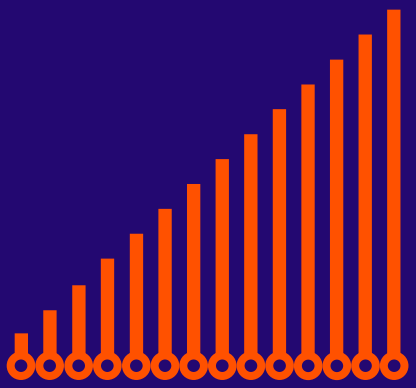
CENTRE OF PLANNING AND ECONOMIC RESEARCH

Issue 53, February 2024

GREEK ECONOMIC OUTLOOK



- Recent (macro-)economic developments
- Fiscal developments
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GREEK

Economic Outlook

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Executive Summary

Global economy slows down due to increased risks

The year 2023 recorded a global GDP growth rate that was slightly lower than that of 2022 (see section 1.5). Despite initial estimates of a further slowdown, the global economy showed an impressive resilience in the face of negative monetary and financial conditions, increased geopolitical uncertainty, and severe weather events. This was due to the particularly positive performance of the economies of the US, Japan and many developing countries in the first half of last year. However, the projections for 2024 are not as positive, as the majority of international organisations agree that global GDP growth will slow for the third consecutive year. Instead, a gradual acceleration of global economic growth is expected in 2025. The forecast for 2024 reflects several negative effects, such as contractionary monetary policy, adverse financial conditions, slow growth in international trade and low investment in production. Further, it reflects heightened concern and uncertainty among businesses and households due to risks threatening normal economic functioning globally. Reports by international organizations point out a negative outlook due to various risks such as expanding conflict, high inflation, increased pressures in money and capital markets, lower GDP forecasts for China, protectionist measures affecting international trade, and the recurrence of extreme weather events. Despite the challenges, the future remains uncertain and the global economy showed strong resilience in 2023. It is possible that positive turnarounds, such as a rapid decline in inflation or a strengthening of the Chinese economy, will improve the economic picture beyond expectations. However, the current economic situation does not allow for a safe prediction of future developments.

However, the Greek economy remains on a steady growth path

Based on our recent forecasts (see 1.3), average annual real GDP growth in Greece will reach 2.2% in 2023. This growth rate is expected to be maintained for 2024, indicating a continued upward trend and a stable growth rate for the Greek economy. However, the considerable uncertainty that characterizes the current economic horizon makes these forecasts prone to fluctuations. In both 2023 and 2024, the European Union (EU) economies face significant challenges, such as rising inflation and interest rates, geopolitical tensions and climate change. Despite these challenges, Greece appears to have significant potential for a more favourable economic path, taking advantage of opportunities from improving economic conditions in the EU, the positive outlook for important sectors of the economy, the upgrading of its credit rating and the implementation of important reforms and investments through the use of the Recovery and Resilience Fund and the new NSRF.

The stock market performs impressively

In addition to the encouraging growth of the national economy, Greece's success in regaining investment grade status played a key role in the excellent performance of the Greek stock market in the year 2023, resulting in a significant increase in positive returns, market capitalisation and transaction value compared to the previous year (see section 1.4). On the contrary, the bond market was disrupted by the repeated interest rate hikes by the European Central Bank (ECB), burdening the cost of borrowing and lending. However, in the last months of 2023, bond yields declined, thanks to the pause in the ongoing interest rate hikes by the ECB and the recovery of the investment grade rating for Greece. In addition, 2023 was marked by an impressive performance in the Greek institutional management market, with increased returns, assets and capital inflows. Finally, Greece's return to investment grade in 2023 by international rating agencies such as Rating and Investment Information (R&I), Scope Ratings, DBRS Morningstar, Standard & Poor's and, most recently, Fitch, paves the way for Greece to receive an investment grade from the (demanding) US rating agency Moody's next March. Achieving investment grade brings multiple benefits, such as lower borrowing costs for the government and corporations, attracting a wider investor base for Greek stocks and bonds, and the possibility of reintegrating the Greek stock market into developed markets.

The labour market is constantly improving

The good performance of the Greek economy is also reflected in the labour market, which continues to perform positively, with unemployment continuing to fall and employment increasing, while hours worked appear to be growing faster than employment (see section 3.1). This has contributed to nominal wage growth, although high inflation has eroded any increases. Although the number of people in employment has not yet reached pre-crisis levels, the employment rate for the 15-64 age group has reached historic highs. This increase is partly a result of population decline, which is a cause for concern, particularly as increased labour market participation does not seem to be a solution, leading to a shrinking labour force. This shrinkage is a major challenge in view of the increasing staff shortages that are frequently highlighted. In 2023, the number of people employed as employees increased by 116,000, with the majority of recruitment being for full-time positions. Despite a decline in the number of the unemployed over the last year, the number of the unemployed remains higher than the minimum of the last decade, while the unemployment rate, despite its general decline, remains the second highest in the European Union (EU27), after Spain. This suggests that there is no room for complacency, as the labour market faces multiple challenges that require constant attention and efforts to improve.

The (necessary) increase of the minimum wage

Although inflation has already been contained, increases in basic goods remain quite high. This, combined with the government's stated intention to complete the minimum wage setting process before the start of the tourist season, has led the government to accelerate and shorten the minimum wage setting process. Given that all forecasts for 2024 converge to a growth rate of the Greek economy at about the same level as in 2023, but with significantly lower inflation, around 3%, the stakes for economic policy are to increase wages in order to restore, as much as possible, the purchasing power of wage earners, but without further increasing inflation (costs) or deteriorating the country's international competitiveness due to an increase in unit labour costs. Therefore, it is advisable for the political leadership to know in advance the expected effects of a change in the minimum wage, considering the current conditions of the Greek economy. The implications of any change in the minimum wage are useful to be explored in advance and taken into account by economic policy makers, especially in the current context, which follows a period of deep recession due to the pandemic but is not far from the decade of economic crisis with all the austerity policies that accompanied it and the economic burdens it left behind.

And the (equally necessary) acceleration of the digitization of the Greek economy

The multiple challenges of the global economy led to the assessment that the Greek economy needs to be shielded by accelerating digital transformation and, therefore, by enhancing the efficiency of the public and private sectors (Greek National Productivity Board, KEPE, 2023).[1] Although significant progress has been made in various areas of digital transformation, the country remains significantly behind its European partners as well as the European average in most of the relevant indicators (see section 4.1). Mention should be made of the private sector, which seems to be widening the gap with its European counterparts, ranking at the bottom of the European digital growth rankings. In contrast, the digitization of the public sector is moving at a faster pace than its European counterparts, coming close to the European averages in most indicators. However, digital infrastructure urgently needs to be strengthened and upgrading work accelerated, as the country not only lags its partners in terms of network speed, but its progress is relatively slower, consistently ending up at the bottom of the relevant rankings. There is a significant need for improvement in two critical digital skills indicators: the number of information and communication technology (ICT) specialists and the number of ICT graduates. Strengthening these indicators is crucial as they are directly linked to the education and capacity of the domestic workforce to meet the growing labour market needs for skilled digital technology personnel. Greece lags its European partners in these areas, which is a source of concern for future labour market developments. The inability of domestic and foreign firms operating in Greece to find skilled labour is likely to force firms to move to other European countries where finding ICT specialists is easier. This would have serious negative consequences for the Greek economy, especially at a time when significant efforts are being made to attract foreign direct investment.

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Centre of Planning and Economic Research (KEPE)

1. See Greek National Productivity Board (2023), *Greek National Productivity Board Annual Report 2023,* KEPE Publishing, Athens, Greece.

