponding period of 2019 and 2.4 billion euros or 7.4% against the targets set by the 2020 Budget. Public Investment Program (PIP) revenues reached 3.8 billion euros, showing an increase compared to both the corresponding period of 2019 (2.28 billion euros or 150%) and the budget target (1.29 billion euros or 51.1%). The reduction in revenues is mainly due to the reduced economic activity that stemmed from the health crisis, as well as the impact of the measures taken to address it. More specifically, tax revenues decreased by 3.5 billion euros or 11.6% compared to the same period of the previous year and by 2.4 billion euros or 7.4% compared to the 2020 Budget target. Sales of Goods and Services, which amounted to just 317 million euros, decreased by 1.2 billion euros or 79.3% compared to the same period of 2019, although this decline was projected in the 2020 Budget, as it falls short of its target by just 135 million euros or 29.87%. It should be noted that the largest decrease is shown in the collection of VAT, which amounted to 10 billion euros, compared to both the corresponding period of 2019 and the Budget target, by about 3.5 billion euros or 16.5%, followed by income tax, by about 650 million euros or 7.1%. On the contrary, transfers, amounting to 4.15 billion euros, show a significant increase, compared both to the corresponding period of 2019 (1.48 billion euros or 56.2%), and to the Budget target (1.41 billion euros or 52.1%), which is due, on the one hand, to the increased revenues of PIP and, on the other hand, to the collection of ANFAs (644 million euros for 2020), which was not foreseen in the 2020 Budget.

On the side of the State Budget expenditures, which amounted 39.73 billion euros, the State Budget in the period Jan.-Aug. 2020 displays an increase of 5.01 billion euros or 14.44% compared to the corresponding period of 2019, and 4.39 billion euros or 12.41% against the target set by the 2020 State Budget. The main reasons for the increased expenditure compared to the target set by the Budget is due to the measures taken in order to strengthen the health system and the economy due to the COVID-19 pandemic by

1. Based on data published in the State Budget Execution Monthly Bulletin: August 2020.

TABLE 2.1.1 State Budget execution, January-August 2020 (mill. €)

	Jan.-Aug. 2019	Jan.-Aug. 2020		2020	2020
	Outcome	Outcome	Budget estimates 2020[1]	Budget forecasts 2020[2]	Budget estimates 2021[3]
State Budget					
Net Revenue	**33,130**	**30,050**	**32,455**	**54,710**	**50,147**
Taxes	30,520	26,996	30,641	52,165	44,594
From which:					
VAT	12,007	10,022	12,018	18,276	14,864
Excise taxes	4,705	4,248	4,763	7,214	6,519
Property taxes	726	572	645	2,829	2,690
Income tax	9,289	8,621	9,276	16,663	13,943
Social contributions	37	36	37	55	54
Transfers	2,635	4,116	2,707	4,592	6,803
Sales of goods and services	1,532	317	452	687	556
Other current revenue	1,368	1,911	1,126	1,806	2,741
Sales of fixed assets	5	6	0	332	326
Tax refunds	2,980	3,332	2,826	4,926	4,926
Expenditure	**34,718**	**39,731**	**35,346**	**57,163**	**68,528**
Compensation of employees	8,905	8,880	8,902	13,390	13,410
Social benefits	320	82	53	134	232
Transfers	17,930	20,390	17,275	27,844	36,596
Purchases of goods and services	745	696	570	968	1,564
Subsidies	119	66	43	89	102
Interest payments (gross basis)	4,499	4,203	4,044	6,000	5,850
Other current expenditure	36	19	50	71	72
Non allocated expenditure (without PIP)	0	0	773	8,245	10,068
Purchase of fixed assets	165	208	337	421	636
PIP					
Revenue[4]	1,526	3,807	2,513	4,100	6,230
Expenditure	2,000	5,187	3,300	6,750	9,521
State Budget Primary Balance	**2,906**	**-5,484**	**1,152**	**3,547**	**-12,538**
State Budget Balance[5,6,7]	**-1,588**	**-9,681**	**-2,892**	**-2,453**	**-18,381**

Source: State Budget Execution, General Accounting Office, Ministry of Finance.

Notes:
1. Budget targets, according to the total estimates as depicted in the 2020 Budget introductory report.
2. Budget estimates, as depicted in the 2020 Budget introductory report, according to the European System of Accounts (ESA).
3. Budget estimates, as depicted in the 2021 Budget Draft Report, according to the European System of Accounts (ESA).
4. Public Investment Budget revenues are included in lines "Transfers" and "Other current revenues".
5. + surplus, - deficit.
6. Outcome includes the settlement program of previous years' arrears and pending pension applications.
7. Data is presented according to the new economic classification (Presidential Decree 54/2018).

paying "special purpose" compensation to employees and scientists, strengthening businesses in the form of a repayable advance, the extraordinary grant to EFKA and EOPYY to cover the backlog of revenues from reduced social security contributions and the increased outflows of the PIP to finance mainly the "special purpose" compensation of small businesses and self-employed medium-sized enterprises, the support of enterprises in the form of a repayable advance, for the TEPIX II action and for the establishment of a corporate guarantee fund due to the COVID-19 pandemic. More specifically, the transfers are particularly high, by 1.48 billion euros or 13.72% compared to the corresponding period of 2019 and 1.41 billion euros or 18.03% regarding the Budget target, a Budget code from which "special purpose" compensation was paid to employees and scientists (1.19 billion euros) and business support in the form of a repayable advance (864 million euros). In addition, it should be noted that compared to the budget target, interest rates also appear higher, by 159 million euros or 3.93%. Finally, the expenditures of the Public Investment Program (PIP) amount to 5.19 billion euros, increased by 3.19 billion euros or 49.26% compared to the corresponding period of the previous year and by 1.29 billion euros or 57.18% compared to the target set by the 2020 Budget.

Overall, the execution of the Budget is significantly in deficit. It should be noted, however, that 2020 cannot be comparable to either these figures of the previous year or the budget forecasts that were made in November 2019, long before the COVID-19 pandemic. However, apart from the health and the consequent economic crisis, our country faced other crises as well: rising immigration, the geopolitical crisis with Turkey and successive natural disasters that required and continue to require significant emergency funds to deal with. An adjustment of the figures, with the updated estimates for dealing with the pandemic and other crises, on an annual basis, are included in the Preliminary Draft State Budget of 2021. However, these estimates are not presented on a cumulative cash basis like the data of the monthly execution of the State Budget, but are based on the ESA methodology, and therefore the last two columns of Table 2.1.1. present the data with this methodology.

A comparison of the forecasts and the latest estimates for 2020 shows that the measures taken or to be taken by the government to address both the health and the economic crises affect both revenue and expenditure. The reduced revenues compared to the Budget targets (4.56 billion euros or 8.34%) are mainly due to the reduced tax revenues (7.5 billion euros or 14.51%), of which the main loss is from VAT (3.41 billion or 18.67%) followed by income tax (2.72 billion euros or 16.32%); these taxes were not collected due to reduced economic activity. The increase in transfers is positive, which partly improves revenue.

In terms of expenditure, which includes all actions to address the effects of the Covid-19 pandemic, as well as other crises that the country faces (migration, natural disasters), the deviation from the 2020 Budget target is even greater and reaches 12.37 billion euros or 19.88%. Transfers show a more significant discrepancy (8.75 billion euros or 31.43%) as this category includes measures to deal with the Covid-19 pandemic amounting to 6.53 billion euros, such as the "special purpose" compensation to employees whose employment contracts were temporarily suspended and the coverage of their social security contributions, the "special purpose" compensation to scientists, the repayable advance, the additional health expenses etc., as well as other expenditures such as the subsidy in e-EFKA for the payment of retroactive payments to the pensioners following the relevant court decisions. The category of the non-allocated expenditure, which mainly includes PIP expenditure and the regular and special reserve, is the second that led to this discrepancy (11.82 billion euros or 22.11%) as it results in increased payments of PIP due to the response to the pandemic with measures amounting to 4.34 billion euros, such as the "special purpose" compensation for the self-employed and employers affected by the pandemic, part of the repayable advance, etc. In total, all interventions to strengthen the Greek economy and deal with the multiple crises that have arisen in 2020 (health, economic, immigration, natural disasters) amount to almost 24 billion euros.

2.2. The evolution of Greek public debt, second quarter 2020

According to the latest data available from the General Accounting Office,[2] for the second quarter of 2020 the Central Government's debt amounted to €362,871.42 million, an increase of approximately €1 billion (0.3%) compared to the previous quarter, €6.9 billion (1.9%) in relation to end of the year 2019 and €3.6 billion (15.6%) compared to the corresponding quarter of 2019. In addition, cash deposits decreased by €6.4 billion (25%) compared to the previous quarter and €3.6 billion (15.6%) compared to the end of 2019.

2. Public Debt Bulletin, August 2020, General Accounting Office, Ministry of Finance.

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

Period	2019 (B΄ quar.)	2019 (D΄ quar.)	2020 (A΄ quar).	2020 (B΄ quar.)
Outstanding Central Government debt	**356,549.40**	**356,014.92**	**361,828.74**	**362,871.42**
Debt by type of interest rate				
Fixed rate[2]	332,304.04	336,790.11	346,631.93	350,170.92
Floating rate[2,3]	24,245.36	19,224.81	15,196.81	12,700.50
Debt by way of trading				
Tradable	72,736.08	64,663.70	69,109.29	74,388.64
Non-Tradable	283,813.32	287,660.06	292,719.45	288,482.78
Debt by currency				
Eurozone	349,774.96	352,098.76	357,848.62	358,879.83
Non-eurozone currencies	6,774.44	3,916.16	3,980.12	3,991.59
Cash Deposits of the H.R.[4]	**20,823.90**	**22,818.80**	**25,675.20**	**19,267.30**
Debt Guaranteed by the Central Government	**10,476.68**	**9,972.02**	**9,987.61**	**9,862.58**

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 euros on 31/3/2020 & 30/6/2020.

* Estimates.

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

The composition of Central Government debt in the second quarter of 2020 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 96.5% and 3.5%, respectively. There is a change in the composition of debt in favor of floating rates as compared to the previous quarter (95.8% and 4.2%), but mainly in regard to the corresponding quarter of 2019 (93.2% and 6.8%, respectively). An analogous change is observed in favor of the non-tradable to tradable debt, which stood at 20.5% and 79.5%, respectively, over the period considered. Finally, the composition of Central Government debt by currency remained essentially unchanged compared with the previous quarter, 98.9% in euro currency, and shows little variation compared to the same quarter of 2019 (98% in euro). In addition, as far as the guarantees provided by the Greek government are concerned, they steadily reduced.

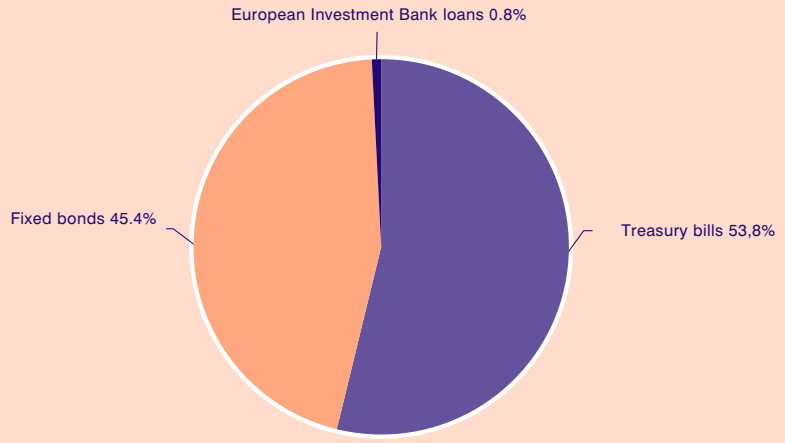
The distribution of debt, based on the residual maturity in the first semester of 2020, is reflected in Table 2.2.2. Short-term Greek government securities (with maturity of less than one year) represent 12.6% of the total, compared to 11% from the medium-term notes (with maturities of one to five years), and 76.4% from long-term issues (maturity after five years). The respective figures for the end of 2019 were 13.4%, 11.3% and 74.3%, respectively. Compared to the same quarter of 2019, a

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

Period	2019 (B΄ quar.)	2019 (D΄ quar.)	2020 (A΄ quar).	2020 (B΄ quar.)
Total volume	**356,549.40**	**356,014.92**	**361,828.74**	**362,871.42**
Short-term (up to 1 year)	47,808.00	44,329.63	48,445.79	45,868.77
Medium-term (1 to 5 years)	35,601.10	36,244.63	40,713.15	39,938.88
Long-term (more than 5 years)	273,140.30	275,441.25	272,669.80	277,063.77

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

GRAPH 2.2.1
Composition of borrowing for the period Jan.-June 2020



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

decrease in the share of short-term securities can be observed along with a corresponding increase in the medium-term securities.

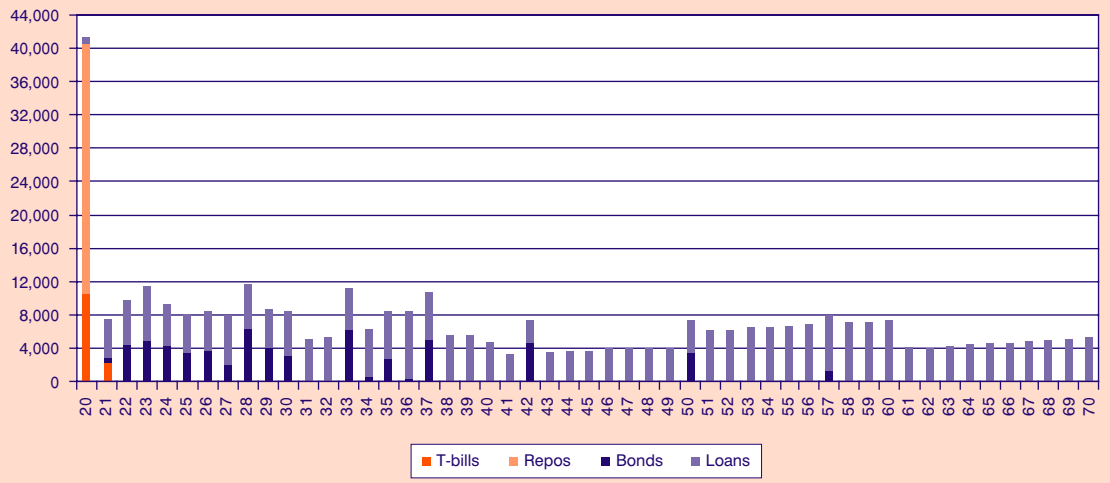
The average residual maturity of the total Central Government debt stood at 20.85 years, slightly increased from that of 20.17 years in the corresponding quarter of 2019. It should be noted that the average residual maturity of the total Central Government debt has tripled since the country's entry into 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, a significant increase from the level of 4.05 years at the end of 2019.

The new borrowing for the first half of 2020 decomposes to 53.8% of Treasury Bills and 45.4% of fixed bonds, while only 0.8% comes from European Investment Bank loans (Graph 2.2.1).

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

In conclusion, although the debt showed an increase in the last quarter, it 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

GRAPH 2.2.2
Redemption schedule of Budgetary Central Government debt on 30/6/2020 (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 Eurogroup of 22-6-2018.

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.

2.3. Fiscal figures perspectives

The country's Budget execution for the rest of 2020 and 2021 depends on the course of the health crisis, as additional budgetary interventions are likely to be undertaken. In addition, for both 2020 and 2021, the government has given priority to interventions related to addressing issues of National Defense and Security, as well as migration flows, which also cannot be predicted. An important element will be the level of recession in 2020, as well as the recovery of the Greek economy in 2021. If, in the end the recession in 2020 is just over 8% of GDP, as predicted by the Ministry of Finance, as well as all major organizations that converge with their predictions, then our country will have avoided the worst.

Significant help for the execution of the Budget will be the financial tools of the Recovery and Sustainability Mechanism, as the Greek economy is expected to benefit with 32 billion euros by 2026, of which 19.3 billion euros concern grants and 12.7 billion euros concern loans with favorable interest rates and terms. Of this, 16.2 billion euros concern the Recovery and Resilience Facility, 2.3 billion euros REACT-EU, 0.4 billion euros the Just Transition Fund and 0.4 billion euros the European Agricultural Fund for Rural Development.

Greece, like the other Member States, will have to draw up national recovery and resilience plans to use the Recovery and Resilience Mechanism, which will present the country's development plan. Key pillars are green growth and the digital transformation and technological upgrading of the public and private sectors, which are expected to eventually absorb more than 50% of the Fund's resources. The National Recovery and Sustainability Plan of Greece, based on the Preliminary Draft Budget of 2021, is expected to be submitted and approved in the first half of 2021, during which the first disbursement (advance) for the Recovery and Sustainability Mechanism is likely to take place. This will include reforms implemented from February 2020 onwards, and therefore the absorption of the relevant resources can begin before its formal approval.

In addition to the Recovery and Resilience Mechanism, the contribution of REACT-EU, which is a bridge program and includes actions and expenditure to address the Covid-19 crisis, will be significant in 2021. In total, the resources provided by all the tools of the Next Generation EU mechanism, including loans, are expected to exceed 5.5 billion euros.