1. Recent (macro-)economic developments

KEPE, *Greek Economic Outlook,* issue 53, 2024, pp. 5-13

1.1. Evolution of the main components of demand in the first nine months of 2023

1.1.1. Introduction – Domestic & external demand

Yannis Panagopoulos

In this section, making use of the existing recorded macroeconomic data, we proceed to analyze the current developments of the Greek economy after the elections of 2023. The first thing we observe, based on the results of Table 1.1.1 and Diagram 1.1.1, is mainly the continuation of the positive "conditions" of the economy, at the third quarter of 2023. Of course, the quarterly growth of the economy from Q2 to Q3 2023 (y-o-y) continued, but at a declining rate (from 2.6% to 2.1%, respectively). Also, on a nine-month basis, we had a picture of this decline in the growth rate of the economy. Thus, from a growth of 6.21% in the nine months of 2022, we moved to a lower growth of 2.2% in the corresponding nine-months of 2023.

Regarding the factors that contributed to the GDP growth in the first nine months of 2023 (2.2%), it should be noted that among the individual macroeconomic factors, the largest positive rate of change was shown by gross fixed capital formation (7.4%), followed, in order of magnitude, by exports of goods & services (2.4%), private consumption (1.3%) and public consumption (1.1%). For the same period, imports of goods & services, which are known to have a negative contribution to GDP, increased by 1.9%.

In terms of quarterly data –3rd quarter of 2023– we have approximately the same picture but with a different order of importance of the individual factors in the recorded GDP growth path. Specifically, gross fixed capital formation (4.9%) leads, as a percentage, followed by exports of goods and services (1.0%) and private consumption (0.9%), while public consumption (-0.7%) showed a negative change (Table 1.1.1.).

Domestic demand also shows a clearly positive but declining trend – from the 4th quarter of 2021 onwards (Diagram 1.1.2). Thus, in Q3 2023, we reach a domestic demand of 1.5% (using seasonally adjusted data), where the fixed capital investment (0.68) and the private consumption (0.66) are the positive components while the public consumption was the negative component (-0.14).

As regards now the comparative course of the external versus domestic demand sector in GDP (international vs. domestic demand, respectively), during the third quarter of 2023, the most significant positive role of domestic demand in the change in GDP (1.55) emerges. This positive role of domestic demand has been continuous since Q2 2021 and is the most significant of all (see Diagram 1.1.3). Also on the path of a positive contribution to GDP was the change in inventories while on a negative contribution path was the balance of goods and services (1.01 and -0.89, respectively, for Q3 2023).

The path of the Economic Sentiment Index (ESI), as a future "proxy" for aggregate demand, is known to provide, like some other leading indicators, important information for business and consumer behaviour. It is also an important leading indicator of the economy and can be used to forecast immediate developments concerning the future path of GDP growth. Diagram 1.1.4 shows the path of the ESI for the full year (2023).

From the recorded path of this Index, it is evident that there is a relatively stable course (trend) with a small "turning point". Specifically, the Index moved upward from 106 points in January 2023 to 111.3 points in August 2023, followed by a slight decline in December 2023 (106 points). Perhaps this "slight" retreat is related to the war in Gaza in early October, with the international economic repercussions this may had.

Balance of goods and services

The contribution of the external sector (exports minus imports) to GDP growth for the third quarter of 2023, as already mentioned above, is generally negative (-0.89 points) and rather reflects the positive but declining path of the country's economic growth, which, as shown in Table 1.1.1, started from the second quarter of 2022 (except for the first quarter of 2023).

TABLE 1.1.1 Basic macroeconomic variables

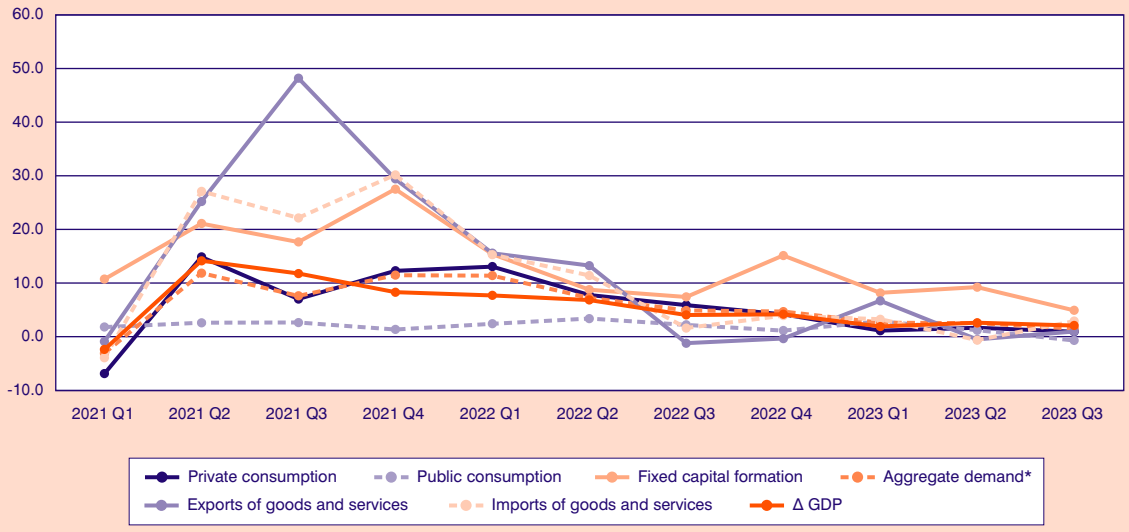
(seasonally adjusted data)

	2021 Q1	2021 Q2	2021 Q3	2021 Q4	2022 Q1	2022 Q2	2022 Q3	2022 Q4	2023 Q1	2023 Q2	2023 Q3	9 months 2022	9 months 2023
Private consumption	-6,9	14,9	7,0	12,3	13,1	7,8	5,9	4,2	1,1	1,7	0,9	8,92	1,3
Public consumption	1,8	2,6	2,6	1,4	2,4	3,4	2,2	1,2	2,9	1,2	-0,7	2,68	1,1
Fixed capital formation	10,7	21,1	17,7	27,5	15,4	8,8	7,4	15,1	8,2	9,2	4,9	10,54	7,4
Aggregate demand*	-3,1	11,9	7,6	11,5	11,4	7,3	4,9	4,7	2,6	2,6	1,5	7,85	2,2
Exports of goods and services	-0,9	25,2	48,2	29,4	15,6	13,3	-1,2	-0,3	6,7	-0,5	1,0	9,21	2,4
Goods	11,2	22,0	14,9	9,2	6,2	4,7	2,9	0,8	10,9	-0,7	-1,1	4,59	3,0
Services	-19,2	58,1	93,6	62,2	23,1	25,2	-1,5	-3,6	5,2	-0,2	2,9	15,61	2,6
Imports of goods and services	-3,9	27,1	22,2	30,2	15,3	11,4	1,6	3,9	3,3	-0,6	2,9	9,45	1,9
Goods	-0,6	26,9	17,0	26,7	15,7	13,2	4,7	2,0	0,8	-2,6	3,4	11,20	0,5
Services	-13,9	26,9	37,8	41,4	12,3	4,1	-8,5	8,0	10,9	5,5	0,8	2,64	5,7
Δ GDP	-2,4	14,2	11,8	8,3	7,7	6,9	4,1	4,2	1,9	2,6	2,1	6,21	2,2

Source: National Accounts, ELSTAT.

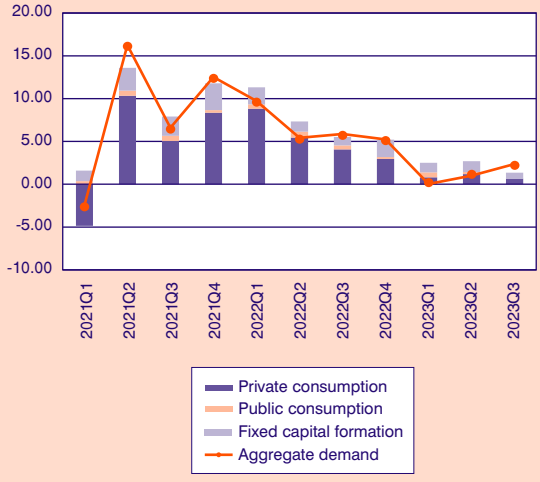
* Without change of Inventories.

DIAGRAM 1.1.1
Basic macroeconomic variables
(seasonally adjusted data)



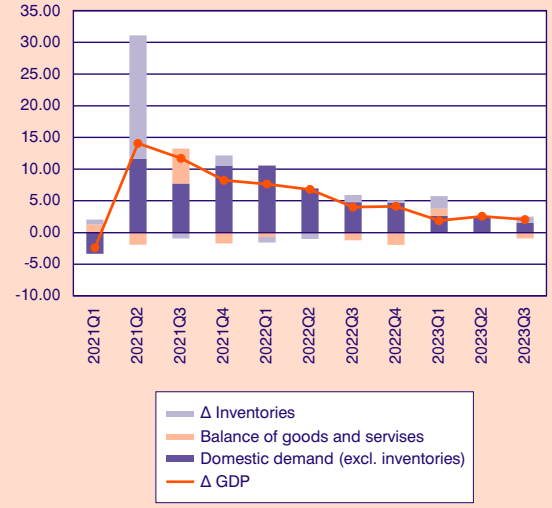
Source: National Accounts, ELSTAT.
* Without change of inventories.

DIAGRAM 1.1.2
Sub-components of domestic demand



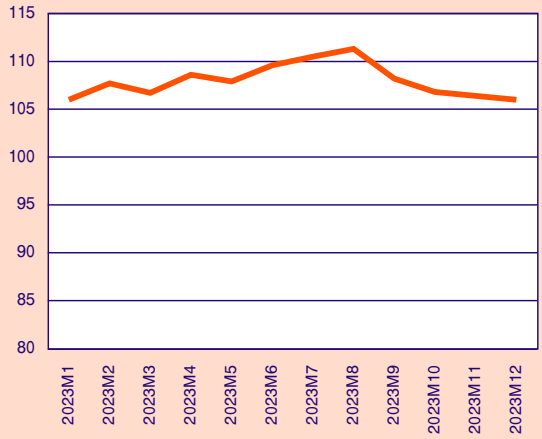
Source: National Accounts, ELSTAT, data processing by the author.

DIAGRAM 1.1.3
Domestic and net external demand



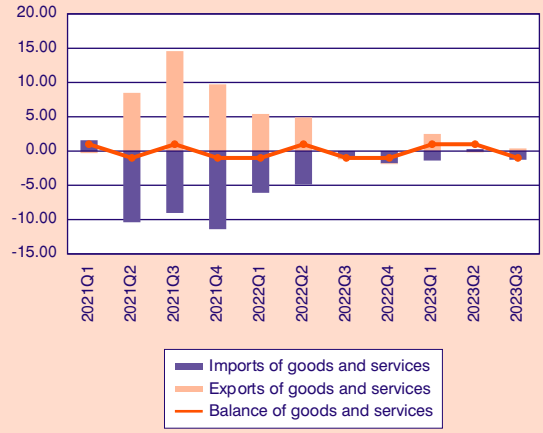
Source: National Accounts, ELSTAT, data processing by the author.

DIAGRAM 1.1.4
Economic Sentiment Index (1/2022-8/2023)



Source: Eurostat.

DIAGRAM 1.1.5
Sub-components of external demand



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

Starting with total exports, we should underline that they increased slightly, in Q3 2023, at a rate of 1.0%. More specifically, services, which are the relatively smaller part of exports in billions of euros, showed an increase of 2.9%, while goods, which were the largest part of exports, showed a decrease of -1.1% for the same period. As far as imports of goods and services are concerned, in contrast to the structure of exports, they are more balanced in terms of distribution, and we can say that they recorded an increase of 2.9%. More specifically, imported services showed an increase of 0.8% while, on the other hand, in imported goods, we had a quarterly increase of 3.4%.

In fact, as can be seen from the histograms in Diagram 1.1.5, after the second quarter of 2022 and until the third quarter of 2023, there has been a gradual decline in the importance, as an absolute value, of both components (imports and exports) in GDP. The same is observed, in the same period, but with alternating signs, for their net contribution to GDP. Finally, for Q3 2023, the net contribution of the external sector to GDP appeared with a negative sign (-0.83), in contrast to the positive sign in the two previous quarters of the same year.

1.1.2. Private consumption and investment

Konstantinos Loizos

1.1.2.1. Private consumption

Fluctuations in private consumption expenditure during the first nine months of 2023

According to the quarterly seasonally adjusted National Accounts,[1] the private consumption of households and NPISH[2] increased from 37,019 million euros in current prices in the first quarter of 2023 to 37,482 million euros in the second quarter and 37,562 million euros in the third quarter of the same year. On the contrary, in terms of chain-linked volumes with 2015 as a reference year, private consumption rose from 33,858 million euros in the first quarter to 34,005 million euros in the second quarter of 2023, but it fell to 33,775 million euros in the third quarter of that year. In terms of percentage changes[3] with respect to the preceding quarter, based on seasonally adjusted chain-linked volumes, private consumption exhibited positive and rising rates in the first two quarters (1.1% in the first quarter of 2023 and 1.7% in the second quarter) but a lower positive percentage rate of change 0.9% in the third quarter. The

1. *Quarterly National Accounts,* Press release, ELSTAT, December 6, 2023.
2. Non-profit institutions serving households.
3. Percentage changes are calculated using the formula $\frac{X_t - X_{t-1}}{X_{t-1}}$.

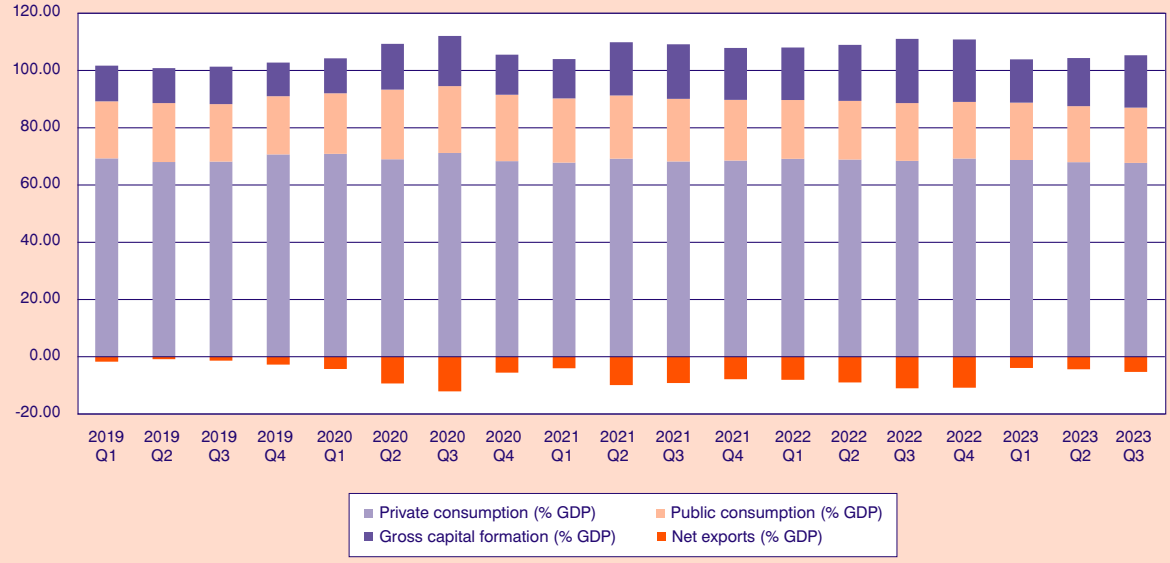
same rates of change with respect to the corresponding quarter of the previous year were -0.3%, 0.4% and -0.7%, indicating a similar pattern of rising and falling rates, although, in this case, the first and third quarters are characterized by negative figures.