It is obvious that the contribution of the European funds will be a significant relief for the country's fiscal figures, but the better and more efficient use of these funds will also play an important role. The preparation of both the National Recovery and Sustainability Plan and the actions to be included in REACT-EU are important tools for the government. If they are used in projects and reforms with a development strategy, they could lead to the improved productivity and efficiency of the Greek economy, to its shift to modern models of development oriented towards green and digital transition, and axes of strengthening investment, extroversion and upgrading infrastructure in the sectors of health, education and production. Thus, it will increase economic activity, resulting in a faster exit from the economic crisis, while the multiplier effect on the country's GDP will lead to greater economic growth and the improvement of the country's fiscal position. In addition, even if growth rates recover relatively quickly, as expected, the level of employment will still lag behind projections made without the pandemic, and therefore particular weight should be given to reforms that will alleviate the tax burden and non-wage labor costs.

3. Human resources and social policies

KEPE, *Greek Economic Outlook,* issue 43, 2020, pp. 48-53

3.1. Demographic developments in Greece and the EU

Vlassis Missos

3.1.1. Introduction

The European Commission's report[1] on the impact of demographic changes in Europe sets out a broad framework of policy measures and initiatives to be taken. Long-term demographic developments in the European Union (EU), combined with the rapid changes brought about by the coronavirus pandemic, are a key and substantial challenge for social protection systems in all members countries. Given the gradual and continuous aging of the general population that has been going on for at least five decades, the research focuses on differentiating the age composition of EU member states and examining their trends.

The *Interim* report for the Development Plan for the Greek Economy, published in July 2020, underlines the following: "In the medium term, the economic outlook is deteriorating due to the unfavorable demographic characteristics of the country. The number of births is declining, the age distribution is worsening at the expense of the economically active, while there is a strong negative net migration balance, especially at the most productive ages of the population".[2]

In support of these observations, the present paper examines the data concerning the long-term evolution of the basic parameters of population ageing among the member countries of the European Union. Furthermore, the discussion focuses on Greece and emphasizes the changing levels of net migration flows. As it becomes obvious, the prolonged economic recession between 2009 and 2016 was followed by a two-year phase of moderate growth that is positively related with the reversal of the net migration flows. The critical period of the pandemic has been left out of the present analysis.

3.1.2. Population ageing

The effect of population ageing on the social protection system gathers a wide range of applications.[3] On the one hand, it directly affects the relative level of input resources required for the sustainability and continuous reproduction of the system's present capacity to provide financial backup to its beneficiaries. On the other hand, population ageing increases the financial needs for covering the growing health expenditures and social transfers (pensions and benefits). The effective management of the flows and the complexity of the governmental interventions required in order to maintain its operation still remains an open issue in the public debate.

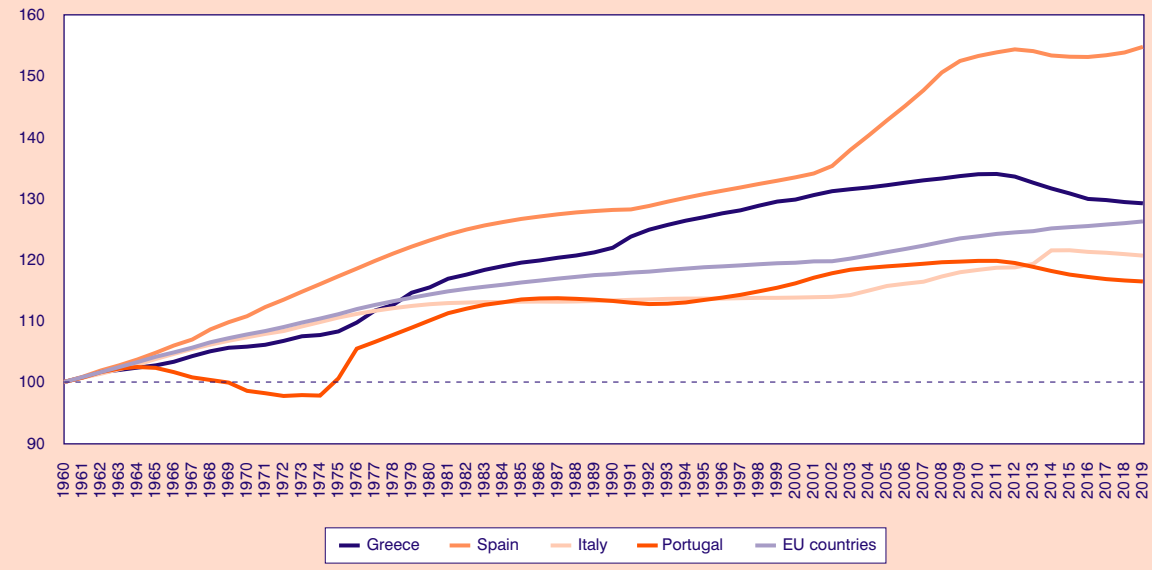
Since the early 1960s, the total population of the European Union countries is estimated to have grown by about 26%. In Figure 3.1.1, the population level has been normalized based on the year 1960 (indexed as 100) with which population changes between the countries of the European South (or the Southern European social protection system) and the EU are compared. As it becomes obvious, Spain is the country with the most significant increase to be recorded. From 1960 to 2000, the Spanish population grew by about 32% while, over the next decade, growth continued at an accelerated rate, adding another twenty percentage points. The slowdown in the population change during the European crisis, which strongly affected the Spanish economy, seems to have been

1. European Commission (2020), 'European Commission report on the impact of demographic change', Secretariat-General.

2. Pissarides C. et al. (2020), 'Development Plan for the Greek Economy', Interim Report, July 2020.

3. Galasso V. and Profeta P. (2004), Lessons for an ageing society: the political sustainability of social security systems, *Economic Policy* 19, 63-115.

FIGURE 3.1.1
Relative population change in the countries of southern Europe and the European Union, base year 1960 (100), 1960-2019



Source: Eurostat.

temporary as the rate has returned to lower, but positive, levels.

On the other hand, during the same period, Greece's population sees milder growth. More specifically, from 1960 to 2011, the population increased by 34%. Since then, during the prolonged recession of the Greek economy, this figure has fallen by five percentage points, approaching the long-term trend of the EU countries. While the population performances of Spain and Greece are higher than the European average, Italy and Portugal show much slower uptrends, below the EU average. Over the past six decades (1960-2019), the population growth of Italy just reached 20%, while that of Portugal reached 16%.

Over a long period, our country is ranked among those that are characterized by a relatively high performance of population change. The decline in the long-term trend, which occurred during the period of economic recession, needs to be further examined mainly in terms of its qualitative characteristics, which, however, reflect the corresponding developments of the EU countries. What is crucial, however, is that the level of the population increase has changed the composition of the age structure, intensifying the phenomenon of ageing.

Tables 3.1.1 and 3.1.2 refer to the percentage share of specific age groups on the total population for each country of the EU, in selected years spanning from 1971 to 2019. Table 3.1.1 includes the percentage share of the young age group ranging from 0 to 14 years old. As it is observed, while in the early 1970s young people make up over 23% of the country's total population, in 2019, they are close to 15%. A significant decline in the young population has been recorded in Italy (13.2% in 2019) and Portugal (13.7% in 2019).

Moreover, Table 3.1.2 shows the percentage share of the group aged 65 and over. While the reduction of the percentages depicted in Table 3.1.1 points towards the idea of evolving infertility, Table 3.1.2 offers a measure of continuous relative ageing. However, in all EU countries, population ageing occurs as a result of both fewer births and a gradual extension of life expectancy. As a result, rates are rising. In Greece, Portugal, Italy and Spain, the change in rates is highly significant. In central European countries, such as Austria and Belgium, increases are milder. Combining the results of Tables 3.1.1 and 3.1.2 gives a broad picture of rapid ageing that should be prioritized in the policy agenda.

TABLE 3.1.1 Age group 0-14 years old as a percentage (%) of total population, EU countries, selected years

	1971	1981	1991	2001	2011	2019
Austria	24.4%	20.2%	17.5%	16.9%	14.7%	14.4%
Belgium	23.5%	19.9%	18.1%	17.6%	17.0%	16.9%
Bulgaria	22.7%	22.1%	20.1%	15.5%	13.2%	14.4%
France	-	-	20.3%	19.1%	18.6%	18.0%
Germany	-	-	16.2%	15.5%	13.6%	13.6%
Denmark	23.2%	20.6%	17.0%	18.6%	17.9%	16.5%
Greece	25.0%	22.5%	19.2%	14.5%	14.6%	14.3%
Estonia	22.0%	21.7%	22.2%	17.4%	15.3%	16.4%
United Kingdom	24.1%	20.8%	19.1%	18.9%	17.6%	17.9%
Ireland	31.3%	30.3%	26.8%	21.6%	21.3%	20.5%
Spain	27.8%	25.7%	19.5%	14.6%	15.0%	14.8%
Italy	24.5%	22.0%	16.3%	14.3%	14.1%	13.2%
Cyprus	-	-	25.8%	22.3%	16.8%	16.1%
Latvia	21.6%	20.6%	21.5%	17.4%	14.2%	15.9%
Lithuania	26.8%	23.5%	22.5%	19.7%	14.9%	15.1%
Luxembourg	22.1%	18.6%	17.5%	18.9%	17.6%	16.1%
Malta	-	24.3%	22.9%	19.8%	15.0%	13.7%
Netherlands	27.2%	22.1%	18.2%	18.6%	17.5%	15.9%
Hungary	20.5%	22.0%	19.9%	16.6%	14.6%	14.5%
Poland	-	-	24.9%	19.1%	15.3%	15.4%
Portugal	28.5%	25.5%	20.0%	16.3%	15.1%	13.7%
Romania	25.8%	26.8%	23.3%	18.0%	15.8%	15.7%
Slovakia	27.3%	26.1%	25.1%	19.2%	15.4%	15.7%
Slovenia	-	-	20.6%	15.7%	14.2%	15.1%
Sweden	20.8%	19.4%	18.0%	18.4%	16.6%	17.8%
Czech Republic	21.2%	23.5%	21.1%	16.2%	14.5%	15.9%
Finland	24.3%	20.2%	19.3%	18.1%	16.5%	16.0%

Source: Eurostat.

TABLE 3.1.2 Group aged 65 and over as a percentage (%) of total population, EU countries, selected years

	1971	1981	1991	2001	2011	2019
Austria	14.1%	15.3%	15.0%	15.4%	17.6%	18.8%
Belgium	13.4%	14.2%	15.0%	16.9%	17.1%	18.9%
Bulgaria	9.7%	12.0%	13.4%	16.3%	18.5%	21.3%
France	-	-	14.0%	15.9%	16.7%	20.1%
Germany	13.3%	15.5%	14.9%	16.6%	20.7%	21.5%
Denmark	12.4%	14.5%	15.6%	14.8%	16.8%	19.6%
Greece	11.0%	13.2%	13.8%	17.7%	19.3%	22.0%
Estonia	11.7%	12.4%	11.7%	15.1%	17.4%	19.8%
United Kingdom	13.1%	15.0%	15.8%	15.8%	16.4%	18.4%
Ireland	11.1%	10.7%	11.4%	11.2%	11.5%	14.1%
Spain	9.7%	11.2%	13.8%	16.8%	17.1%	19.4%
Italy	-	-	15.1%	18.4%	20.5%	22.8%
Cyprus	-	-	-	11.3%	12.7%	16.1%
Latvia	12.1%	12.8%	11.8%	15.1%	18.4%	20.3%
Lithuania	10.1%	11.1%	11.0%	13.9%	17.9%	19.8%
Luxembourg	12.6%	13.6%	13.4%	13.9%	13.9%	14.4%
Malta	-	8.3%	10.3%	12.3%	15.7%	18.7%
Netherlands	10.2%	11.6%	12.9%	13.6%	15.6%	19.2%
Hungary	11.6%	13.3%	13.5%	15.1%	16.7%	19.3%
Poland	-	-	10.2%	12.4%	13.6%	17.7%
Portugal	9.7%	11.4%	13.6%	16.3%	18.7%	21.8%
Romania	8.7%	10.2%	10.6%	13.5%	16.1%	18.5%
Slovakia	9.2%	10.4%	10.4%	11.4%	12.6%	16.0%
Slovenia	-	-	10.8%	14.1%	16.5%	19.8%
Sweden	13.8%	16.4%	17.8%	17.2%	18.5%	19.9%
Czech Republic	12.2%	13.3%	12.6%	13.8%	15.6%	19.6%
Finland	9.3%	12.1%	13.5%	15.0%	17.5%	21.8%

Source: Eurostat.

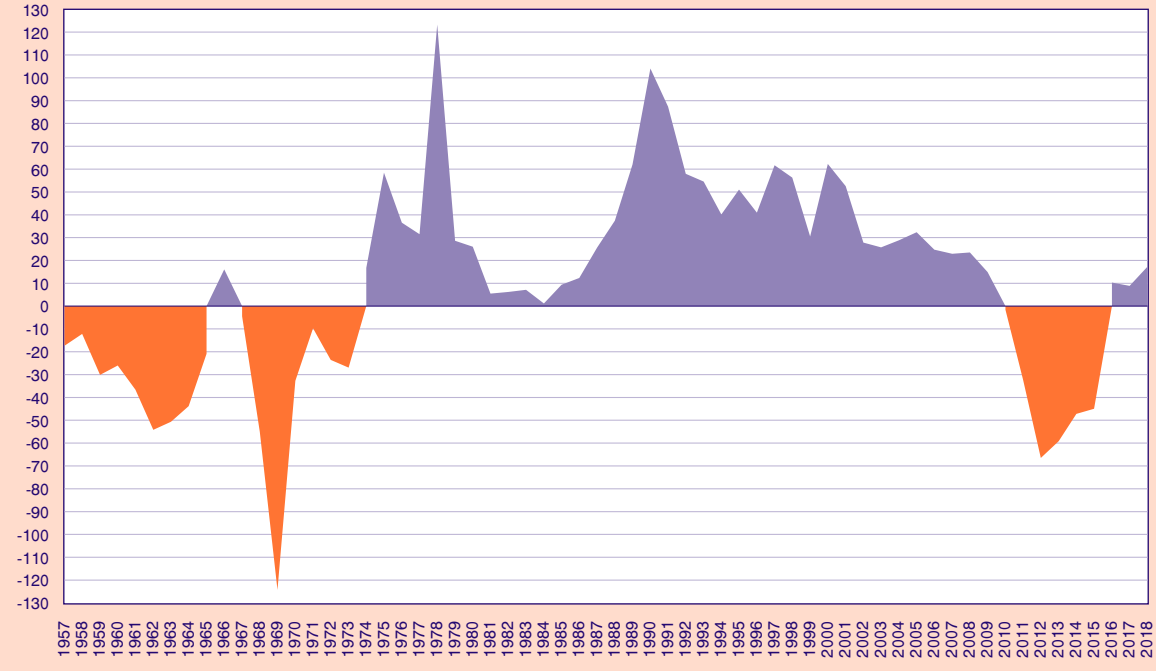
3.1.3. Net migration flows

In addition to the natural movement of the population reflected in the birth-death balance, the age distribution of the countries is also affected by migration flows. Therefore, the final population balance outcome is the result of all these parameters. Regarding Greece, the net migration flow is shown in Figure 3.1.2, depicting the long-term results from 1957 to 2018. The concept of net migration flows is derived as the difference between the birth-death balance (natural movement of the population) and the annual estimated population. When positive, it is an influx, and when negative, it is considered as an outflow of migrants. Therefore, Figure 3.1.2 does not capture the absolute number of migrants entering or leaving the country, but just the final balance.

During the period from 1957 to 1974 (with the exception of 1965), the population in Greece recorded a net migratory outflow. This trend was completely reversed during the following period spanning from 1975 to 2009. The return of the migratory outflow of the population during the period 2010 to 2015 is important for the following reasons. First, it is the first time since 1974 when the continuous inflow of population was interrupted. Secondly, the outflow of migrants takes place in a completely different socio-political environment, in which, however, the level of population ageing in Greece is more intense than in the period 1957 to 1973. Third, the time span is shorter, but on an annual basis, the migratory outflow is significantly more intense. The annual net outflow before 1974 was 35.5 thousand people (of all ages) per year, while during the financial crisis, it reached 41.9 thousand people per year.