Private consumption as a percentage of GDP was 68.16% on average during the first nine months of 2023, lower than its average value in 2022 (68.94%), while public consumption was 19.64% of the total expenditure (20.24% of GDP in 2022). On the other hand, gross capital formation (fixed capital and changes in inventories) during the first nine months of 2023 accounted, on average, for 16.73% of GDP, lower than its average value in 2022 (20.54% of GDP). Moreover, the deficit in the balance of trade declined on average as a percentage of GDP from -9.72% in 2022 to -4.53% in the first nine months of 2023. Therefore, during the first nine months of 2023, private consumption expenditure rose in current prices but fell in the third quarter in terms of chain-linked volumes. In addition, its share in GDP seems to be somewhat lower on average during the first nine months of 2023 with respect to its average value in 2022, while the same holds true as far as public consumption and gross investment are concerned. Only the deficit in the balance of trade as a percentage of GDP improved significantly on average during the first nine months of 2023, as depicted in Figure 1.1.6. The falling share in GDP of investment expenditure and public consumption is reflected in the lower level of the balance of the trade deficit, while it is noteworthy that the share of consumption expenditure in GDP has generally maintained its high level.

Negative percentage changes on average in retail trade, with food items being the driving factor

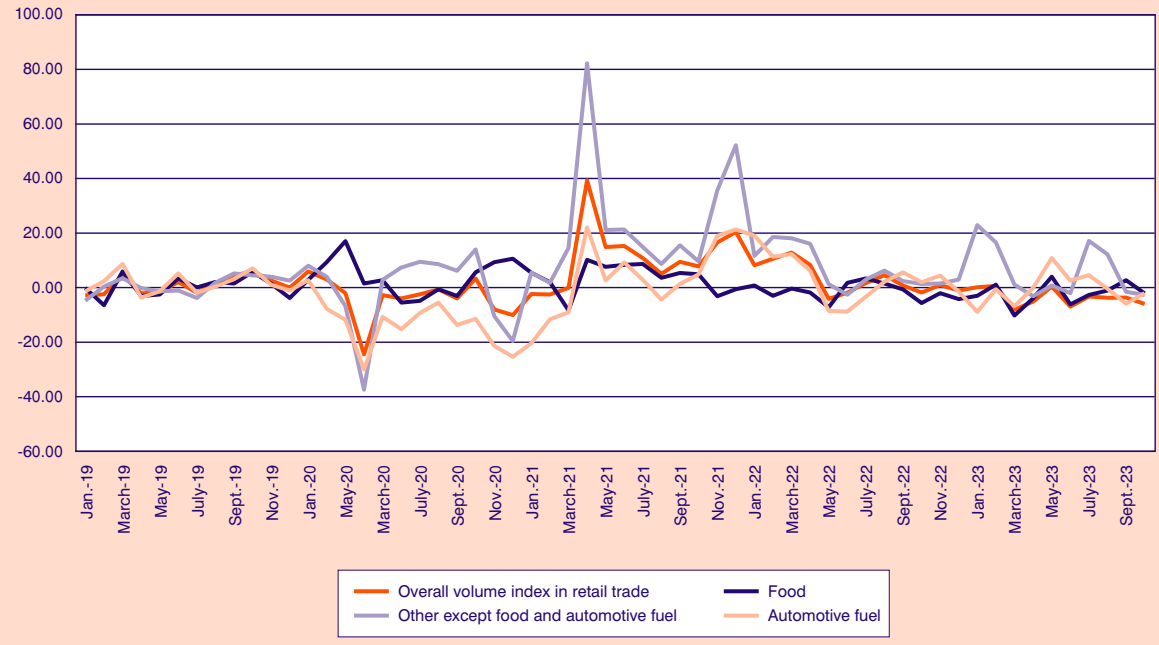
The evolution of retail trade in terms of percentage changes of the overall volume index was negative on average during the first nine months of 2023 with respect to the corresponding months of the previous year, with a value of -3.6% based on ELSTAT monthly data, as depicted in Figure 1.1.7. The corresponding quarterly average percentage changes were all negative, equalling -2.49% in the first quarter, -3.92% in the second quarter and -3.54% in the third quarter. We observe the same trend in food items with an negative average percentage change of -2.13% in the first nine months of 2023 and the corresponding quarters (-4.04%, -2.03% and -0.34% for the first, second and third quarter). Things are different for automotive fuel, with a small negative average percentage change of -0.69% in the first nine months. Concerning the first three of quarters of 2023, a negative average percent-

FIGURE 1.1.6
Evolution of private consumption and other components of demand as a percentage of GDP
(expenditure approach) (seasonally adjusted data in current prices)



Source: ELSTAT, data processing by the author.

FIGURE 1.1.7
Percentage changes in the seasonally adjusted overall volume index and the main sector indices in retail trade



Source: ELSTAT, data processing by the author.

age change of -5.43% in the first quarter turns into a positive one of 4.42% in the second quarter, but it reverts to a negative value of -0.59% in the third quarter. In other items except food and automotive fuel, the evolution of percentage changes presents the opposite pattern than the one observed for automotive fuel since the average percentage change in the nine–month interval was positive and equal to 6.11% with positive percentage changes during the first and third quarter (13.51% and 9.24%) but a negative one in the second quarter (-1.50%). Therefore, retail trade, in terms of the overall volume index, exhibited negative trends in the first nine months of 2023 excluding other items except food and automotive fuel.

Fluctuation of expectations in retail trade

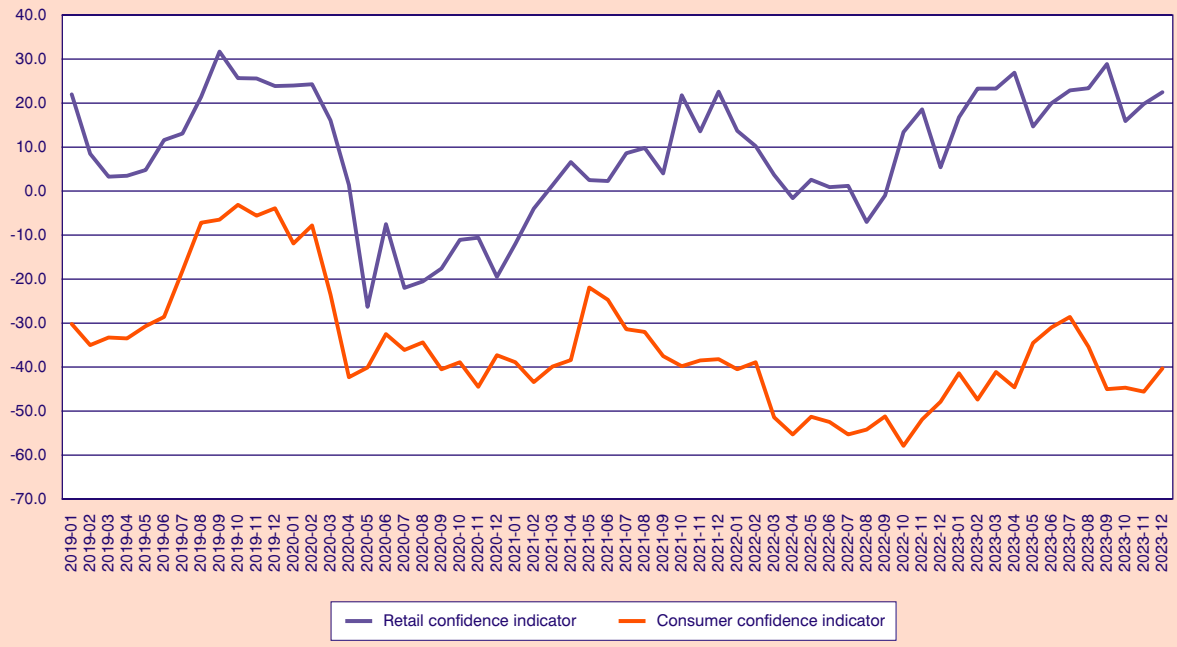
Confidence indicators published by Eurostat, as depicted in Figure 1.1.8, corroborate the fluctuation of both indices of expectations that reflect the mood in retail trade during the first nine months of 2023. Therefore, the data indicates that the optimism which started during the third and fourth quarters of 2022 does not seem to persist, at least as far as the consumer confidence indicator is concerned. On the other hand, the fluctuation which we observe in the retail confidence indicator is particularly intense.

1.1.2.2. Investment

Unclear developments in gross investment

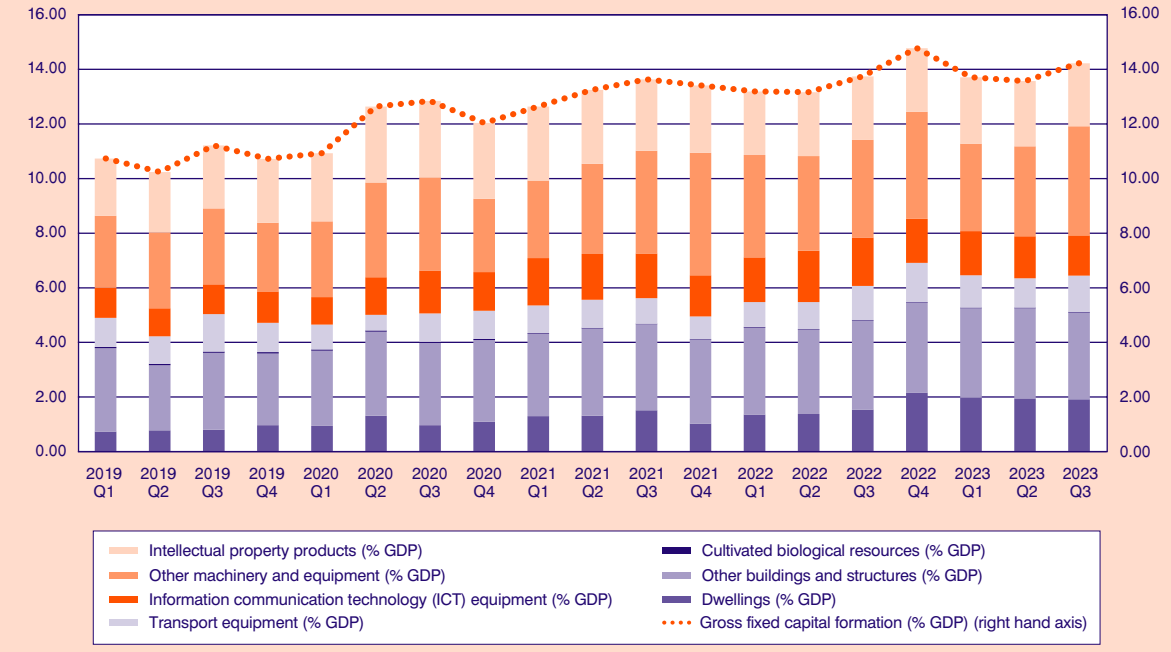
Gross fixed capital formation increased from 7,379 million euros in current prices in the first quarter of 2023 to 7,478 million euros in the second quarter and 7,888 million euros in the third quarter of the year. Nevertheless, in terms of chain-linked volumes, we observe a fall in the respective figures since gross fixed capital formation declined from 7,104 million euros in the first quarter of 2023 to 7,084 million euros in the second quarter and 6,954 million euros in the third quarter of 2023. On the other hand, in terms of percentage changes with respect to the corresponding quarter of the preceding year, we observe positive but fluctuating rates of the magnitude of 8.2% in the first quarter, 9.2% in the second quarter and 4.9% in the third quarter. Regarding the percentage changes with respect to the preceding quarter, there are negative values in all quarters, namely, -0.3% in the first and second quarter but -1.8% in the third quarter of 2023, according to the seasonally adjusted chain-linked volumes.

FIGURE 1.1.8
Confidence indicators in retail trade



Source: Eurostat, data processing by the author.

FIGURE 1.1.9
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.

The evolution of investment (gross fixed capital formation) as a percentage of GDP (Figure 1.1.9) exhibited a rebound, with a percentage change of 4.81% in the third quarter of 2023, despite its falling trend during the first two quarters of 2023, with rates of percentage changes with respect to the previous quarter of -7.21% in the first quarter and -1.02% in the second. In terms of the main components of gross investment, the same pattern repeats itself in the case of machinery and transport equipment as a percentage of GDP with negative percentage changes of -14.02% in the first quarter of 2023 and -1.59% in the second quarter of the same year but a positive percentage change 15.01% in the third quarter of that year. To the contrary, buildings (both dwellings and other buildings and structures) as a percentage of GDP maintained negative percentage changes in all quarters, namely, -3.52% in the first quarter, -0.03% in the second quarter and -2.96% in the third quarter of 2023. The explanation behind the decline in the share of investment in GDP can be found in the data presented in Figure 1.1.6 above, since it is followed by a fall in the external deficit and, therefore, a decline in domestic expenditure. Nevertheless, we cannot help but observe the recovery of gross investment expenditure as a percentage of GDP in the third quarter of 2023, although the corresponding percentage rates of change in sheer amounts indicate a fall. The conclusion is that during the first nine months of 2023, the evolution of gross investment is rather unclear since the latter rises in nominal terms and, at the same time, falls in terms of chain-linked volumes while the relevant percentage changes in both absolute terms and as percentage of GDP manifest fluctuations.

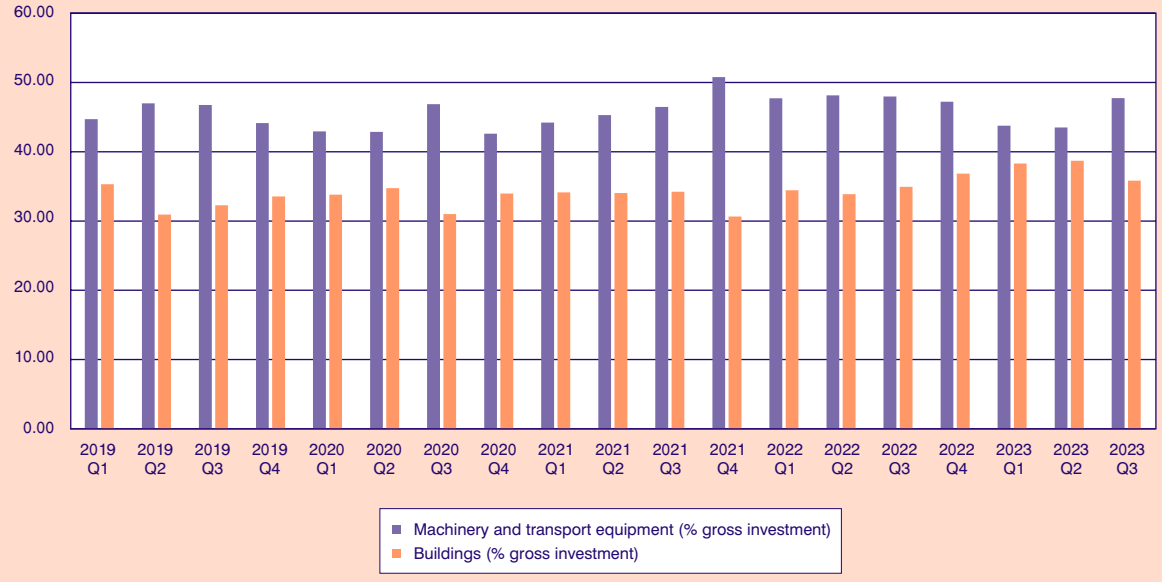
Fall in the share of buildings in gross investment in favour of machinery and transport equipment

According to Figure 1.1.10, the share of buildings in gross investment fell for the first time after four quarters of continuous rise against the share of machinery and transport equipment in total gross fixed capital formation. Consequently, the share of buildings in gross investment declined from 38.70% in the second quarter of 2023 to 35.83% in the third quarter of the same year while the corresponding percentages for machinery and transport equipment were 43.51% and 47.74%, respectively. It remains to be seen in the future whether this fall in the share of buildings against machinery and transport equipment as percentages of gross investment is a temporary and short-lived development.