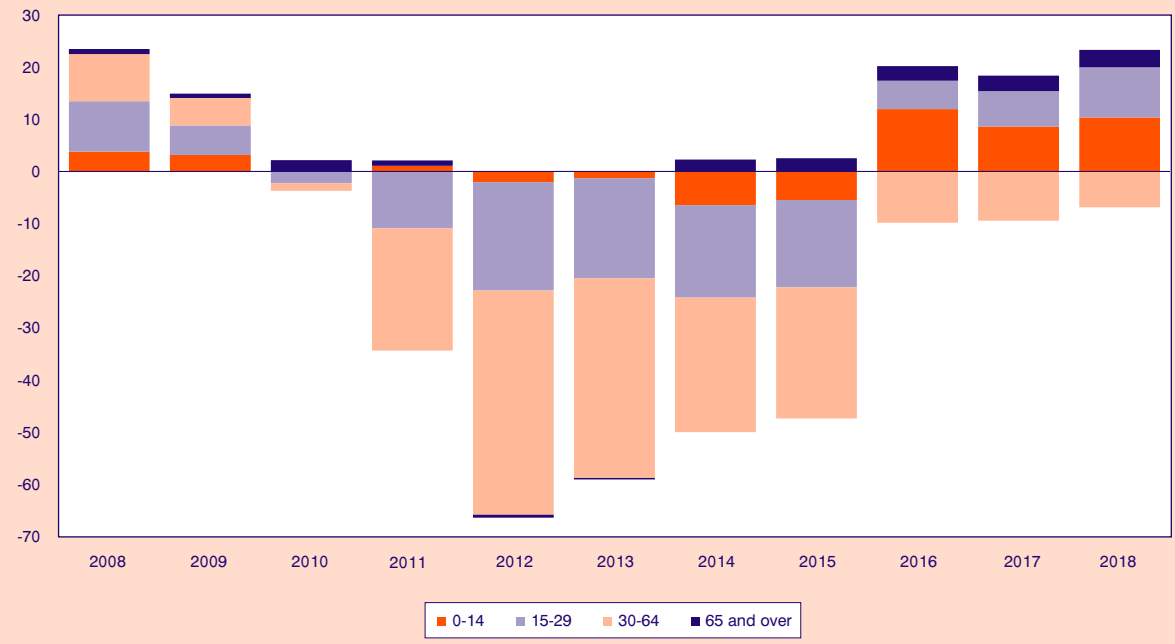
From 2016 onwards, the population data of net migration becomes positive. However, an upsetting parameter, which creates the conditions for further deterioration of the population ageing, concerns the specific age-group balances. Focusing on the developments of the net migration that took place in the period after 2008, it is possible to investigate the age composition of the flows. Figure 3.1.2 depicts the tendency of the population to flee the country. In addition, examining the outgoing and incoming age groups may allow us to differentiate the significance of the overall positive flow that appears from 2016 onwards.

FIGURE 3.1.2
Net migrant flow, thousands of people, 1957-2018, Greece



Source: ELSTAT and own calculations.

FIGURE 3.1.3
Net migration flows per age group, thousands of people, 2008-2018, Greece



Source: ELSTAT and own calculations.

In that respect, Figure 3.1.3 shows the net migration of some broad age groups from 2008 to 2018. During the period 2010 to 2015, while the net migration flow result is negative, the age group of 65 years and over is positive, indicating that this age group keeps entering the country. This trend does not stop even during the period 2016 to 2018. On the contrary, during the years of recession, young age groups, and especially the productive age of 30 to 64, are flowing out of the country. The trend is only partially reversed from 2016 onwards when the flow of the productive age group (30 to 64 years old) continues to be negative.

3.1.4. Conclusions

The long-term unfavorable demographic developments of the Greek population reflect the main trends of the rest of the EU countries. However, our country shows a strong indication that population ageing will continue to exist and even intensify. The combination of declining birth rates and migratory outflows of the productive ages shapes the complexity of the demographic context and calls for a mix of policy interventions to address social security and immigration issues (e.g., promoting effective integration of migrants and refugees).

4. Reforms-Economic development

KEPE, *Greek Economic Outlook,* issue 43, 2020, pp. 54-57

4.1. Greek Justice needs urgent reforms

Athanasios Chymis

"To delay Justice is Injustice"
William Penn

Studying the history of humanity, the first concept that emerges and is the basic condition for the formation of human societies is the concept of Justice. As early as the 6th century B.C., Chilon of Sparta (Aristotle and other philosophers later) said that "the best state is one where the laws and not the politicians are obeyed."[1] Many centuries later the quote was one of the main ideas of the Enlightenment, while today hardly anyone disagrees with Freud's aphorism "the first requisite of civilization is that of justice."[2]

It is almost unanimously agreed that a good level of justice is a basic condition behind any country's socioeconomic wellbeing (World Justice Project, 2020). Consequently, most, if not all, international organizations that study and rank countries based on series of socio-economic indexes include indicators that refer to the justice system of each country. Justice is a basic factor for improving the competitiveness of an economy through enhancing the business climate and increasing citizens' (consumers' and entrepreneurs') trust toward the government and institutions (OECD, 2019).

The most thorough report on justice at a global level is by the World Justice Project (WJP), "an independent, multidisciplinary organization working to advance the rule of law worldwide."[3] It was founded in 2006 and publishes the Rule of Law Index every year. According to the WJP, a healthy justice system has four universal principles: a) everyone (private actors as well as the government) is accountable under the law; b) the laws are clear publicized, stable and just; applied evenly; and protect fundamental rights, the security of persons, contract and property rights as well as certain core human rights; c) the processes by which the laws are enacted, administered, and enforced are accessible, fair, and efficient; and d) justice is timely delivered by competent, ethical, and independent representatives (WJP, 2020; OECD, 2019).

The WJP Rule of Law Index is composed of eight factors: constrains on government powers, absence of corruption, open government, fundamental rights, order and security, regulatory enforcement, civil justice, and criminal justice. The 2020 edition's data come from 500 variables through questionnaires administered to over 130,000 households and 4,000 legal experts from 128 countries. Greece scores 0.61 (on a scale between 0-1) and ranks 40th. To put this in perspective, Denmark (1st) scores 0.90 and Venezuela (128th) scores 0.27.

According to the WJP, the concept of justice captures the whole socioeconomic life of the citizen as a producer, consumer, entrepreneur, constituent, employee, etc. This short article focuses on the basic indicators of the justice system, such as the degree of independence and efficiency, as well as on justice indicators that concern the business climate, such as insolvency resolution and contract enforcement.

The Global Competitiveness Index (GCI) of the World Economic Forum (WEF) includes Institutions as one of the 12 Pillars that compose the Index. Institutions include indicators that are related to the operation of the justice system as Table 4.1.1 illustrates. Table 4.1.1 compares Greece with five economies, four of which had a similar economic crises and went through similar supervision mechanisms (Cyprus, Ireland, Portugal and Spain), and Estonia, a country that became a member of the European Union (EU) in 2004, that is, 23 years after Greece became member of the EU. Estonia was a poor country of the former iron curtain with a per capita

1. <https://best-quotations.com/authquotes.php?auth=1045>.
2. <https://www.brainyquote.com/quotes/sigmund_freud_400976>.
3. <https://worldjusticeproject.org/>.

TABLE 4.1.1 Rankings of selected economies on indexes of the judicial system based on GCI (141 economies total)

Index / Country	Greece	Estonia	Ireland	Spain	Cyprus	Portugal
Judicial Independence	83	22	13	54	40	43
Efficiency of the legal system on challenging regulation	118	35	41	74	44	83
Efficiency of the legal system on settling disputes	131	40	48	63	87	113
Adaptability of the legal system on digital business models	122	6	36	64	70	58
Property rights	97	28	14	47	41	44
Intellectual property protection	80	26	15	37	36	32

Source: World Economic Forum, *Global Competitiveness Report 2019* (2018 data).

national income at 36% of the Greek per capita national income in 2003. Following a path of reforms that completely transformed its economy, Estonia's per capita income surpassed Greece's in 2018. The reader should keep in mind that the data of Table 4.1.1 come from the Executive Opinion Survey the GCI uses every year. The indicators show that Greece needs to prioritize reforms regarding the efficiency of the judicial system.

A commonly used index almost unanimously accepted by practitioners is the Ease of Doing Business Index (DB) constructed by the World Bank (WB). It is composed of ten sub-indexes, two of which are closely related to legal issues, such as the ability of the state to enforce contracts and to resolve insolvency. The enforcing contracts indicator "measures the time and the cost for resolving a commercial dispute through a local first-instance court, and the quality of judicial processes index, evaluating whether each economy has adopted a series of good practices that promote quality and efficiency in the court system" (DB 2020 Greece, p:52). Data are collected through the study of the codes of civil procedure and other court regulations as well as questionnaires completed by local litigation lawyers and judges.

Regarding the resolving insolvency indicator, DB measures "the time, cost and outcome of insolvency proceedings involving domestic legal entities" and calculates "the recovery rate which is recorded as cents on the dollar recovered by secured creditors through reorganization, liquidation or debt enforcement (foreclosure or receivership) proceedings" (DB 2020 Greece, p:58). Data are derived from questionnaire responses by local insolvency practitioners and verified through a study of laws and regulations as well as public information on insolvency systems. Table 4.1.2 compares Greece's performance to the aforementioned five countries. The need for urgent reforms becomes clear. Specifically, Greece needs to speed up judicial processes and improve the recovery rate of insolvencies.

The European Commission (EC) started, in 2013, to publish the EU Justice Scoreboard. Its purpose is to provide comparable data on the independence, quality, and efficiency of national justice systems as well as the implementation of suggested reforms. It is an information tool that helps member states achieve more effective justice through the recommended reforms. The scoreboard focuses on civil, commercial and administrative cases as they directly affect the business and investing environment.[4]

The Council of Europe (CoE) puts great emphasis on the rule of law and the smooth functioning of justice; thus, in 2002, it established a special Commission, the Council of Europe Commission for the Efficiency of Justice (CEPEJ),[5] which collects data related to national justice systems for 47 countries (i.e., not only for the 28 member states). The CEPEJ collects detailed

4. <https://ec.europa.eu/info/policies/justice-and-fundamental-rights/upholding-rule-law/eu-justice-scoreboard_en>.

5. <https://www.coe.int/en/web/cepej>.

TABLE 4.1.2 Selected economies' rankings based on the DB index (190 countries in total)

Index / Country	Greece	Estonia	Ireland	Spain	Cyprus	Portugal
Enforcing contracts	**146**	**8**	**91**	**26**	**142**	**38**
Time (days)	1,711	455	650	510	1,100	755
Cost (% of claim value)	22.4	17.3	26.9	17.2	16.4	17.2
Quality of judicial process index (0-18)	12.5	13.5	8.5	11.5	8.0	13.5
Resolving Insolvency	**72**	**54**	**19**	**18**	**31**	**15**
Recovery rate (cents on the dollar)	32.0	36.1	86.1	77.5	73.8	64.8
Time (years)	3.5	3.0	0.4	1.5	1.5	3.0
Strength of insolvency framework index (0-16)	11.5	13.0	10.5	12.0	10.5	14.5

Source: World Bank, *Doing Business 2020* (2018 data).

data on a plethora of variables, such as the national budget for justice, gender equality of the legal system, lawyers, court organization, time to resolve a case, degree of judicial independence, use of digital technology, etc. The last report's (2018) data refer to 2016. The forthcoming report (2020) contains data referring to 2018. Table 4.1.3 comparatively illustrates some basic characteristics of the Greek justice system.

According to the CEPEJ report (2018), Greece and Cyprus have been improving the clearance rate of first instance cases since 2010. However, the clearance rate for second and highest instance cases raises concern. The report notes that the small number of non-judge staff burdens judges with unnecessary bureaucratic procedures, which distracts them from their main work. There is also significant room for improvement with respect to the use of information and communication technology (ICT) by the Greek justice system.

In a recent report for Greece, the OECD (2020) highlights that although mechanisms of alternative dispute resolution (ADR), namely, extra-judicial and judicial mediation, and judicial arbitration exist in Greece, they are not yet popular due to lack of public awareness and low levels of trust in these mechanisms. Consequently, individuals and businesses prefer to resolve their cases in court, thus overloading the justice system with unnecessary cases that could have been solved easier and faster extra-judicially (OECD, 2020).

Concluding this short presentation of Greek justice, a brief summary follows of the recommendations of the reports from the aforementioned international organizations:

1) Disseminate information regarding the mechanisms of ADR in order to increase public awareness and trust in these mechanisms. More cases resolved extra-judicially means fewer cases through the courts and a higher clearance rate of all cases.

2) Increase the use of digital technologies by the justice system and the adoption of ICT as well as the availability of online information (e-justice).

3) Hire qualified non-judge staff (and train of the existing staff) to do much of the administrative and bureaucratic work so that judges can be focused on their core mission and speed up the whole judicial process.

In a final note, it is important to stress once again the significance of an independent justice system that resolves disputes according to the highest quality standards in a timely manner. Such a justice system permeates the whole society and has a considerable impact on the economy of each country, particularly on the levels of public trust in government and public institutions. The level of public trust in the Greek state (13%) is among the lowest globally and the lowest among the 34 OECD member countries (OECD, 2019). Low levels of trust in the government and its institutions, such as justice, do not contribute to the much-needed friendly business environment and do not enhance tax compliance, which is another thorny issue every Greek government tries to tackle.

TABLE 4.1.3 Basic characteristics and efficiency of Greek justice compared to selected economies according the CEPEJ

Indicator / Country	Greece	Estonia	Ireland	Spain	Cyprus	Portugal
Budget for justice (% GDP)	0.26%	0.27%	0.09%	0.33%	0.29%	0.32%
Judges per 1 million inhabitants	258	176	35	115	131	193
Non-judge staff per judge	1.5	3.8	6.0	9.2	3.9	2.8
Lawyers per 1 million inhabitants	3,903	755	2,618	3,053	4,250	2,956
ICT use index (0-9)	5	8	6	9	4	8
Clearance rate of civil and commercial litigious cases[a]	99%	98%	59%	103%	-	112%
Disposition time of civil and commercial litigious cases (days)[b]	610	139	-	282	-	289
Clearance rate of administrative cases[a]	148%	106%	-	112%	113%	112%
Disposition time of administrative cases (days)[b]	1,086	108	-	312	1,582	143
Clearance rate of second and highest instance[a]	75%	106%	82%	-	98%	97%
Disposition time of second and highest instance[b]	1,149	95	-	-	181	114

Source: CEPEJ, 2018.

a. Number of resolved cases divided by the number of incoming cases expressed in %.
b. It is a theoretical time calculated as the number of pending cases at the end of the observed period divided by the number of resolved cases within the same period multiplied by 365 (days in a year).

- No data available.

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KEPE, *Greek Economic Outlook,* issue 43, 2020, pp. 58-62

4.2. The new bankruptcy law in Greece: An evaluation from the perspective of economic theory and policy

Konstantinos Loizos

4.2.1. Introduction

The global financial crisis of 2007-2009, which turned, in countries such as Greece, into a public debt crisis and a general economic crisis, brought to the fore the issue of tackling bankruptcy and default for both businesses and households. The aspects of this phenomenon are multifold, as they concern and adversely affect all those involved in a loan relationship: banks, businesses and households. Consequently, they affect the Greek economy as a whole and its prospects. The issue of dealing with both entrepreneurial failure leading to default on business loans and the inability to repay consumer and mortgage loans by households has become more urgent in the new adverse economic situation due to the COVID-19 pandemic and its upcoming new wave expected for the fall.

This article presents a first assessment of the possible effects and obstacles of the approach introduced by the Draft Law on the new bankruptcy framework,[1] which was put to public consultation on August 27, 2020. Section 4.2.2 analyzes the main views governing the literature on the issue of the bankruptcy framework. Section 4.2.3 presents the European guidelines and the innovative provisions introduced by the new Greek bankruptcy law. Finally, in Section 4.2.4, we come to some key conclusions and identify potential obstacles to the success of the new framework.

4.2.2. Bankruptcy law in the economic literature

The issues that are examined in the international literature in the field of economics concerning bankruptcy law include 1) the justification, from the point of view of economic theory, of the different legal frameworks of bankruptcy as well as the related reforms (Cirmizi, Klapper & Uttamchandani, 2010; White, 2007; Li & Sarte, 2006; Athreya, 2005); 2) the relationship between the bankruptcy legal framework and the conditions in the mortgage and consumer loan markets, the social consequences of real estate foreclosures, the stigma of bankruptcy and the possible incentives that lead to behaviors that are conducive to strategic bankruptcy (Bauchet & Evans, 2019; Carroll & Li, 2011; Li, 2009; Lee, Peng & Barney, 2007; Fisher, Filer & Lyons, 2004; Fay, Hurst & White, 2002; Domowitz & Sartain, 1999; White, 1998; Fay, Hurst & White, 1998); 3) the potential benefits and costs of amending bankruptcy law in favor of a second-chance policy for bankrupt entrepreneurs (Mankart & Rodano, 2015; Fossen & König, 2015; Fossen, 2014; Cumming, 2012; Lee, Yamakawa, Peng & Barney, 2011; Primo & Green, 2011; Armour & Cumming, 2008; Ayotte, 2006).

The literature distinguishes between the corporate bankruptcy process, which concerns large and medium-sized enterprises, and personal bankruptcy, which refers to the bankruptcy of households and small businesses. After all, small businesses are usually in the form of a sole proprietorship or a partnership in which partners have full or limited responsibility for the debts of their business. In any case, the bankruptcy process is a collective framework for settling outstanding debt, by setting the rules that determine the part of the debtor's assets that will be used to repay their debt as well as the distribution of repayments among creditors. These two depend, in the case of corporate bankruptcy, on whether the assets are liquidated or whether a reorganization of the business is preferred (White, 2007). Ideally, the reorganization of sustainable businesses and the liquidation of non-viable ones is preferred (Cirmizi, Klapper & Uttamchandani, 2010). The particularity of personal bankruptcy lies in the fact that it does not entail the liquidation of all assets of the borrower, for two reasons: Firstly, because the individual's property also includes human capital, which cannot be expropriated. Secondly, because property and income limits are recognized, which are related to a minimum subsistence level for the individual. Finally, the objective of bankruptcy law is threefold: 1) to determine an

1. "Debt Settlement and Second Chance Code", Draft Law, <http://www.opengov.gr/minfin/wp-content/uploads/downloads/2020/08/ΣΧΕΔΙΟ_ΝΟΜΟΥ.pdf> and Explanatory Memorandum <http://www.opengov.gr/minfin/wp-content/uploads/downloads/2020/08/ΑΙΤΙΟΛΟΓΙΚΗ_ΕΚΘΕΣΗ.pdf>.

amount of repayment such that it satisfies the creditors without pushing them to worsen the debtor's terms of refinancing and, at the same time, ensures the viability of the debtor; 2) to protect the debtors from an "aggressive" debt collection policy on behalf of creditors, which could lead to a drastic reduction in the value of debtors' assets and, hence, to a financial catastrophe for their businesses or households (Cirmizi, Klapper & Uttamchandani, 2010; White, 2007). 3) In particular, the personal bankruptcy procedure also aims at providing partial security against uninsurable risks, regarding a minimum level of household consumption, which can be secured by partial or total debt relief, if this is necessary. Having said that, we should always keep in mind the moral hazard issue that lurks in such situations, along with the high socioeconomic costs of eliminating the option of bankruptcy (White, 2007; Li & Sarte, 2006; Athreya, 2005). However, a complete picture of bankruptcy law can only be obtained if it is embeded in the overall institutional set of formal and informal rules that determine the content of bankruptcy laws, the structure of financial markets and society's perceptions of personal ethics and the stigma of bankruptcy (Cirmizi, Klapper & Uttamchandani, 2010).