Recovery of optimism in the construction sector

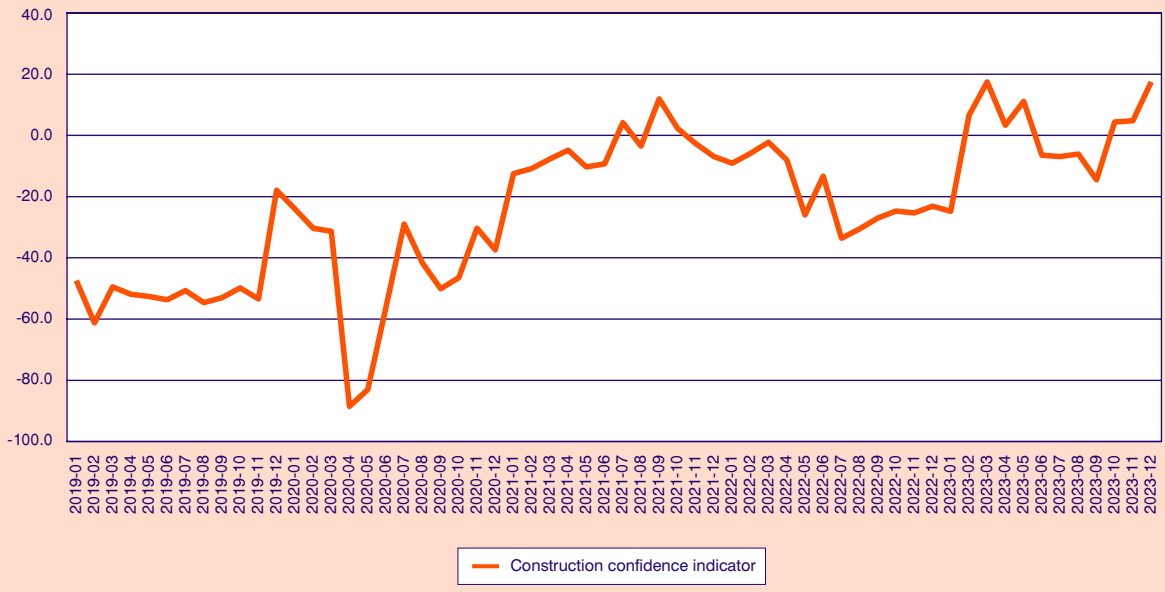
The evolution of business expectations in the construction sector seems to be characterized by a new

FIGURE 1.1.10
Machinery, transport equipment and buildings as a percentage of gross fixed capital formation



Source: ELSTAT, data processing by the author.

FIGURE 1.1.11
Construction confidence indicator



Source: Eurostat, data processing by the author.

recovery after September 2023, despite its falling trend until that date, which was related to the uncertainty of the parliamentary elections period. From this point of view, our observation, expressed in the previous issue of *Greek Economic Outlook,* that the fall in the relevant confidence indicator during the interval April – August 2023 may not be an indication of structural change in the general business mood, seems to be confirmed by the data.

1.1.2.3. Conclusions

The above analysis seems to indicate that the Greek economy during the first nine months of 2023, which included the successive elections of May and June 2023, was characterized by fluctuations in private consumption and unclear developments in gross investment. Moreover, percentage changes in the overall volume index in retail trade were negative, driven by the evolution in food items, while confidence indicators seem to recover in construction, but their trend is unclear in retail trade. The uncertainty provoked by the electoral period and the ongoing inflation, especially in food items, seem to be responsible for these developments in the first nine months of 2023. However, a positive tone to the above is given by the decline in the balance of the trade deficit, which is also responsible for the fall in the share of private consumption but mostly of public consumption and gross investment in GDP.

1.2. Food, Hotels-Cafés-Restaurants and Health shape January 2024 inflation despite falling electricity and natural gas prices

Emilia Marsellou

Introduction

Headline inflation in Greece in January 2024 reached 3.1%, down from 3.5% in December 2023. Core[1] inflation reached 3.2% in January 2024, slightly higher than the 3.1% of December 2023. Inflation in January was mainly fueled by rising Food prices which had by far the largest positive contribution (1.8 percentage points), corresponding to 58.3% of the increase in the General Index, followed by Hotels-Cafés-Restaurants with a contribution 0.7 pp and Health with 0.4 pp. On the contrary, inflation was held back by the significant negative contribution of the Housing group (-0.38 percentage points) due to the fall in the prices of the Energy group, especially that of natural gas, which was partially offset by the increase in the rentals for dwellings.

In the euro area, based on Eurostat's flash estimates, inflation in January 2024 reached 2.8%, slightly lower than the 2.9% of December. Core inflation reached 3.3%, down from 3.4% in December. The Food, Alcohol and Tobacco group recorded the highest inflation (5.7%), followed by Services (4.0%) and Non-energy industrial goods (2.0%), while the Energy group recorded a negative rate (-6.3%).

1.2.1. Greece

Based on monthly data, the National CPI in January 2024 recorded an annual increase of 3.1% compared to 3.5% in December 2023. Core inflation was also approximately at the same levels, with the CPI recording an increase of 3.2% against 3.1% in January and December, respectively. On a monthly basis, the National CPI decreased by -0.8% m-o-m in January. Similarly, in January 2024, inflation based on HICP stood at 3.2% and the corresponding core at 3.1%.

The largest contribution to the annual percentage increase of the National CPI in January 2024 was from the group Food and non-alcoholic beverages with 1.8 percentage points, followed by Hotels-Cafés-Restaurants with 0.7 pp and Health with 0.4 pp. The Housing group contained inflation with a negative contribution of -0.38 pp due to the significant reduction in the prices of electricity and especially the natural gas prices, partially offset by the increase in housing rents.

More specifically, the annual increase of the National CPI in January 2024 by 3.1% is a combined result of the following changes in the price indices of the subgroups of goods and services. More specifically, increases were recorded by:

- 8.3% in the group Food and non-alcoholic beverages. This increase is mainly attributed to the rise in the prices of bread and cereals (2.0%), meat (6.0%), fish (7.7%), milk-cheese and eggs (0.9%), olive oil (67.4%), fruit (14.2%), vegetables (14.4%), sugar-chocolates-sweets-ice creams (6.0%), food n.e.c. (5.8%), coffee-cocoa-tea (5.0%) and mineral water-refreshments-fruit juices (11.7%).
- 2.6% in the group Alcoholic beverages and tobacco. This increase is mainly attributed to the rise in the prices of (not served) alcoholic beverages (6.0%).
- 3.5% in the group Clothing and footwear. This increase is mainly attributed to the rise in the prices of clothing and footwear (3.5%).
- 1.9% in the group Household equipment. This increase is mainly attributed to the rise in the prices of non-durable household articles (3.4%).
- 5.7% in the group Health. This increase is mainly attributed to the rise in the prices of pharmaceutical products (12.7%), medical-dental and paramedical services (5.3%) and hospital care (0.9%).
- 0.2% in the group Transport. This increase, which is mainly attributed to the rise in the prices of new motor cars (0.5%), secondhand motor cars (4.6%), spare parts and accessories for motor cars (5,0%), maintenance and repair of motor cars-motor cycles

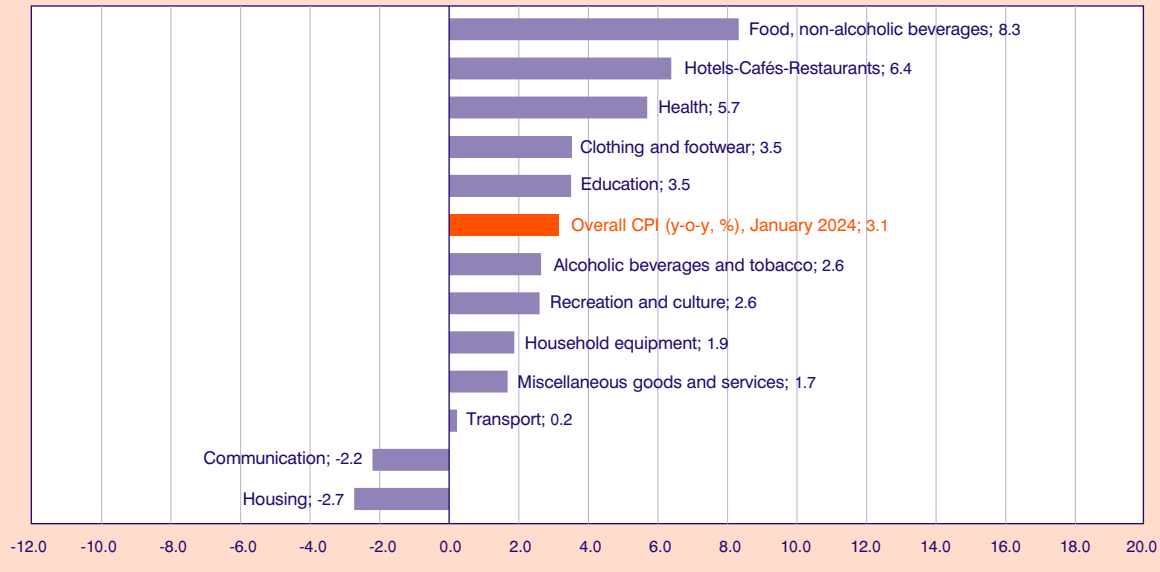
1. The Core Inflation Index is calculated from the Overall Consumer Price Index excluding the divisions of Food and non-alcoholic beverages, Alcoholic beverages and tobacco and Energy prices.

TABLE 1.2.1 Inflation in Greece (%)

	National CPI	CPI (m-o-m, %)	Headline inflation CPI (y-o-y, %)	Core inflation (y-o-y, %)	Harmonized inflation (y-o-y, %)	Core HICP (y-o-y, %)
2023M01	112.0	-0.5	7.0	6.0	7.3	6.5
2023M02	112.3	0.3	6.1	6.6	6.5	6.8
2023M03	113.7	1.2	4.6	6.7	5.4	7.0
2023M04	114.5	0.6	3.0	6.1	4.5	7.2
2023M05	114.9	0.4	2.8	6.7	4.1	7.3
2023M06	115.6	0.6	1.8	4.9	2.8	4.8
2023M07	114.3	-1.1	2.5	5.4	3.5	5.4
2023M08	114.3	0.0	2.7	5.3	3.5	5.4
2023M09	116.3	1.8	1.6	3.9	2.4	4.2
2023M10	117.0	0.6	3.4	3.5	3.8	3.6
2023M11	116.6	-0.4	3.0	3.3	2.9	2.8
2023M12	116.5	-0.1	3.5	3.1	3.7	3.3
2024M01	**115.5**	**-0.8**	**3.1**	**3.2**	**3.2**	**3.1**

Source: ELSTAT, Eurostat.

FIGURE 1.2.1
Annual % changes in National CPI sub-categories (January 2024)



Source: ELSTAT.

TABLE 1.2.2 Annual % changes in National CPI sub-categories, January 2023 – January 2024

	2023												2024
Groups of goods and services	**Jan.**	**Feb.**	**Mar.**	**Apr.**	**May**	**June**	**July**	**Aug.**	**Sept.**	**Oct.**	**Nov.**	**Dec.**	**Jan.**
1 Food, non-alcoholic beverages	15.4	14.8	14.3	11.4	11.6	12.2	12.3	10.7	9.4	9.9	9.0	8.9	8.3
2 Alcoholic goods and tobacco	3.0	2.9	3.7	4.0	3.5	3.4	3.4	3.2	2.5	2.6	2.6	2.2	2.6
3 Clothing and footwear	6.5	7.1	14.4	5.6	11.8	5.9	5.2	6.9	6.2	3.3	6.4	2.8	3.5
4 Housing	-0.1	-4.9	-10.4	-13.4	-12.9	-11.7	-11.8	-12.6	-15.0	-2.0	-1.2	-0.5	-2.7
5 Household equipment	10.6	10.5	11.0	10.9	9.9	7.6	6.4	5.6	3.7	2.8	1.5	1.9	1.9
6 Health	2.9	5.3	5.6	6.5	7.8	7.7	7.8	5.9	5.6	5.6	5.5	5.5	5.7
7 Transport	8.1	6.5	1.9	1.4	-3.1	-7.6	-3.7	1.6	3.0	-0.4	-2.7	0.3	0.2
8 Communication	-1.3	-1.6	-1.9	-1.8	-2.3	-2.7	-2.8	-3.1	-3.1	-3.2	-3.2	-3.2	-2.2
9 Recreation and culture	3.4	3.5	2.9	3.7	3.3	3.6	3.5	3.3	3.1	3.1	2.8	2.6	2.6
10 Education	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	3.0	3.5	3.5	3.5	3.5
11 Hotel-Cafés-Restaurants	7.8	8.1	7.5	8.5	7.4	6.3	6.2	6.1	4.8	4.8	4.7	5.9	6.4
12 Miscellaneous goods & services	5.4	5.8	6.2	6.4	6.8	4.2	3.6	3.9	2.4	2.7	1.9	1.7	1.7
General Index	7.0	6.1	4.6	3.0	2.8	1.8	2.5	2.7	1.6	3.4	3.0	3.5	3.1

Source: ELSTAT.