Particular attention has been paid in the literature to the possibility of a strategic household default, which is considered to increase as the financial benefit for the debtor increases (the amount of debt exempt minus the value of assets not excluded from bankruptcy assets). In addition, the likelihood of bankruptcy is affected by bankruptcy rates in the geographic area where the debtor lives (Fay, Hurst & White, 2002).

On the other hand, it has been observed that not all households that would benefit from filing for bankruptcy do so. The reasons are twofold: either these households are not officially declared bankrupt because their creditors do not take legal action against them, or because the implied future bankruptcy option is of higher value to some debtors who are reluctant to "redeem" it now (White, 1998). Of course, the choice of bankruptcy depends on a number of other factors such as marital status, age, level of education, professional status, the health status of household members in combination with the existence of adequate insurance coverage, home ownership, the level of household debt as well as the types of debt and, of course, the macroeconomic environment (Domowitz & Sartain, 1999; Bauchet & Evans, 2019). Additionally, the bankruptcy process is not always considered beneficial to the extent that as a debtor continues to stay in the mortgaged home, the damage to the property increases and its value is reduced while, at the same time, a significant percentage of debtors do not eventually avoid foreclosure, as the US experience has shown (Carroll & Li, 2011; Li, 2009).

The stigma of bankruptcy is of particular importance as a factor against declaring default. The probability of filing for bankruptcy increases as the social stigma decreases, as well as in the cases in which the personal stigma is lower than the average in a given category of debtors (Fay, Hurst & White, 1998). However, the stigma of bankruptcy is not the same everywhere. Cultural differences between countries lead to varying degrees of stigma and tolerance in various societies that treat entrepreneurship and failure differently. In addition, the stigma may differ in different industries in the same country. For example, in the high-tech industry, which is characterized by high uncertainty, the stigma of failure is milder than in other industries (Lee, Peng & Barney, 2007). However, in most cases, bankruptcy has adverse effects on debtors since it is a negative feature of their credit history that accompanies them throughout their life with the consequence of limited access to finance. It is notable that this effect is closely related to the perceptions prevailing not in society in general, but in financial institutions in particular (Fisher, Filer & Lyons, 2004).

The fact that bankruptcy can be considered as a safeguard for the debtor does not only concern households, but also small entrepreneurs who participate in the liability of their businesses to creditors with all their property (Fossen & König, 2015). In this case, the safeguard becomes a "second chance" for entrepreneurs who are able to preserve part of their assets (depending on the levels of exemptions from bankruptcy assets) in order to finance a new start (Mankart & Rodano, 2015). To the extent that this positive effect outweighs the negative effects of bankruptcy (such as higher borrowing costs), then the less affluent entrepreneurs benefit and therefore the bankruptcy framework increases the incentives for entrepreneurship in the less favored sections of the population (Fossen, 2013). Finally, a more lenient and entrepreneurial-friendly bankruptcy law contributes to the development of businesses, especially those seeking to put forward and implement high-yield and therefore high-risk investment plans (Cumming, 2012; Lee, Yamakawa, Peng & Barney, 2011). This is important insofar as "business policy" has been considered one of the critical axes of economic policy in recent years in developed economies, especially with regard to the "second chance" for small businesses (Armor, 2008; Ayotte, 2006). However, a more lenient bankruptcy framework can contribute more to the development of replicative entrepreneurship than to

the flourishing of innovative entrepreneurship (Primo & Green, 2011).

In short, an efficient bankruptcy framework must be able to operate in conditions of uncertainty that affect the value of assets, including human capital, under given social perceptions for entrepreneurship and failure, and with a view to balancing the different incentives of debtors and creditors for the benefit of the economy as a whole.

4.2.3. The European framework and the new Greek bankruptcy law

European Directive 1023/2019 establishes a framework for preventive restructuring and debt relief. Its target group consists of viable businesses and honest, but highly indebted, entrepreneurs who are seeking a second chance to continue their business for the benefit of themselves, their creditors and the economy as a whole. Also, precautionary restructuring is expected to reduce the likelihood of new non-performing loans for sustainable businesses, while non-viable businesses should be liquidated as soon as possible to avoid adverse effects on the economy. In addition, time-consuming procedures, according to the Directive, are accompanied by higher costs for the parties involved, and should therefore be avoided. At the same time, increasing the efficiency of the restructuring process and of the insolvency and debt relief framework would lead to the optimization of risk assessment and the related minimization of socio-economic costs.

In the context of the above European Directive, the main goal of the new Greek bankruptcy law is to establish a comprehensive framework for dealing with debts that drive a business or a household into default. The idea is to provide to both a conditional second chance to participate again in economic life while being discharged from existing debts.

One might say that the provisions of the Draft Law focus on two main aspects of the bankruptcy problem: the acceleration and the simplification of the procedures. The time factor is important because delays in proceedings are burdensome for all parties: both creditors and debtors. From this point of view, the key parameter is the impairment of the productive value of the assets involved in the bankruptcy process. The chances of assets' value depreciation increase as the time to complete the bankruptcy process is extended. On the other hand, a shorter and more orderly settlement would benefit those involved, as well as the economy, to the extent that capital resources would promptly rejoin the production process, thus contributing to the country's economic recovery. In addition, the homogenization of the bankruptcy regime to include both businesses and households, as well as its digitization/simplification, would help provide a second chance for the affected debtors. At the same time, it would strengthen the creditors' safeguards against strategic defaulters to the degree that homogenization and digitization would improve the system's transparency. Providing a second chance would pave the way for overcoming the stigma of bankruptcy that has hitherto plagued the business world and has been a deterrent to taking innovative business initiatives that inevitably involve a high risk of bankruptcy. Furthermore, the over-indebtedness of businesses and households has become a time bomb in the foundations of the economy, while the homogenization of the bankruptcy framework provides an answer to the often vague distinction between business, consumer or other types of debts.

The important provisions of the new bankruptcy law, as set out in Table 4.2.1, are embedded in the above context.

4.2.4. Discussion and conclusions

Given the international literature mentioned above and the Greek reality, one can argue with confidence that the initiative to revamp the country's bankruptcy law was necessary and imperative. Both the new conditions brought about by the successive economic crises of the last decade and the inherent weaknesses of the Greek framework, in combination with the developments at the international level, contributed to this decision. The complexity and maze of legislation in this area did not facilitate the rapid and transparent completion of the relevant procedures, while, at the same time, it gave the opportunity to strategic defaulters to take advantage of it.

In addition to the necessary modernization and specialization for cases such as bona fide debtors belonging to vulnerable groups, there was an urgent need to deal quickly with over-indebtedness, which stifles the economy and often takes the form of non-performing loans. The longer these problems persist, the greater the uncertainty, the larger the devaluation of assets and the more severe the immobilization of banks' balance sheets from non-performing debts becomes, draining the economy from new credit. Therefore, for all the above reasons, the Draft Law is heading towards the direction of restarting the economy in order to limit the spread of moral hazard, minimize the social impact and to maximize the benefits for the economy as a whole.

In the context of the previous analysis, however, we must point out three factors that demand the attention

TABLE 4.2.1 The innovations of the New Bankruptcy Framework

Innovations of the New Bankruptcy Law	Justification
The out-of-court mechanism for debt restructuring, for both firms and households	This mechanism would enable the formulation of restructuring proposals through an automated confidential process that would include financial institutions, the State and Social Security Institutions. It is believed that it would contribute to the simplification and acceleration of the processes, especially benefiting the very small and small businesses as well as individuals. The aim here is *prevention*, i.e., intervention at an early stage during which the debtor has not yet become insolvent.
The preventive reorganization framework	It mainly concerns large companies, but also other debtors in cases where radical interventions are required to avoid bankruptcy. Accelerating and simplifying procedures for a new beginning in the business arena combined with securing and protecting the various stakeholders, including employees of the consolidating companies, are at the heart of these arrangements.
Early warning mechanism	The establishment of mechanisms that provide the debtor with early warning in cases where he/she may be in a state of insolvency, so that he/she can act immediately to prevent possible bankruptcy. In addition to establishing of borrower service centers and offices, setting up electronic warning mechanisms is envisaged, as well as activating professional chambers and organizations in this direction.
Providing a second chance to the bona fide debtor	It has the meaning of debt relief after the liquidation of a debtor's property. Also, the individual debtor does not lose his license to practice due to the declaration of bankruptcy, so that it is possible for him to rejoin the production process and recreate his/her property for the benefit of himself and of the economy. After all, the deprivation of the license to practice usually led the former debtor to the informal economy, with the negative consequences that this entailed for public finances and the allocation of productive resources.
The special provisions for vulnerable groups of the population	Vulnerable groups who lose their first residence due to bankruptcy will be able to remain in it as tenants, receive a rent subsidy and regain it under certain conditions. The Acquisition and Re-Leasing Agency is a private legal entity based on a concession contract from the State.
The Electronic Solvency Register and solvency managers	All decisions and acts of the bankruptcy process will be registered in the Electronic Solvency Register in order to facilitate information diffusion to all interested parties as well as to ensure transparency, publicity and the evaluation of the relevant procedures. In addition, the responsibilities and qualifications for the appointment of insolvency administrators are described.

of policy makers, insofar as they relate to overcoming potential obstacles in order to achieve government policy objectives:

1) *The human factor:* The automation-standardization of the out-of-court mechanism has the presumption of objectivity but, at the same time, bears the risk of inefficiency. This might happen because the lack of the human factor is likely to produce results that will not take into account the specificity of each case in order to maximize the expected result under the given specific constraints.

2) *The value of the assets:* The crucial parameter, both in the bankruptcy process and in the liquidation of the assets, is the preservation of the value of these assets so that they do not fall far below their fundamental value. This principle is in the spirit of the provisions. However, securing this principle presupposes a more general set of institutional solutions that would include the comprehensive treatment of the issue of non-performing loans.

3) *The change in the way of thinking:* In the medium term, the key factor is the change in the way of thinking of economic agents, as this is reflected in their daily behavior. A legislative framework can become a tool to promote economic growth only when it is able to mobilize economic agents in the desired direction. To do this, it must also be able to respond to lingering economic problems that require a solution with mechanisms that are understood by the general public, who incorporate these into their daily practice and adapt their behavior accordingly. To do this, however, the public should be in a position to understand that past ways of thinking are outdated and voluntarily seek to replace them with new ones, to the extent that these are deemed more beneficial. Such attitudes, which stem from established ways of thinking and receive the attention of the policy maker, are the recourse to the informal economy, the distrust in the public sector and the financial system, and a distorted perception of entrepreneurship by some fraction of the society.

Finally, a well-designed bankruptcy framework is one that lays the conditions so that both the remaining capital and the skills of failed entrepreneurs are not lost to the economy, but are returned to it in order to contribute to future economic growth (Eklund, Levratto & Ramello, 2020).

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4.3. Suggestions to mitigate the spread of COVID-19: A behavioural approach

Fotini Economou

4.3.1. Introduction: The problem and the need for an alternative approach to limit the spread of COVID-19

Under the unprecedented conditions resulting from the outbreak of the coronavirus pandemic (COVID-19), policy makers are confronted with a crisis that evolved on multiple levels: healthcare, economic, social. In the case of Greece, it turned out that there was a rapid response that led to the effective management of the first wave of the pandemic in the country. Taking strict measures in conjunction with comprehensive public information, with emphasis on scientific data, seems to have paid off. Nevertheless, the gradual lifting of the restrictive measures and the opening up of the economy seem to have relaxed the behaviour of some people. A crucial question today is how to achieve a shift in the behaviour of the citizens who do not take or improperly take precautionary measures to mitigate the spread of COVID-19, in order to protect public health and reduce the financial and social consequences.

The central role of human behaviour and psychology in the decision-making process is emerging, more than ever before. In recent years, the interest of researchers, as well as policy makers, internationally, has increasingly focused on the use of behavioural insights as a useful tool to enhance the effectiveness of policy making and the implementation of policy measures in various areas, such as taxation, consumer protection, health, energy savings, etc. (see Economou, 2018).

Thaler[1] and Sunstein's (2008) book titled *Nudge: Improving Decisions about Health, Wealth, and Happiness* highlighted the concept of nudge and is considered to have inspired the creation of specialised units, called "nudge units", in public and private organizations internationally. Nudges refer to simple and easy interventions that can motivate behaviours and decisions without restricting individuals' personal freedom or imposing prohibitions and orders. In this context, the creation of specialized groups is observed both in international organizations (e.g., the OECD, European Commission, United Nations, World Bank) and in the governments of several countries (e.g., the United Kingdom, the USA, Australia, Canada, etc.). In addition, even when a specialized group does not exist in the public administration, there are still cases of behavioural insights being used.

This article presents an alternative approach to mitigate the pandemic, which can complement and support the policy measures already adopted, given the recent health-related developments in Greece. Section 4.3.2, identifies behavioural biases related to the spread and the prevention of COVID-19 in order to address them. Section 4.3.3, presents a behavioural tool developed to contribute to the understanding of citizens' behaviour. Section 4.3.4 discusses the need to change human behaviour in order to deal with the pandemic, giving some general advice. Section 4.3.5 presents the danger of fake news and misinformation, while the last section concludes and provides suggestions for the case of Greece.

4.3.2. A behavioural approach

Individuals seem to be predictably irrational (Ariely, 2008). This implies that instructions, advice and rules are not enough to make their behaviour change and ensure public health. Researchers try to help policy makers better understand human behavior and identify the behavioural biases observed in the decision-making process that should be addressed to safeguard public health.

To begin with, excessive/unrealistic optimism (**optimism bias**) is quite common and refers to the belief that negative events (e.g., serious illnesses, accidents, etc.) are less likely to happen to us compared to others (Weinstein and Klein, 1996). According to a recent study by Dryhurst et al. (2020), risk perception is associated with the adoption of precautionary measures against COVID-19. Therefore, people's over-optimism can lead them to underestimate the risk and the likelihood to get sick themselves, thus not take the necessary protective measures. The fact that the disease usually (though not always) manifests itself with mild

1. Professor Richard Thaler was awarded the 2017 Nobel Prize in Economics for his contribution to Behavioral Economics.

symptoms or no symptoms in people of a younger age could further strengthen this belief and the respective behaviour of younger people, with negative consequences for themselves and the society. According to Bavel et al. (2020), the adopted communication strategies should reduce excessive optimism, without causing fear and anxiety. For example, according to Soofi et al. (2020), adolescents may follow COVID-19 prevention measures if they learn that a famous adolescent was infected, as this increases their awareness of their own personal risk.

Moreover, when individuals need to make decisions that involve costs and benefits at different times and there is a choice between present and future results, there is the **present bias**, i.e., placing more emphasis on the immediate results compared to the future ones. A typical example in the field of health is smoking: although smokers are aware of the long-term negative effects of smoking on their health, they place more emphasis on the pleasure of smoking today due to hyperbolic discounting of future costs and lack of self-control (Gruber, 2002; Cherukupalli, 2010). Similarly, in the case of COVID-19, some people, despite being aware of the risk, choose the immediate benefits/pleasure of not following certain restrictive safety measures (e.g., meeting with a large group of friends indoors) and underestimate future costs. According to Soofi et al. (2020), providing an immediate benefit could increase compliance with a precautionary measure (e.g., providing free internet at home to adopt the recommendation to stay at home as long as possible).

Attention should also be placed on the communication strategy to avoid achieving the opposite of expected results. For example, according to Bavel et al. (2020), the term "physical distance" is preferable to the term "social distance", as it may imply that we are deprived of significant social interactions, which are possible even at physical distance. **Framing** is important for the effectiveness of the message, which can be expressed either in a positive (focusing on the benefits of a specific behaviour) or a negative way (focusing on the negative effects of not adopting a specific behaviour). According to Gallagher and Updegraff (2012), positive messages appear to be more effective in promoting preventive behaviour, and Soofi et al. (2020) suggest the use of positive messages to mitigate the spread of COVID-19, i.e., messages that highlight the positive effects that the adoption of preventative measures will have on health. At the same time, even if some people have low risk perception due to excessive optimism, messages focusing on the effects of not taking any precautionary measures to the other members of their family and the community may lead to greater compliance than those related exclusively to their own risk.[2] For example, the message "do not be responsible for the next COVID-19 case" and the respective video addressed to young people were in this spirit.

In general, changing a habit, a behaviour or an attitude can be extremely difficult, with the individual reacting to anything that may cause **cognitive dissonance** (see Festinger, 1957), i.e., to anything that is different from what is already known. A common reaction mechanism is selective perception, i.e., the tendency to retain only the information (reliable or not) that confirms previous choice or decisions (**confirmation bias**) or to justify decisions considering them as some special case or an exception.[3] In this sense, special attention is needed so as not to share contradictory messages, as individuals experience cognitive dissonance and may not adopt the appropriate behaviour. For example, conflicting/different messages from the World Health Organization (WHO) about the effectiveness of using a protective mask by healthy individuals could confuse and/or discourage mask wearing.[4] This could also cause **anchoring** to the original announcement and selective recall of information that confirms it, despite the change in healthcare data that necessitates mask wearing by everyone.

In addition, the impact of the **affect heuristic** in the way individuals assess risk and potential benefits should not be overlooked, as different emotions lead to different perceptions of risk and expected benefits (Finucane et al., 2000). More specifically, a positive emotion about a behaviour or an activity results in individuals perceiving less risk and greater benefits and vice versa, while a negative emotion results in individuals perceiving greater risk and lower benefits (Slovic and Peters, 2006). This finding should be taken into consideration when communicating messages regarding COVID-19 restrictive measures. For example, a negative feeling about not taking precautionary measures can increase the perceived risk and reduce the expected "benefits" of not following the rules; vice versa, a message that creates a positive feeling about

2. Recent studies (preprints) indicate the effectiveness of the messages that refer to the impact of the spread of COVID-19 on family and community members and not on the individuals themselves (see, for example, Capraro and Barcelo, 2020).

3. See Pompian (2006).

4. See the WHO recommendations regarding the use of protective masks of April 6th 2020 and June 5th 2020.

a behaviour (e.g., the opportunity for the whole family to stay together at home) could encourage individuals to follow the recommendation to stay at home (Soofi et al., 2020).

Finally, special emphasis should be placed on herd behaviour. This behaviour is documented in many scientific fields (such as sociology, psychology, economics, finance) and demonstrates the power of social norms and social interaction. Although there is no commonly used definition, herd behaviour refers to imitation, often overlooking personal knowledge or information. According to Raafat et al. (2009), it is "a form of convergent social behaviour" without any centralized coordination. Therefore, when individuals observe others' positive or negative behaviour, they are likely to adopt similar behaviour. Under these circumstances, one way to encourage the implementation of measures that may mitigate the spread of COVID-19 is to refer to a positive behaviour adopted by the majority (e.g., the majority of the local community keeps physical distance) (Soofi et al., 2020). In this context, it is advisable to emphasize collective action, taking into account the fact that some individuals are "conditional co-operators", i.e., they are willing to make some personal "sacrifice" for the common good given that others do the same, but they will not cooperate if the majority is not interested (Chaudhuri, 2011). Clear communication employing influential leading personalities,[5] the feeling that individuals belong to a group and the existence of punishment for non-compliance (not only financial or material, but also in the form of polite social disapproval, see Masclet et al., 2003) may facilitate collective action (see Lunn et al., 2020), which is absolutely necessary in the current phase of the pandemic.

4.3.3. The World Health Organization adopts a behavioural approach

The growing importance of understanding human behaviour for effective policy-making regarding COVID-19 is highlighted by the official statement of WHO Europe, according to which behavioural insights provide valuable input in the process of planning effective measures against the pandemic.[6] In this context, WHO/Europe designed a behavioural tool[7] for conducting regular surveys to assist the authorities in developing and coordinating COVID-19 policies and messages, to understand the level of public confidence, risk perception and possible obstacles in the implementation of the proposed actions. According to WHO/Europe, understanding these parameters is critical for the successful implementation of measures and effective communication to deal with the pandemic.

The *COVID-19 Snapshot Monitoring* (COSMO) initiative was launched in Germany by conducting weekly online surveys of a representative sample of citizens from early March 2020. In this context, WHO/Europe developed a behavioural tool in collaboration with the University of Erfurt (Germany) and the COSMO group consortium and supports the countries that want to implement it. The tool is available to everyone and provides the relevant questionnaire (which can be modified to suit each country) and detailed instructions on the method of analysis and results presentation. The participation of all stakeholders in all stages is also considered valuable. Research should be repeated periodically, and the findings should be used to properly adapt both the policies adopted and the respective messages to citizens.

Understanding citizens' behaviour is the first and most important step in developing an effective COVID-19 response, as behaviour is the most important weapon we currently have at our disposal until an effective vaccine is developed. For example, identifying groups of citizens (not only age groups, but also professional, geographic, etc.) who have low risk perception could help authorities create an appropriate communication strategy by adapting the messages to make people understand the problem and increase the likelihood of successfully implementing protective measures. In addition, early detection of a reversal in citizens' be-

5. In each group (age, social, professional), different people could have a substantial impact. For example, in addition to political leadership and specialized scientists, religious leaders, celebrities, athletes, singers, actors (different by age group), national or local professional associations' or unions' representatives, etc., men or women, could have a significant impact on different groups of people. According to Courtenay et al. (2002), men adopt riskier health behaviours and beliefs than women. For example, according to a study conducted by Lee et al. (2020) in 1,500 adults in Hong Kong during the period Jan.-Feb. 2017 (in a non-epidemic period), men were less likely to use a face mask than women (in five different circumstances). According to the authors, this behaviour could be attributed to beliefs associated with masculinity and the perception of being strong with lower probability to get sick. In this case, a stereotype should be addressed using, for example, influential leading male personalities (or groups) to communicate the message of mask-wearing. Such differences should be considered to create effective communication strategies in different countries.

6. See WHO Statement, 14/5/2020.

7. See WHO Statement, 6/4/2020 and WHO tool for behavioural insights on COVID-19.

haviour provides useful knowledge (in case of a positive reversal) or messages of vigilance and the need to adjust the measures adopted as soon as possible (in case of a negative reversal), before the results of this reversal are reflected in the epidemiological data.

4.3.4. Human behaviour change to deal with the pandemic

The new reality imposed by the spread of COVID-19 has unpleasant psychological as well as practical consequences for individuals. In some cases, this may result in denial as a defense mechanism and a means to avoid any cognitive disagreement and behaviour change. At this stage, however, denial can be disastrous. For example, despite the scientific information, the overwhelming data and the unpleasant pictures from all over the world, some people still consider COVID-19 to be less dangerous or even non-existent and do not take the necessary precautions. This behaviour usually occurs as a result of over-optimism and confirmation bias (as presented above).

According to the National Academies of Sciences, Engineering, and Medicine (NASEM, 2020), there is no strong evidence that scientific information about COVID-19 and its risks is enough to result in a reversal of behaviour or change of habits of specific groups by itself, even if they understand and accept the facts and that they should behave differently. Even though people who feel in danger are more likely to change their behaviour, it is difficult to convince other people that they are in danger and to adopt a new behaviour/habit given their risk perception as well as the effect of emotions and behavioural biases.

To achieve behaviour change and promote new habits regarding the application of precautionary measures, the suggested behaviour should be easy to initiate and repeat, associated with some benefit/reward and, if possible, with an existing habit; if there is conflict with existing habits, it should be supported by information and alternative desirable behaviours that are accurately described (NASEM, 2020). More specifically, some examples are putting hand sanitizer in prominent spots indoors or at the entrance of our house; marking on the floor to facilitate keeping physical distance; keeping masks in the car or near the door of our house to get into the habit of wearing them as we leave and not forgetting about them; using decorated masks that are in fashion or have the logo of a group that could enhance their use in groups of people; providing of masks for free[8] or at low cost that which reduce a practical difficulty for specific groups of people; further encouraging social behaviours/greetings that replace handshakes or hugging; using clear messages or rules, e.g., “Keep a distance of two meters” instead of “keep physical distance”, etc.

Communication is a useful tool to achieve these goals. According to NASEM (2020), messages should have specific characteristics in order to fulfill their purpose. More specifically, clarity and consistency are required to avoid confusion, but also to avoid paying too much attention to divergent behaviours (e.g., presenting pictures of over-crowded squares) and repeating fake news, as they may have the opposite result since some people may decide to follow some kind of “social rule”. In addition, messages should present the existing risk, providing, at the same time, effective solutions without creating a sense of panic and inevitability (e.g., that we will all get stick) because, in this case, people may not adopt the necessary measures. Although fear can mobilize behaviour change, the feeling that risk may be unmanageable develops defense mechanisms (Witte and Allen, 2000). Calling for responsibility in order to protect the society or our family members and achieve a common goal can be effective. At the same time, the messages should be appropriately framed for each target group and be communicated by influential, well-trusted people who are likely to convince that group through the message or their own behaviour. For example, since there is an increase in cases at younger ages due to non-compliance with protection measures (e.g., non-compliance with physical distancing in entertainment venues, having parties in squares, etc.), a message provided by a person they trust or by young people (e.g., a famous artist or athlete loved by young people) who make their behaviour change visible via social media could have the desired effect. Finally, the message should also indicate the social disapproval of the failure to comply with the required measures, but also the social acceptance when the desired behaviour change is observed.

4.3.5. The danger of fake news and misinformation

An issue that calls for special attention is dealing with false news (so-called “fake news”) and misinformation. With the outbreak of the new coronavirus, fake news and conspiracy theories about its origins, treatment and effects also appeared, with internet and social

8. For example, the provision of masks for free to students and teachers lies in this context of facilitating the desired behaviour.

media making it easier than ever to spread these messages. The WHO employs the term "infodemic" to refer to the over-abundance of information (accurate or not) that makes it difficult for individuals to find reliable sources of information and guidance when they need it (WHO, 2020a). Increased and repetitive exposure to false information may affect people as they tend to rely on information that becomes familiar to them (Oxford Analytica, 2020) and therefore easy to recall. In addition, increasing false information reduces people's trust in governments and trusted organizations (Oxford Analytica, 2020). Under these circumstances, the denial of scientific data gets bigger, making it even more difficult to achieve behaviour changes to take protective measures in order to mitigate the spread of COVID-19.

The first step to deal with this problem is to understand how people evaluate information as true or false. According to Schwarz (2015), individuals are more likely to believe information to be true: (a) when it is shared with others and there is social acceptance, (b) when it is supported by sufficient evidence, (c) when it is compatible with previous knowledge and beliefs, (d) when it has a good logical flow and internal consistency, and (e) when the source is considered to be reliable.

On this basis, the communication should focus on the right/true messages and how to make it easier for people to process and recall them, using appropriate means (e.g., social media, news media, etc.). According to Schwarz et al. (2016), cognitive psychology provides some guidelines. More specifically, the researchers point out that repeating false information should be avoided, as repetition increases acceptance, which results in the reproduction of this information to new audiences. Instead, it is advisable to repeat true information, which should be clearly and simply stated, as well as directly accessible to everyone. Using rhymes, pictures or repetitive phrases can help people imagine a situation or recall information. In addition, individuals are more likely to identify misinformation when they know in advance that misinformation actually exists.

Obviously, the problem cannot be eliminated, but it can and should be properly managed.[9] Everyone can contribute to either tackle or extend this problem. According to the WHO (2020b), people should focus on facts and evidence, share and promote only information coming from reliable sources, be careful with false information, and set a good example by pointing out or by correcting false information when they identify it by referring to reliable sources.

4.3.6. Conclusions and suggestions for Greece

Human behaviour is in the spotlight as a necessary element/means to mitigate the spread of COVID-19. The challenge policy-makers have to face is to change human behaviour in order to achieve the highest possible compliance with the necessary COVID-19 protection measures through an interdisciplinary approach. When new rules are confronted with the force of habit and well-established behaviours along with a number of behavioural biases, the job of the authorities is even more difficult and demanding.

This article presents the role of human behaviour in mitigating the spread of the pandemic and depicts specific behavioural biases which are quite common and affect the decision-making process either individually or in combination (with each other or with other behavioural biases). This provides useful information to design an effective pandemic response. Although some of the above findings are already being used domestically and internationally, either intuitively or as a result of a well-designed communication strategy (e.g., regular and scientific information, emphasis on individual responsibility towards society, enhanced team spirit, repetitive messages with information and instructions on COVID-19 prevention measures, etc.), they could be further employed at this stage when personal behaviour (keeping physical distance, wearing a mask, following simple hygiene rules) is crucial to deal with the pandemic.

More specifically, useful conclusions and suggestions emerge from the above analysis for the case of Greece:

- **Targeted communication approach.** According to the WHO (2020c), "the right message at the right time from the right messenger through the right medium can save lives –misinformation or mixed messages can cost lives". Simple, clear, consistent, well-documented, and repetitive messages coming from people who inspire confidence or from people who are appreciated, trusted or admired are more likely to achieve their goal. It would be appropriate to use different messages for different target groups, which will be provided by different messengers depending on the group (age, profession, geography, etc.), using the appropriate means to deliver the message so as to be accessible by the target group (e.g., social media, news media, electronic, telephone or live communication, etc.).

9. In this context, the WHO organized the 1st WHO Infodemiology Conference from 29/6/2020 to 21/7/2020.

- **Emphasis on positive messages and society as a whole**. For example, the message "Be kind" reflects respect for others in a positive way and has been quite effective in the case of New Zealand. The framing of the message is crucial to its effectiveness. In addition, as mentioned above, it would be appropriate to adopt the use of the term "physical distance" instead of the term "social distance", as this may imply that we are deprived of important social interactions, which are possible even when we are at a physical distance.
- **Emphasis on positive emotions.** For example, creating a sense of pride when taking measures to protect family or community members may promote their adoption.
- **Emphasis on positive examples.** Referencing a positive behaviour adopted by the majority can be an example to follow. Reproducing negative examples may have the opposite effect.
- **Facilitate the desired behaviour**. For example, special markers on the floor for keeping physical distance in as many cases as possible (indoors or outdoors), providing masks free of charge or at a low cost, special signage to remind the use of a mask where required and physical distance in as many cases as possible (indoors or outdoors), etc.
- **Systematic monitoring of individuals' perceptions and behaviour through regular surveys.** Given the observed differences in the way individuals perceive things and behave regarding the pandemic, systematic monitoring of individuals' behaviour through the behavioural tool proposed by WHO/Europe could provide early signs of a change in the behaviour of individuals or specific groups, before the results of this shift become evident in the epidemiological data, in order to adopt the most effective targeted approach per group in time.
- **Conducting meetings** (online or live) **to provide information during the course at all educational levels** with the participation of people who manage the pandemic on a daily basis (e.g., doctors, nurses, etc.), as well as young people who have experienced COVID-19. This action could not only help young people better understand the current situation, the real dimension of the problem, but also allow them to communicate themselves with people who experience this situation on a daily basis or who have gotten sick, in order to directly and responsibly answer any questions or doubts they may have and, finally, give the message to their families themselves, as well.

In any case, before the adoption of any proposed measure/message, it is advisable to check in advance the reaction to it in a sample of people, with emphasis on the individuals of the target group to which it is addressed. For example, it makes no sense to test the effectiveness of a new message on a sample of people who already understand and apply all necessary precautionary measures.

In conclusion, note that even though the use of behavioural insights cannot guarantee the desirable results in each country, period, age or other group, it creates the conditions that could give positive results through interventions, with the aim to encourage the desirable behaviour which has a positive impact, using low or even zero cost measures.

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Greek tourism during coronavirus: Estimation of non-residents' travel receipts and the turnover of enterprises in accommodation and food service activities

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Abstract

This article focuses on the Greek tourism industry which, according to the official and published data available so far in the first half of 2020, appears to have been severely affected by the coronavirus pandemic crisis. More specifically, this article uses Consumer Price Index weights to break down the turnover of accommodation and food service activities into two parts: one attributed to international tourism and another attributed to domestic tourism. It also uses data from the planning of airline international passenger seats to estimate non-residents' travel expenditure for 2020 and the year's losses in international receipts, based on three scenarios. The research showed that in the accommodation sector, the largest share (82%) of turnover comes from international tourism, while in the food sector, the largest share (68%) comes from domestic tourism. In addition, non-residents' expenditure is estimated to range between €3.1 billion and €4.1 billion in 2020, with international revenue losses estimated to range between €14.1 and €15.1 billion compared to 2019.

Keywords*: Accommodation and food sector, non-residents' travel receipts, travel expenditure, coronavirus, COVID-19, price indices, weighting factors, Greek economy.*

JEL classification*: E39, Z30, Z32*

Introduction

As we approach the one-year mark of the outbreak of the COVID-19 pandemic, the economic implications for the future are emerging and tend to confirm the most ominous scenarios of the initial forecasts. As expected, tourism, which is an important sector of the Greek economy, has been adversely affected worldwide, since it requires one to travel and associate with people. These are social activities that are at the top of priorities to avoid during a pandemic.

Greece as a country of destination and provision of tourist services has raised significant annual revenues from tourism in the last decade, mainly from international tourism. Although in the first two months of 2020 the data of tourist arrivals and international receipts foretold that this year would be the best one of the last decade, the emergence of the pandemic diminished tourism activity and especially that part coming from abroad. The international traveler now faces the risk of infection, both at the main border points of entry into the country from abroad and at their tourist destination where the concentration of people is high. In addition, the risk of a generalized spread of the virus forces the government to take measures that naturally restrict incoming tourism (such as closing

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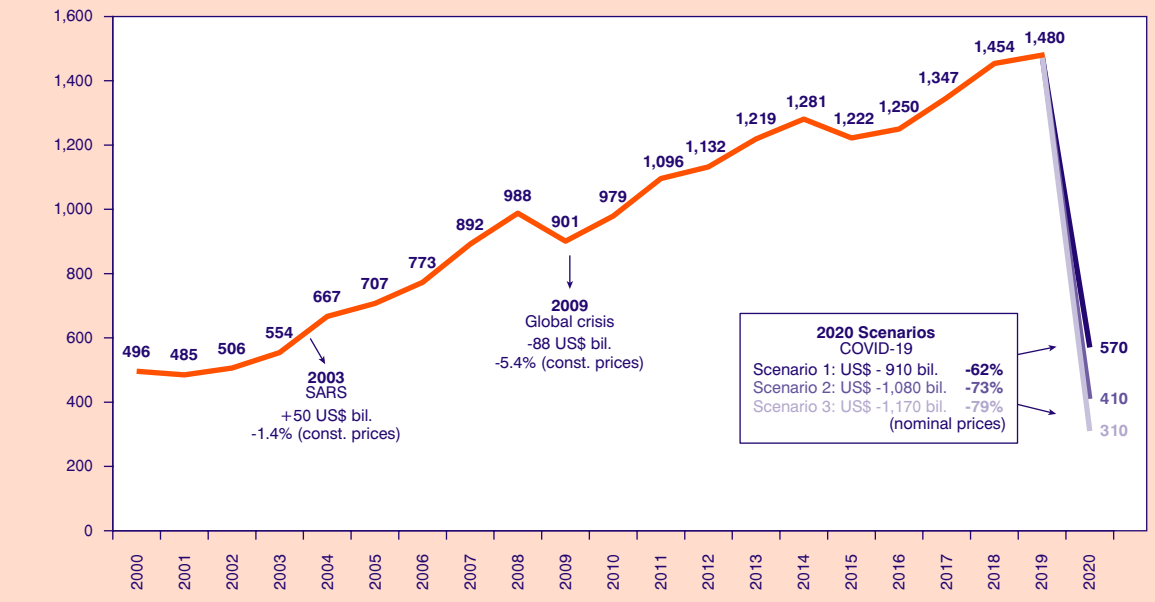
– Opinions or value judgments expressed in this article are the authors' own and do not necessarily reflect those of the Centre of Planning and Economic Research.

CHART 1
International travel receipts, 2000-2019 and scenarios for the year 2020 (US $ bn)



Source: UNWTO (2020).

airports and excluding tourists from countries with a high number of cases).

The negative impact of the pandemic on the economy in general, and also the obstacles it brings to the Greek tourism industry, have been the subject of several academic studies. The contribution of this article to the existing literature is twofold: first, it allocates the turnover of the accommodation and food sectors to external and domestic tourism and then approximates this allocation quantitatively; second, it estimates the non-residents' expenditure for the year 2020 for Greece based on airline passenger seat planning from international flights.

The rest of this article has the following structure. The literature review focuses on recent Greek and international studies that examine the effects of COVID-19 on Greek tourism in particular, but also on the economy in general. The second section uses weights of the Consumer Price Index (CPI) and the Harmonized Index of Consumer Prices (HICP) to break up and estimate the percentage of the turnover in the accommodation and food sectors assigned to international and domestic tourism and how this allocation is affected by the pandemic crisis. The third section presents the travel expenditure of non-residents until June 2020, based on Border Survey data of the Bank of Greece. Then, three scenarios are applied in order to estimate the monthly international travel receipts for the second half of 2020, as well as the total losses in non-residents' expenditure compared to 2019. The last section of the article contains the conclusions of the overall study.

1. Literature review

According to the World Tourism Organization (UNWTO, 2020), the experience of the SARS epidemic in 2003 differs from that of the global financial crisis of 2009 (Chart 1). During the SARS epidemic, international foreign tourist revenue increased by $50 billion worldwide (as the epidemic mainly affected the Asia/Pacific region), but fell by 1.4% at constant prices. The decline in revenues because of the 2009 crisis reached 5.4% (a figure corresponding to US $88 billion loss). However, the impact of the COVID-19 pandemic is expected to be five times that of the 2009 crisis. The UNWTO (2020) estimates that in 2020, the fall in international revenues worldwide will range between 62% and 79% (compared to the pre-pandemic estimate of a 3% to 4% increase), which corresponds to a US $300 – 570 billion decrease in revenues.

OECD studies (2020a; 2020b) estimate that Greece will be more affected compared to other member countries (with a loss of up to 35% of GDP at constant prices). For all OECD countries, the organization estimates that the sectors that will be negatively affected

include transport, tourism, food services, entertainment and retail trade. These sectors contribute to the production of GDP by about 30%-40%. In addition, the OECD (2020a) states that for each month, the lockdown is imposed, GDP is estimated to decrease by 2%, while if the duration of the crisis exceeds three months, this rate of reduction is even higher (between 4% and 6%). Other international organizations have produced similar forecasts that predict a significant recession for the Greek economy, due to its high dependence on tourism and, consequently, the significant decline in non-residents travel receipts. Thus, the IMF (2020) and the EU (2020) predict a recession of 10% and 9.7%, respectively.

A recent study (Rodousakis & Soklis, 2020a) on the effects of the pandemic crisis on tourism concludes that every 1 billion euro of international travel receipts lost will lead to an overall (direct and indirect) reduction of Greek GDP and employment by 0.57% and 0.61% (26.4 thousand jobs), respectively, and an increase of the deficit in the balance of goods and services by 38.9%. Subsequent studies (Rodousakis & Soklis, 2020c; Mariolis et al., 2020), using data from recent input-output tables of the Greek economy, estimate that a decrease in international travel receipts in 2020 between 3.5 and 10.5 billion euro will cause, *ceteris paribus,* a decrease in GDP (between 2% and 6%) and in employment (between 2.1% and 6.4%), but also an increase in the deficit in the balance of goods and services (between 2.4 and 7.1 billion euro). The relatively large dependence of the Greek economy on tourism, which does not differ significantly from the rest of the Southern European countries (Rodousakis & Soklis, 2020d), is confirmed by the recent report of the Bank of Greece (2020), according to which a decrease of travel receipts by 1 billion euro would lead to a decrease in GDP by 0.49% and to that of employee incomes by 0.35%. The research of Papanikos (2020), on the other hand, considering the international pre-bookings of European destinations, examines the impact of the pandemic on Greek tourism based on three scenarios. According to the optimistic scenario, the decrease in GDP in the year 2020 due to the decline in tourism would be 16.8 billion euro compared to 2019.

The spread of COVID-19, as expected, also affects the supply side of Greek tourism. Two ITEP studies attempt to estimate the extent of the damage. According to the first study (ITEP, 2020a), which examines the market until March 14, 2020, it is estimated that the losses for Greek hotels from the cancellations of rooms and conferences will amount to 522 million euro (7.7 % of which corresponds to conferences). The survey reflected a drop in the rate of future bookings by 72% in 92% of year-round hotels and by 58% in 83% of seasonal hotels compared to 2019.[2] In addition, 91% of year-round hotels estimate that they will experience a turnover loss in 2020 of 51% due to room cancelations and 66% due to conference cancelations, while the corresponding loss for 83% of seasonal hotels will be 36% due to room cancelations and 48% due to conference cancelations. The survey also estimates that 38,234 jobs in 2020, or 20.5% of total hotel employment, will be at risk.

In their second survey (ITEP, 2020b), carried out from April 1-10, 2020 on a sample of 1,779 hotels out of a total of 9,954 members of the chamber (i.e., 18% of all hotels operating in the country), it was found that among the hotels year-round, 65% consider bankruptcy as possible or very possible (46.6% possible, 18.3% very possible). The corresponding percentage for seasonal hotels is 51.8% (40.5% possible, 11.3% very possible). In addition, the total loss of hotel turnover for 2020 was estimated at €4.46 billion (€1.2 billion for year-round hotels and €3.26 billion for seasonal hotels).[3] It was then estimated that 45,142 jobs are at risk.[4] Finally, it is estimated that the total need for funding is 1.79 billion euro (with funding needs reaching 498 million euro for year-round hotels and 1.29 billion euro for the seasonal ones).[5]

2. While the research was carried out, it was observed that only 25% of the seasonal hotels were under pressure to reduce prices by tour operators and only 12% of them to reduce the number of rooms, which anticipates a further deterioration in the rate of bookings and therefore the turnover of businesses. However, in the post-corona era, the discounts on the prices of the tour packages requested by the tour operators from the hoteliers are, on average, 25% compared to the original agreements. In some cases, the requirements of tour operators for discounts on packages reach up to 50%, citing special conditions in the contracts that have been signed (as most of this year's contracts have been closed since last summer), but also clauses about unforeseen change of Force Majeure and Hardship Clauses due to the effects of the COVID-19 crisis.

3. According to the same study, 95% of the year-round hotels forecast a decline in turnover of 56.3% on average for the year 2020, while the corresponding figure for seasonal hotels for the same year amounts to 56.1% on average.

4. A percentage of 57.3% of year-round operating hotels assess that their workforce will be reduced by 40%, while for 65.4% of the seasonal hotels, the figure reaches 41.5%.

5. A percentage of 71.1% of year-round hotels declare that funding is required, amounting on average up to 31.1% of their turnover. Correspondingly, the need for funding for 66.6% of the seasonal hotels amounts to 31.4%.

2. Distinction of the accommodation and the food sectors' turnover into international and domestic tourism and its projected path during the pandemic crisis

The two main components of the tourism services sector are accommodation services and food services. However, the impact of tourism on domestic economic activity significantly exceeds the direct impact of these two components, as it spreads to a large number of other activities. Public transport services such as airplanes, trains, ships, intercity buses, public transport and taxis, postal services and various cultural activities are, among others, services in which we can trace the multiplier effect of tourism.

This section uses the information contained in the weights of specific items of the CPI and the HICP to segment and differentiate the turnover of accommodation and food services into the part associated with international visitors and the part attributed to domestic activity. This distinction allows us to study separately the corresponding data that in any case constitute the core of the services part of GDP related to tourism. This distinction is enlightening for those who pursue economic policy and also contributes to making more accurate forecasts.

According to ELSTAT (2020a) the turnover of accommodation services enterprises in 2019 amounted to 6,991,184,282 euro, while that of food services enterprises to 6,059,184,851 euro. These two categories of services combined represent 6.96% of Greece's GDP in 2019.

Although we know the amount of turnover, there is a real difficulty in distinguishing this turnover in the part attributed to international tourism and in the part attributed to domestic tourism activity. For this reason, we will approach the issue of this distinction indirectly, i.e., with the help of the weights of the CPI and of the HICP and the information they provide us.

Essentially, the two price indices, the CPI and the HICP, contain the same items. Their differences are summarized in the weights attached to these items. The basic survey on which the CPI weights are based is the Household Budget Survey (HBS). The calculation of the HICP weights is based on the same survey, but data from the National Accounts are also used for the integration of the expenditure of the tourists as well. That is, tourist expenses are taken into account in the HICP but not in the CPI. Thus, by comparing the weights between the CPI and the HICP for accommodation and food services, we distinguish the differences presented in Table 1.

From Table 1, it can be concluded that the participation of international tourism in the turnover of accommodation services amounts to 81.77% (based on 2019 data), while its participation in the turnover of food services amounts to 32.26%. The weight of accommodation services, for example, in the HICP contains the information provided by the corresponding weight in the CPI and is considerably higher than that of the CPI. The excess has to do with the integration of tourist spending. Thus, 81.77% is the ratio of the difference between the weights of the two indices as a percentage of the HICP weight (81.77 = (32.61-5.95) / 32.61). Respectively, 32.26% is the ratio resulting from the difference of 44.91 points (= 139.21-94.29) as a percentage of the HICP weight (139.21).

From the above, it is obvious that the participation of international tourism is significantly higher in accommodation services than in food services. This big difference can be attributed to the fact that a large number of international tourists book hotels on an all-inclusive basis as well as to the fact that food services operate throughout the year, while in-

TABLE 1 CPI and HICP weights of certain items for 2019

Sector	HICP	CPI	Difference	Difference as a percentage of HICP
Food (and beverage) services	139.21‰	94.29‰	44.91	32.26%
Accommodation services	32.61‰	5.95‰	26.67	81.77%

Source: ELSTAT data, authors' own calculations.

TABLE 2 Breakdown of the 2019 turnover of accommodation services enterprises and of food services enterprises according to the origin of tourists (international and domestic)

Services	Turnover 2019 (in euro)	Non-resident visitor participation	Turnover attributed to international visitors (in euro)	Turnover attributed to domestic visitors (in euro)
Accommodation enterprises	6,991,184,282	**81.77%**	5,716,633,119	1,274,551,163
Food and beverage enterprises	6,059,184,851	**32.26%**	1,954,949,396	4,104,235,455

Source: ELSTAT data, authors' own calculations.

TABLE 3 Estimated turnover for 2020

Services	2019 Turnover (in euro)	Turnover estimate due to international tourism (15% of last year) (in euro)	Turnover estimate due to domestic tourism (80% of last year) (in euro)	Total turnover estimate for 2020 (in euro)	Percentage change compared to 2019
Accommodation enterprises	6,991,184,282	857,494,968	1,019,640,930	1,877,135,898	-73.15%
Food and beverage enterprises	6,059,184,851	293,242,409	3,283,388,364	3,576,630,773	-40.97%

Source: ELSTAT data, authors' own calculations.

ternational tourism is mainly limited to the summer months.

In Table 2, the turnover of accommodation enterprises and that of food enterprises is divided into the part attributed to international tourism and the part attributed to domestic tourism with the help of the weights calculated in the paragraphs above.

Based on the ELSTAT data (2020b), the turnover of accommodation services during the first quarter of 2020 amounted to 231,473,680 euro and that during the second quarter to 104,682,448 euro, recording annual changes of -17.1% and -94.3%, respectively, compared to the turnover of the corresponding quarters of 2019. Thus, in the first half of 2020, the turnover of accommodation services amounted to 336,156,128 euro and recorded a decrease of 84.2% when compared to the corresponding turnover of the first half of 2019.

Regarding the turnover of the food services sector, it amounted to 884,073,387 euro in the first quarter of 2020, and 592,729,473 euro in the second, recording annual changes of -10.3% and -59.0%, respectively, compared to the turnover of the corresponding quarters of 2019. During the first half of 2020, the turnover of the food services sector amounted to 1,476,802,860 euro and recorded a decrease of 39.3% when compared to the corresponding turnover of the first half of 2019.

Finally, a scenario is adopted which we believe is likely to prevail based, on the one hand, on the actual data available so far for the first half of the year and, on the other hand, on estimates for the already completed summer months. Based on the current picture of tourism, a rather moderate to unfavorable scenario is adopted, which predicts that the turnover from international tourism will be limited to 15% of that of the previous year, while that of domestic tourism will amount

TABLE 4 Estimated turnover for each half of 2020

2020	Accommodation turnover in 2019	Accommodation turnover in 2020	Annual percentage change compared to 2019	Food turnover in 2019	Food turnover in 2020	Annual percentage change compared to 2019
1st Half	2,125,510,041	336,156,128	-84.18%	2,432,488,686	1,476,802,860	-39.29%
2nd Half	4,865,674,241	1,540,979,770	-68.33%	3,626,696,165	2,099,827,913	-42.10%
Annual	6,991,184,282	1,877,135,898	-73.15%	6,059,184,851	3,576,630,773	-40.97%

Source: ELSTAT data, authors' own calculations.

to 80% of what was recorded last year, respectively. The figures based on this scenario are summed up in Table 3.

Although we know the turnover of each quarter of 2019 for accommodation and catering, we made the breakdown not on a quarterly basis, but on an annual basis, using the weights that apply throughout the year. For 2020, we already know the data of the first two quarters for each of the two turnovers. With the scenario we adopted, an estimate is made for 2020, and the total turnover of the second half of 2020 for accommodation and food services is calculated.

According to Table 4, the drop in turnover in accommodation services is of the order of 73%, while that in food services is of the order of 41%. The total drop is 58%. This result, without any multiplier effect, has, *ceteris paribus,* a downward effect of 4.05% on the country's GDP.

3. The impact of coronavirus on non-residents' travel receipts in 2020

In 2019, thirty-four million travelers arrived in Greece from eighty-two different countries, contributing 18.2 billion euro in travel receipts (which was about 56% of exports of services and 26% of total exports). A recent study (OECD, 2020c) ranks Greece as the ninth largest tourist industry among OECD countries, based on the number of international tourist arrivals for the year 2018. These figures constitute a historical record for the Greek tourism industry. The year 2020 seemed to be even more positive until the outbreak of the COVID-19 pandemic in mid-March in Greece. The lethal infectious disease first hit Asian countries and then spread to Europe and eventually to the rest of the world. Almost all countries have banned international travel. The Greek tourist market was negatively affected, like all the tourist markets in the world.

Greece implemented a lockdown policy, as did many other countries, in order to slow the transmission of the virus. The first case was reported in Greece on 26 February 2020 (WHO, 2020), and the government imposed a total ban on public traffic on 23 March, acting rather quickly after the first death was reported on 12 March. Restrictions imposed by the afore-mentioned general lockdown began to ease in June and were finally lifted in mid-July. However, this did not mean that economic activity would return to its pre-confinement level.

Table 5 shows the recent development of Greek international tourism in terms of annual travel receipts and arrivals of non-residents. As a percentage of GDP, revenues from international tourism increased from 5% in 2005 to almost 10% in 2019.

This section assesses the impact of the pandemic on the country's tourism demand. From the tourism demand variables, we choose to focus on the non-residents' travel receipts as they contribute directly to GDP. For this reason, the monthly non-residents' travel receipts of the year 2019 were used. Next, we assumed that for the year 2020, the non-residents' travel expenditure would be at least at the same levels as in 2019, without the pandemic.

In the first two months of 2020, travel receipts showed an increase of 22.9% compared to the corresponding period of 2019, leading to the conclusion that it would be the best tourist year of the last decade, with receipts reaching 20 billion euro, exceeding by at least 1.5 billion euro the corresponding figure in 2019 (18.2 billion euro). For the first half of 2020, in terms of non-residents' travel receipts, Greek tourism fell significantly

TABLE 5 Travel receipts and arrivals of non-residents, 2005-2019

Year	Travel receipts (million euro)	Arrivals (thousands of individuals)	Expenditure per travel (in euro)	GDP (million euro)	Travel receipts (% of GDP)
2005	10,730	14,388	746	199,242	5.39%
2006	11,357	15,226	746	217,862	5.21%
2007	11,319	16,165	700	232,695	4.86%
2008	11,636	15,939	730	241,990	4.81%
2009	10,400	14,915	697	237,534	4.38%
2010	9,611	15,007	640	226,031	4.25%
2011	10,505	16,427	639	207,029	5.07%
2012	10,442	16,947	616	191,204	5.46%
2013	12,152	20,111	604	180,654	6.73%
2014	13,393	24,272	552	178,656	7.50%
2015	14,126	26,114	541	177,258	7.97%
2016	13,207	28,071	470	176,488	7.48%
2017	14,630	30,161	485	180,218	8.12%
2018	16,086	33,072	486	184,714	8.71%
2019	18,179	34,005	535	187,456	9.70%

Source: Border Survey of the Bank of Greece and ELSTAT.

Note: GDP and travel receipts are expressed in nominal terms.

by 87.5%. The monthly data of international travel receipts for the first half of the year are available and derived from the Border Survey of the Bank of Greece[6]. For the estimation of the monthly non-residents' travel expenditure during the second half of 2020, we apply three scenarios (baseline, pessimistic, and optimistic).

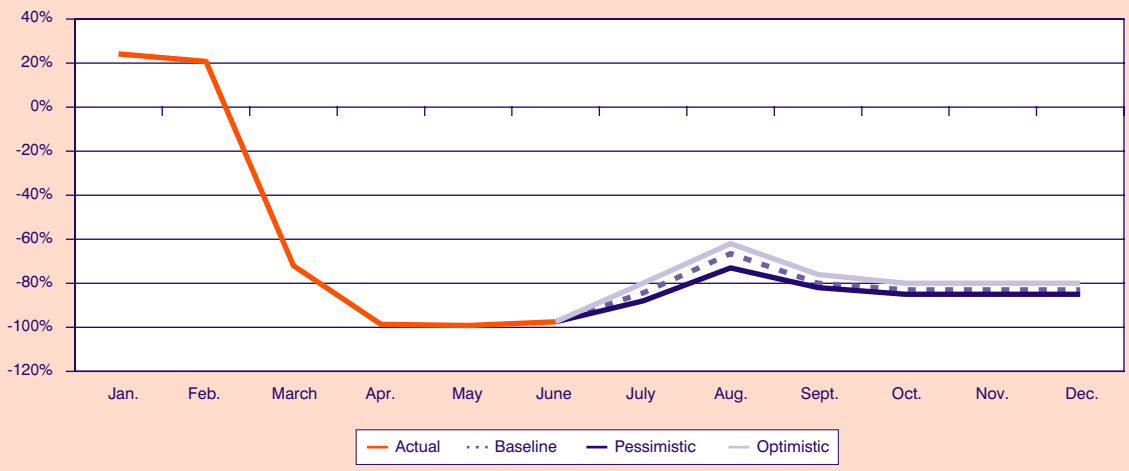
These three scenarios are analyzed as follows: (a) pessimistic –reduction by 83%, which means that only 17% of travel receipts will be achieved compared to 2019, (b) baseline –reduction by 80%, and (c) optimistic –reduction by 77%. These scenarios are based on data from the number of flights and airline plans of passenger seats from abroad[7] and take into account the gradual opening of international borders and the easing of travel restrictions. The pessimistic scenario, in fact, incorporates the further fall of the receipts from a second wave of the pandemic in Greece, as well as in other countries worldwide that constitute the origins of our international visitors. This is expected to reduce the duration of this year's tourist season and to further

6. The Border Survey was suspended on March 15th and July 1st of 2020 due to special travel conditions that emerged from the global impact of the coronavirus pandemic and the resulting restrictions on international transportation. The set of rules followed in order to secure the comparability of the produced data through time were the following:

a. For the time periods 1-15/3/2020 and 16/3/2020-30/6/2020, the volume of incoming and outgoing traffic was estimated for each border station.
b. The data collected for the period 1-15/3/2020 were checked, processed and analyzed using the existing methodology.
c. To produce the data for the period 16/3/2020-30/6/2020, travel flows were extrapolated using detailed official data of the flows of each border station, also taking into account historic data of travel flows for each month and each border station (Bank of Greece, Press Release, August 21, 2020). The methodology of the Border Survey is presented in detail in Pantelidis, E. and Kouvatseas, G. (2006).

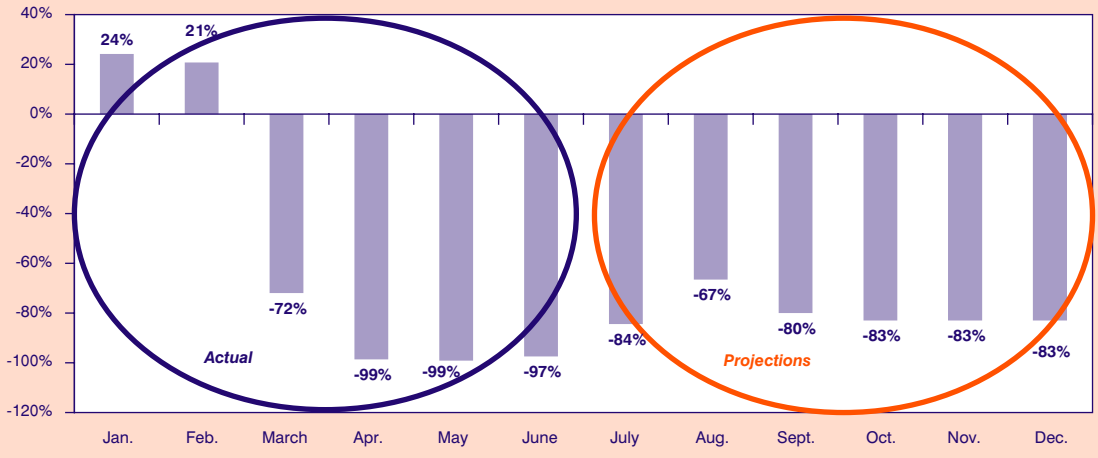
7. It is worth noting that air transport is traditionally the main way of transporting tourists to Greece. Of the total 34 million permanent residents of other countries that Greece welcomed in 2019, 64% came by air, 33% by road and 3% by sea, while the use of railways was negligible.

CHART 2
Non-residents' travel receipts in 2020: three scenarios (percentage change %)



Source: Border survey of the Bank of Greece and authors' own calculations.

CHART 3
Change in monthly travel receipts in year 2020 (baseline scenario)



Source: Bank of Greece's Border Survey and authors' own calculations.

reduce the travel expenses in the third and fourth quarters. The change in the actual (until June 2020) travel receipts, but also the estimates per month for the second half of 2020 and per scenario are presented as well in Chart 2.

As the baseline scenario is considered to be the most likely scenario to occur, Chart 3 shows the change in monthly travel receipts for the year 2020 based on this scenario, taking into account the actual data as well as the estimates from July to the end of the year.

The second and, especially, the third quarters are particularly important in terms of participation in total travel expenses. Thus, of the 18.2 billion euro of non-residents' travel expenditure in 2019 (see Table 5), more than half (59%) took place in the third quarter of the year and 26% took place in the second quarter. A percentage of 11% was realized in the last quarter and only 4% of the receipts in the first quarter of 2019. Assuming that these percentages would have remained unchanged in 2020, Table 6 shows the evolution of

TABLE 6 The impact of coronavirus on travel receipts based on three scenarios
(in bn euros)

	Scenarios		
	Baseline	**Pessimistic**	**Optimistic**
Year 2019			
Travel receipts	18.2	18.2	18.2
Travel payments	2.7	2.7	2.7
Net travel receipts	15.4	15.4	15.4
Year 2020			
Travel receipts *(estimate)*	**3.6**	**3.1**	**4.1**
Travel payments *(estimate)*	0.7	0.7	0.8
Net travel receipts	2.8	2.4	3.3
Change in 2020			
Travel receipts	-14.6	-15.1	-14.1
Travel payments	2.0	2.0	2.0
Total	**-12.6**	**-13.1**	**-12.1**

Source: Border Survey of the Bank of Greece and authors' own calculations.

non-residents' travel expenditure based on the three scenarios.

As mentioned above, due to the intense seasonality of tourism activity, a significant part of the annual non-residents' travel expenditure is collected in the period from June to September. The timing of the pandemic and the subsequent policies to deal with it essentially led to the suspension of hotel[8] and accommodation services and the imposition of travel restrictions until June, followed by their gradual release by mid-July. The inevitable contraction in activity during the high tourist season is reflected in our annual forecasts under the three alternative scenarios. According to these, in 2020, non-residents' travel receipts will range between 3.1 and 4.1 billion euro, while in our baseline scenario they are estimated at just 3.6 billion euro.

In terms of net travel receipts, the situation improves slightly due to the projected reduction in travel payments that reflect fewer trips of Greeks abroad. In our basic scenario, we predict a reduction of travel payments by 2.0 billion euro. This offsets part of the decline in travel receipts and thus, at the level of net travel receipts, losses are estimated between 12.1 and 13.1 billion euro, according to the three scenarios (see Table 6). This development is expected to negatively affect the country's GDP for 2020, as the expected losses of non-residents' travel expenditure represent between 6.5% and 7.0% of GDP (in nominal values), while the multiplier impact of non-residents' travel expenditure is not included. In addition, the analysis does not take into account the fiscal measures implemented by the government in order to support the economy, which are estimated to partially offset a significant part of the negative effects on the Greek economy from the decline in travel receipt.

Recent research papers (Rodousakis and Soklis, 2020b; 2020d) state that the multiplier effects of government spending on the Greek economy are significantly stronger than those of tourism demand. In addition, the recording and quantifying of government spending related to the effects of COVID-19, through a performance budget, makes the assessment of the effectiveness of targeted public economic policy possible (Liargovas and Psychalis, 2020).

8. According to ITEP (2020c), a percentage of 6.4% of hotels have decided not to launch in 2020.

4. Conclusions

As the dependence of the Greek economy on tourism is relatively large, the emergence of the pandemic crisis this year, on the one hand, shows that this will be the most difficult year of the last decades for our country and, on the other hand, makes the need for the study and analysis of the tourism industry imperative. The contribution of this article is twofold: first, it separates the turnover of the accommodation and food services sectors and examines what percentage comes from international and domestic tourism. Second, it estimates the non-residents' travel receipts for the year 2020. In summary, the main points of the article are the following:

- The data of the first half of 2020 show that in terms of travel receipts, Greek tourism fell significantly, by 87.5%.
- Despite the excellent performance of Greece in the management of the pandemic crisis during the opening up of the borders to international tourism in the beginning of July, expecting to boost the tourist flows during the second half of the year, the loss of the international travel receipts in 2020 is estimated to range between 14.1 and 15.1 billion euro compared to 2019.
- Based on three scenarios (pessimistic, baseline, optimistic) and taking into account the number of flights and the planning of airline seats on international flights, it is estimated that non-residents' expenditure for 2020 will range between 3.1 and 4.1 billion euro.
- Taking into account the weights of the CPI and HICP, the percentage of turnover of the accommodation and food sectors attributed to international and domestic tourism was estimated. In terms of accommodation, the share of inbound tourism in 2019 was 82% and that of domestic tourism was 18%, while in food services the respective shares were 32% and 68%. In fact, the behaviour of foreign visitors was different from that of domestic visitors during the first half of this year. Something similar is expected for the second half of 2020.

The relatively large dependence of the Greek economy on tourism, which nevertheless does not significantly differ from that of the countries of Southern Europe, makes it clear that the Greek economy is particularly vulnerable to such an adverse event as the coronavirus pandemic and probably calls for a review of the existing model of Greek tourism.

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Investigation of the economic sustainability of Greek agricultural holdings by different types of farming

Ioanna Reziti*

Abstract

The purpose of the article is to examine the economic sustainability of Greek agricultural holdings at an aggregate level by type of farming using the FADN (Farm Accounting Data Network) database for the period 2015-2018. The empirical application focuses on the calculation of profitability and productivity indicators. For the first indicator, the DuPont analysis is used to determine the performance of the holdings and the factors that affect their profitability. The results show that only granivores and cattle holdings increased their profitability during the examined period. Four of the twelve holdings show a loss while in total there is a reduction of the profit margin by 20%. Except for granivores holdings, productivity is declining on all other holdings.

Keywords: *Sustainability, productivity, profitability, holdings, DuPont identity.*

JEL: *Q01, Q12, Q13*

1. Introduction

The concept of sustainability has become an important aspect of modern business. The sustainability of agribusiness is even more important as agricultural activities have different effects on the economic, social and environmental situation of rural areas. The economic dimension of agribusiness is important in terms of ensuring the viability and prosperity of the rural population. Many scholars see the concept of economic sustainability as the ability of farmers to generate income to provide a reasonable standard of living and to maintain the level of capital used in agricultural activities in order to remain active in the workplace given the long-term horizon.

In recent years, sustainable agricultural holdings have been at the heart of EU agriculture due to climate, environmental and economic challenges, calling for a fundamental shift to a more sustainable agricultural sector. To this end, one of the nine specific objectives of the future Common Agricultural Policy (CAP) 2021-2027 is to support "agricultural income sustainability and resilience across Europe to support food security (through basic income support) for sustainability".

According to Latruffe et al. (2016), for farms, the contribution to sustainable agriculture often involves a) the production of goods and services (economic function), b) the management of natural resources (ecological function), and c) the contribution to rural dynamics (social function). The harmonious combination of these three interconnected functions is the backbone of sustainable agriculture.

The analysis of agricultural sustainability at the level of holdings is proposed as the most appropriate spatial unit in terms of the implementation of sustainable agricultural practices (Kelly et al., 2018). However, this study focuses on the overall level of holdings per product specialization due to lack of financial data at the holding level. Various methodologies, frameworks and indicators have been developed and presented to assess sustainable development without yet having a generally accepted tool (Singh et al., 2012). In a recent article, Tzouramani et al. (2020) assessed the sustainability of the Greek agricultural system at the level of holding for 2015 using the analytical hierarchy process and the FADN database (Farm Accountancy Data Network). The results suggest that permanent crops, olive trees and extensive livestock (sheep holdings) are more viable systems than intensive and arable crops.

In this article, we will focus on the analysis of the economic dimension of sustainability or economic sustainability. According to Latruffe et al. (2016), economic sustainability is considered the long-term survival of an agricultural system in a changing economic context. In other words, economic sustainability is the long-term viability of the farm. In particular, for family holdings, economic sustainability is related to the problem of financial resilience, which is defined as "the ability of a holding to be transferred to a successor" (Latruffe et

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al., 2016). Thus, the commitment of the family business is an important incentive for the sustainability of agricultural holdings. Farm holdings that are not economically viable may be economically sustainable due to the non-farm income of the farm members (Hennessey et al., 2008). Farmers decide on in-farm and off-farm income as a portfolio, which is a tool of strategic risk management.

To assess economic sustainability at the holding level, indicators are used that refer to the profitability, liquidity, stability and productivity of the holding. Van der Meulen et al. (2014) used net agricultural income, labour productivity and solvency to quantify the economic sustainability of Dutch dairy farms. Wrzaszcz and Zegar (2014) calculated the level of economic sustainability of Polish farms based on the FADN database, using indicators of land productivity, labour profitability, market orientation, household income sources and maintenance. Vitunskiene and Dabkienė (2016) employed a total of 23 indicators to cover all three dimensions of sustainability for Lithuanian farms using the Farm Accountancy Data Network (FADN), eight of which are economic indicators. Among the eight economic indicators were productivity, farm income, solvency and farm risk management.

Roesch et al. (2017) and Zorn et al. (2018) measured the economic sustainability of Swiss farms by applying productivity, liquidity and stability indicators. They claim that the profitability ratio reflects the financial success of a holding in the agricultural enterprise; the liquidity ratio refers to the holding's ability to meet current obligations, and the stability index shows the ability of the holding to maintain profitability and liquidity in the face of unpredictable changes in the business environment. According to Roesch et al. (2017), there are strong dependencies between these indicators as good profitability promotes a high degree of liquidity and therefore farming stability. The profitability index and FADN have also been used to assess economic sustainability by Diazabakana et al. (2014) and Baležentis et al. (2019).

As mentioned above, profitability is one of the main indicators that can be applied to analyze the economic dimension of agricultural sustainability. Profitability can be measured in many different ways. Important indicators of a company's profitability in the financial literature are the return on assets (ROA) and the return on equity (ROE). Baležentis and Novickyte (2018) analyzed the profitability of family farms in Lithuania expressed by the ROE index and in relation to its factors: the profit margin, turnover and leverage.

In addition, productivity is a measure that shows us the ability of the factors of production to produce a product. It is generally measured as a partial productivity ratio, which is the ratio of product to factor of production. For example, Hennessy et al. (2008) calculate labor productivity as income per unpaid unit of labour and land productivity as gross production per hectare.

Given the growing integration of agricultural markets and globalization, there is a need to promote the continued development of agricultural enterprises with an emphasis on increasing competitiveness and resilience to uncertainties. Farmers should be able to adequately respond to changes in the business environment, plan and anticipate their activities and be funded accordingly. Given these issues, it is very important to analyze the financial performance of agricultural holdings.

The aim of the article is to evaluate the financial sustainability of Greek holdings by type of farming using data from FADN[1] for the period 2015-2018. The analysis is based on two economic concepts: productivity and profitability of holdings. This article is organized as follows: Sections two and three present the methodology and data used. Section four presents and analyzes the results, and section five presents the conclusions that emerge from this work.

2. Methodology

The analysis of profitability and the evaluation of its main factors are a crucial element for the evaluation of financial performance. Performance measurements such as operating profit margin, turnover ratio, return on assets, and return on equity are extremely valuable to a farm manager.

The operating profit margin shows the net income achieved for each euro of sales. The turnover ratio measures the revenue generated per euro of assets and shows how effectively the company uses these assets. The return on assets is a measure that managers can use to determine if capital generates an acceptable rate of return and shows the amount of sales for each euro of assets. The return on equity helps managers to estimate efficient use of equity. All these measures give us information about the economic performance

1. For further analysis of the literature on FADN as the most widely used database for the assessment of agricultural sustainability, see Dabkienė (2016).

of the agricultural holding. The above four measures are the core of the manager's analysis of the financial performance of the holding and are presented in the DuPont identity.

The DuPont analysis is a common and useful tool for evaluating and understanding profitability factors. According to Blumenthal (1998), the DuPont analysis is a useful framework for visualizing financial information and is a good tool to help managers understand how operational, financial and investment decisions affect a firm's financial performance.

According to Mishra et al. (2009, 2012), in the DuPont identity, the return on equity (ROE) is factorized in:

$$\frac{R_t}{E_t} = \frac{R_t}{A_t} \times \frac{A_t}{E_t} \quad (1)$$

where R_t is the profit (benefit), E_t is the equity and A_t are the assets during period t. The ROE breakdown can be further improved by looking at sales variables in the analysis. In this case, the three multiplicative terms of ROE are defined. The profit margin shows the creation of profit from sales (operating profitability); assets turnover reflects the productivity of assets, and the completion of the credit market is represented by the financial leverage ratio. The multiplicative relationship between the three discussed variables is as follows:

$$\frac{R_t}{E_t} = \frac{S_t - C_t}{S_t} \times \frac{S_t}{A_t} \times \frac{A_t}{E_t} = P_t N_t L_t \quad (2)$$

where S_t is sales, C_t is cost of production and P_t, N_t and L_t indicate profit margin, asset turnover and financial leverage, respectively, during period t. The asset turnover rate shows how well the assets are used to produce products and, consequently, to generate sales. Financial leverage expresses the financial risk of a business and refers to the use of loan capital for the purpose of repaying equity. In the case of agricultural performance analysis, we replace the profit ratio with net income minus family wages (as applied in FADN). So the return on equity depends on

- the ability of the holding to control costs,
- the ability of the holding to use the assets effectively, and
- the degree of financial leverage.

In addition to the DuPont analysis, the Return On Capital Employed (ROCE) ratio is an additional assessment in the analysis of operating profitability where working capital is taken as the sum of debt and equity, with the former including long-term and short-term debt.

For family holdings, the ROCE index is calculated according to Baležentis et al. (2018):

$$\frac{N_t}{CE_t} = \frac{N_t}{G_t} \times \frac{G_t}{CE_t} = NOPAT \times CR_t \quad (3)$$

where N_t is the net agricultural income, G_t is the gross agricultural income and CE_t is the capital used in period t. In this case, ROCE splits into two factors –Net Operating Profit After Tax (NOPAT) and the percentage of capital employed (CR_t) in total sales. ROCE shows how efficiently the holding utilizes its available capital by examining the net profit generated in relation to each euro of capital used.

In order to examine the productivity of the factors of production, the following selected indicators are used:

- Land productivity
  - Gross income / Cultivated area in hectares
- Labor productivity
  - Gross income / Annual unit of work[2]
- Capital productivity
  - Gross income / Total assets.

3. Data used

The FADN (Farm Accountancy Data Network) electronic database of the European Commission provides us with the data that we will use to calculate the indicators presented above for the period 2015-2018 by type of farming. The examined period was selected based on the most recent data available (2018) and a three-year analysis (2015).

To apply relations (2) and (3) for the years 2015 and 2018, we must determine the appropriate variables that constitute the components of (2) and (3). Table 1 shows the FADN variables in relation to the respective components needed to calculate ROE, ROCE and productivity factors for family holdings.

According to FADN, holdings are classified according to the "type of farming" (TF) into main categories with TF14 codes: (15) specialist COP, (16) specialist other fieldcrops, (20) specialist horticulture, (35) specialist wine, (36) specialist orchards and fruits, (37) specialist olives, (38) permanent crops combined, (48) specialist

2. The Annual work unit corresponds to the full-time employment (225 days, at 8 hours each day) of one person per year on the holding.

TABLE 1 Economic sustainability ratios for family holdings

Ratios	FADN variables
ROE calculation	
Profit margin = (Farm net income – Family renumeration)/ Gross farm income Family renumeration = (Wages paid/Labour) × Family labour.	Net farm income – SE420 Gross farm income – SE410 Wages paid – SE370 Paid labour input – SE020 Unpaid labour input – SE015
Asset turnover = Gross farm income/ Total assets	Total assets – SE436 Gross farm income – SE410
Leverage = Total assets/Net worth	Total assets – SE436 Net worth – SE501
ROCE calculation	
NOPAT margin = Farm net income/Gross farm income	Net farm income – SE420 Gross farm income – SE410
Capital employed ratio = Gross farm income/Net worth + Financial dept	Gross farm income – SE410 Net worth– SE501 Total liabilities – SE485
Labour productivity	
Labour productivity = Total output/Annual working unit	Total output – SE131 Paid labour input – SE020
Capital productivity	
Capital productivity = Total output/Total assets	Total output – SE131 Total assets – SE436
Land productivity	
Land productivity = Total output/Land	Total output – SE131 Total utilized agricultural area – SE025

sheep and goats, (49) specialist cattle, (50) specialist granivores (pig and poultry holdings), (60) mixed crops, (80) mixed crops and livestock.

4. Results

In this section, we will present in detail the results of two financial relationships and productivity that were used to measure the financial sustainability of Greek family holdings. The return on equity (ROE) shows the return on holdings in relation to equity. This ratio objectively evaluates the effectiveness of the family activity of the holding because it shows how effectively the owner uses his capital. The return on working capital (ROCE) shows how much net operating profit after tax is spent on one euro of working capital, which reflects the efficiency of the use of total equity and debt capital.[3]

Tables 2, 3 and 4 show the components of return on equity by identity (2). In Table 3, we observe that better use of assets in their performance is shown only by holdings specialized in granivores, with an increase of 36.74%. The same holdings also showed the largest increase in profit margin (174.02%), leading to the largest increase in return on equity, by 271%. Table 5 shows that only holdings specializing in cattle and

3. It is possible to settle the debts owed by farmers to credit institutions on favorable terms that take into account, in principle, the financial viability of each farmer based on his current assets and income.

TABLE 2 Profit margin per type of farming

Code TF14	P_t		
	2015	2018	% change
15	0.208	0.237	14.07
16	0.247	0.302	22.33
20	0.247	0.317	28.56
35	0.189	0.248	31.39
36	0.329	0.226	-31.23
37	-0.170	-0.215	26.11
38	-0.032	-0.039	23.93
48	0.465	0.337	-27.50
49	0.528	0.729	38.05
50	0.180	0.494	174.02
60	0.239	0.006	-97.54
80	0.275	0.171	-37.68
Total*	0.240	0.192	-20.23

* The total holdings do not appear as the average of the twelve categories, but are a representative unit of the TF14 (Type of Farming) grouping of FADN holdings.

TABLE 3 Asset turnover per type of farming

Code TF14	N_t		
	2015	2018	% change
15	0.181	0.160	-11.81
16	0.217	0.158	-27.12
20	0.346	0.222	-36.06
35	0.218	0.150	-31.36
36	0.211	0.138	-34.65
37	0.144	0.073	-49.34
38	0.156	0.102	-34.53
48	0.321	0.211	-34.12
49	0.235	0.196	-16.66
50	0.160	0.219	36.74
60	0.245	0.134	-45.44
80	0.241	0.154	-36.03
Total	0.215	0.140	-34.99

TABLE 4 Financial leverage per type of farming

Code TF14	L_t		
	2015	2018	% change
15	1.006	1.000	-0.61
16	1.007	1.000	-0.63
20	1.023	1.000	-2.21
35	1.000	1.000	-0.01
36	1.004	1.000	-0.34
37	1.005	1.000	-0.42
38	1.004	1.000	-0.38
48	1.009	1.000	-0.74
49	1.015	1.000	-1.32
50	1.009	1.000	-0.89
60	1.004	1.000	-0.38
80	1.003	1.000	-0.33
Total	1.006	1.000	-0.54

TABLE 5 ROE per type of farming

Code TF14	ROE		
	2015	2018	% change
15	0.038	0.038	-0.02
16	0.054	0.048	-11.41
20	0.087	0.070	-19.62
35	0.041	0.037	-9.82
36	0.069	0.031	-55.21
37	-0.025	-0.016	-36.38
38	-0.005	-0.004	-19.16
48	0.150	0.071	-52.58
49	0.126	0.143	13.54
50	0.029	0.108	271.37
60	0.059	0.001	-98.66
80	0.066	0.026	-60.26
Total	0.052	0.027	-48.42

TABLE 6 NOPAT margin per type of farming

Code TF14	NOPAT		
	2015	2018	% change
15	0.533	0.507	-4.76
16	0.602	0.583	-3.31
20	0.658	0.577	-12.34
35	0.731	0.661	-9.51
36	0.727	0.614	-15.45
37	0.716	0.494	-31.02
38	0.716	0.592	-17.41
48	0.833	0.759	-8.85
49	0.758	0.778	2.73
50	0.665	0.719	8.04
60	0.772	0.549	-28.98
80	0.801	0.686	-14.30
Total	0.718	0.620	-13.64

TABLE 7 Capital employed ratio per type of farming

Code TF14	CR_t		
	2015	2018	% change
15	0.181	0.160	-11.81
16	0.217	0.158	-21.12
20	0.346	0.222	-36.06
35	0.218	0.150	-31.36
36	0.211	0.138	-34.65
37	0.144	0.073	-49.34
38	0.156	0.102	-34.52
48	0.321	0.211	-34.11
49	0.235	0.196	-16.66
50	0.160	0.219	36.74
60	0.245	0.134	-45.44
80	0.241	0.154	-36.03
Total	0.215	0.140	-34.98

TABLE 8 ROCE per type of farming

Code TF14	ROCE		
	2008	2018	% change
15	0.096	0.081	-16.01
16	0.130	0.092	-29.53
20	0.228	0.128	-43.95
35	0.159	0.099	-37.89
36	0.153	0.085	-44.75
37	0.103	0.036	-65.05
38	0.112	0.060	-45.92
48	0.267	0.160	-39.95
49	0.178	0.153	-14.38
50	0.106	0.157	47.74
60	0.189	0.073	-61.25
80	0.193	0.106	-45.18
Total	0.155	0.087	-43.86

TABLE 9 Productivity of the factors of production per type of farming

Code TF14	Land productivity		
	2008	2018	% change
15	1,064	1,095	2.92
16	1,558	1,572	0.90
20	17,124	20,981	22.53
35	5,535	3,061	-44.70
36	5,362	4,653	-13.22
37	2,175	1,737	-20.14
38	2,996	2,560	-14.53
48	5,597	1,833	-67.24
49	3,038	3,025	-0.45
50	23,748	199,301	739.22
60	2,437	2,028	-16.77
80	3,260	2,203	-32.41
Total	2,939	2,195	-25.29

TABLE 9 (continued)

Code TF14	2008	2018	% change
		Labour productivity	
15	452,950	209,500	-53.75
16	1,399,686	123,156	-11.83
20	94,182	53,025	-43.70
35	129,767	94,039	-27.53
36	103,750	79,100	-23.76
37	101,636	70,415	-30.72
38	134,800	99,688	-26.05
48	164,496	134,746	-18.09
49	117,144	102,625	-12.39
50	500,158	900,840	80.11
60	167,377	88,700	-47.01
80	284,322	151,243	-46.81
Total	138,294	100,571	-27.28
		Capital productivity	
15	0.223	0.215	-3.65
16	0.208	0.188	-9.45
20	0.528	0.352	-33.32
35	0.240	0.190	-20.85
36	0.242	0.177	-26.79
37	0.132	0.083	-37.21
38	0.159	0.128	-19.82
48	0.445	0.301	-32.28
49	0.286	0.236	-17.24
50	0.907	1.015	11.93
60	0.264	0.186	-29.39
80	0.319	0.218	-31.76
Total	0.252	0.188	-25.41

granivores improved the return on equity; the rest are declined, with mixed crops holdings experiencing the largest drop (-98.66%).

The financial leverage indicator follows a negative trend for all holdings, with a different percentage for each one. Its value indicates that all holdings rely on their own capital to face difficulties that have arisen and to be able to survive after the economic crisis. Indeed, as a result of the economic downturn, there was a reduction in liquidity and an underfunding of farmers. Thus, the effect of foreign capital on profits is zero.

Olive and permanent crops holdings show a negative profit margin (Table 2), showing their inability to control costs. Cattle holdings use resources efficiently and show the largest increase in profit margins (38.05%), resulting in an increase in return on equity (13.54%). Granivore holdings significantly improved their return on equity due to the large increase in their profit margin (174.02%).

In Table 8, we observe that only the granivore holdings increased (47.74%) the profits from the total capital employed. This is due to the large increase in the capital used, by 36.74% (Table 7). In all other holdings the return on capital used decreased, with the largest decrease in olive growing. Thus, most holdings do not use the total capital to generate profits. Sheep and goat holdings in 2008 showed the highest ROCE, but in the following years, it decreased (40%). However, the unaffordable bank financing available to farmers led to the reduction of the total capital because farmers relied only on their own resources (equity), which decrease over time.

Table 9 presents the evolution of the productivity of the factors of production (land, labour and capital) per type of farming. Productivity results are in line with financial profitability ratios. Only granivore holdings increased the productivity of all three factors of production, which happened because their income increased significantly (36%). Also, from 2016 and onwards, pig holdings fell by about 40% and poultry by 60%, with the result that the land input decreased by 84% and the land productivity increased excessively by 739%. Also, a large decrease was observed in labour (24%), but with an increase in output by 36%, resulting in an increase in labour productivity by 80%.

Olive holdings had the largest reduction (37%) in capital productivity because, although the capital used increased by 30%, the income decreased by 18%. Mixed crops show the largest decrease in labour productivity due to the increase in labour by 77%.

Finally, sheep and goat holdings have the largest decrease in land productivity (67%) due to the increase of land by 161% and the reduction of output by 14%. The land productivity of orchards and fruits increased by 22% due to the increase in income by 24%, while the cultivated area remained stable; these holdings showed a capital increase of 86%.

5. Conclusions

The DuPont analysis we followed enables us to identify and evaluate the key factors that have a significant impact on the economic activities of Greek holdings during the period 2015-2018. Financial ratios (profitability analysis), return on equity, return on capital employed and productivity of the factors of production are used to assess the economic sustainability of holdings.

Most holdings are faced with adverse changes in the return on equity, where mainly all changes in the return on equity are affected by changes in asset turnover and profit margin, while the effect of foreign capital is zero due to the coverage of liabilities with equity. Many holdings suffered losses due to either low output prices, due to increased competition, or reduced production. Overall, the holdings reduced their profit margin (by a total of 20%). It seems that organizing in Producer Organisations could help increase the bargaining power of farmers and reduce production costs by achieving higher prices.

All holdings other than horticultural and granivore holdings do not use their assets effectively. Advise for better management of the holding (utilization of the system of agricultural advisors of the CAP) is necessary.

The reduced return on equity indicates that producers either over-invested capital that was not fully productive or had reduced profits due to adverse conditions (financial crisis).

The negative trend in the return on capital employed for all holdings (except for granivores) was mainly affected by the negative change in the capital used. The year 2018 is characterized as a year with declining asset returns compared to 2015.

Combating the declining productivity on almost all holdings requires improving the efficiency of the factors of production through the diffusion of new technologies and innovation in the production process. In this direction, the optimal utilization of the measures of Pillar II of the CAP is necessary. Examples include measures such as knowledge transfer and information actions, investment in physical assets, the establishment of producer groups and organisations, agri-environmental and climate measures, cooperation and technical support.

The present work is a first approach to the investigation of economic sustainability and perhaps its results will help relevant stakeholders target specialized policy-making. At the same time, the results can benefit producers themselves in making meaningful decisions about the sustainability of their holdings.

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