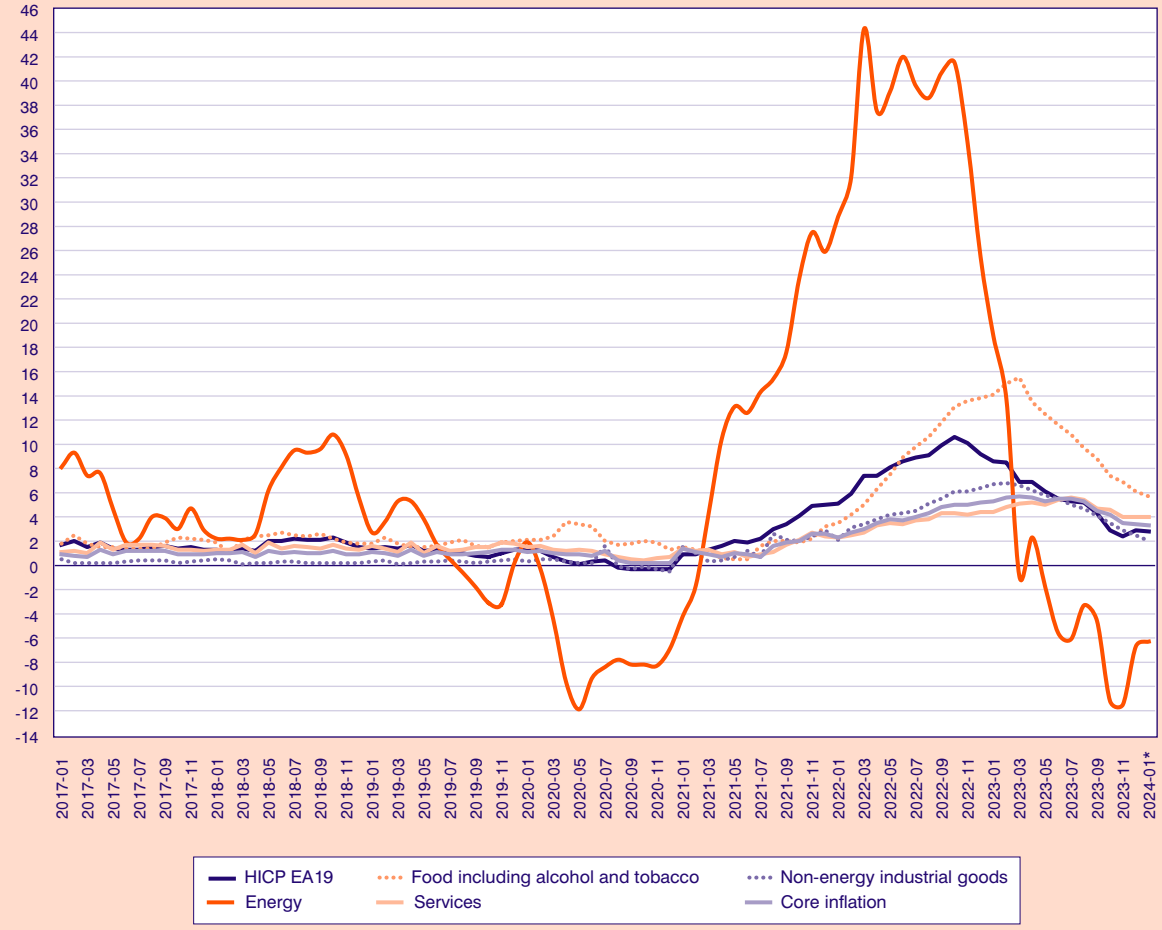
(4.0%) and tickets for passenger transport by air (11.5%), was partly offset by the decrease in the prices of fuels and lubricants (-3.8%).

- 2.6% in the group Recreation and culture. This increase, which is mainly attributed to the rise in the prices of major durables for recreation (3.1%), small recreational items-flowers-pets (5.1%), cinemas-theatres (7.9%) and package holidays (9.3%), was partly offset by the decrease in the prices of equipment for audiovisual and information processing equipment (-1.7%).
- 3.5% in the group Education. This increase is mainly attributed to the rise in the prices of fees of pre-primary and primary education (4.0%), fees of secondary education (3.6%) and fees of tertiary education (2.8%).
- 6.4% in the group Hotel-Cafés-Restaurants. This increase is mainly attributed to the rise in the prices of restaurants-confectioneries-cafés-buffets (6.8%).
- 1.7% in the group Miscellaneous goods and services. This increase, which is mainly attributed to the rise in the prices of hairdressing salons and personal grooming establishments (3.3%), private insurance connected with health (14.0%) and motor vehicle insurance (2.1%), was partly offset by the decrease in the prices of other appliances and articles for personal care (-1.2%).

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

- -2.7% in the group Housing. This decrease, which is mainly attributed to the fall in the prices of natural

FIGURE 1.2.2
HICP in the euro area, monthly data, annual % change



Source: Eurostat.

*Flash Estimates.

gas (-60.2%) and electricity (-0.4%), was partly offset by the increase in the prices of rentals for dwellings (3.6%), services for the repair and maintenance of the dwelling (2.4%), heating oil (1.3%) and solid fuels (8.6%).

- -2.2% in the group Communication. This decrease is mainly attributed to the fall in the prices of telephone services (-2.5%).

1.2.2. The euro area

According to Eurostat's flash estimates, in January 2024, inflation in the euro area reached 2.8% against 2.9% in December 2023. The core inflation in January reached 3.3%, down from 3.4% and 3.5% in December and November 2023, respectively.

The highest annual rate of HICP in the euro area is still recorded in the Food sector (5.7%), followed by the group of Services (4.0%), and the group of Non-energy industrial products (2.0%). On the contrary, the prices in the Energy group fell by -6.3%.

Among the euro area countries, the highest inflation was recorded in Estonia (5.0%), Croatia (4.8%) and Austria (4.3%), while the lowest inflation was recorded in Finland (0.7%), Italy (0.9%) and Lithuania (1.0%). Cyprus (2.0%), Belgium (1.5%), Latvia (1.0%), Lithuania (1.0%), Italy (0.9%) and Finland (0.7%) remain lower or egual to the ECB's inflation target of 2.0% for the second consecutive month.

1.3. Factor model forecasts for the short-term prospects in GDP

Factor Model Economic Forecasting Unit
Ersi Athanassiou, Aristotelis Koutroulis, Emilia Marsellou, Theodore Tsekeris

The current section presents the forecasts of KEPE concerning the evolution of the rate of change of real GDP in Greece in the fourth quarter of 2023 and in year 2024.[1] The forecast is conducted using 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 period from the first quarter of 2000 up to the third quarter of 2023.

According to the revised provisional data of the quarterly *National Accounts,* in the first and second quarters of 2023, the rate of change of the Greek economy's GDP reached 1.9% and 2.6%, respectively, on an annual basis, while in the third quarter of the year, the country grew at a rate of 2.1%. These rates were among the highest among EU member-countries, the majority of which recorded weak or even negative growth, having been affected significantly by the increased cost of living, continued pressures on the prices of basic goods, the gradual withdrawal of fiscal support measures, the lack of impetus from the side of international demand, high interest rates and inflated production costs. In the case of Greece, these factors have a visible imprint on the course of several important economic variables, with the overall growth rate of the economy showing, however, remarkable resilience, finding support in the rise in investment, the increase in employment and the upward trend of demand in key sectors such as tourism and construction.

As in the year 2023, in the year 2024, the EU economy is confronted with significant challenges in relation to inflation and interest rates, while, at the same time, geopolitical tensions and the climate crisis continue to pose serious risks. According to the estimates so far, the return of inflation to desirable levels is expected to be delayed, and therefore pressures on household purchasing power will continue, while any de-escalation in interest rates will be gradual. At the same time, new significant uncertainties and risks arise due to the crisis in the Middle East, which affects, among others, the prospects of international trade, the smooth functioning of value chains and transport costs. On the other hand, recent forecasts for the course of the European economy in the year 2024 point in the direction of a mild strengthening of the average growth rate in the EU, a prospect which favors the Greek economy, and may contribute to the recovery of Greek exports of goods. Moreover, although at the present time Greece is significantly affected by the uncertainties and instability in the international environment, the country continues to show a positive outlook in key sectors of activity (e.g., construction, tourism), while it also has at its disposal important tools for maintaining a consistently positive course. The expected inflow of significant financial resources through the Recovery and Resilience Facility within the year and the recent upgrade of the country's credit rating present major opportunities for strengthening investment and improving the outlook in key sectors of the economy.

The volatile conditions in terms of international developments, as well as the uncertainties regarding the economic impact of the extreme natural phenomena that Greece faced last year, raise the difficulty of forecasting the course of real GDP in subsequent quarters. Having noted this reservation, Table 1.3.1. presents the econometric estimates for the rate of change of Greece's GDP up to the fourth quarter of year 2024.

According to estimates for 2023, a growth rate of 2.2% is forecasted both for the fourth quarter of the year and for the annual average of year 2023 as a whole. It is noted that the current estimate for the annual average growth rate is slightly lower compared to the corresponding previous forecast of KEPE (2.4%), a

1. The date of the forecast is January 19, 2024.

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.

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

	2023	2024			
Quarters	**2023Q4**	**2024Q1**	**2024Q2**	**2024Q3**	**2024Q4**
Quarterly rate of change	2.20 [2.03 , 2.37]	3.36 [3.04 , 3.68]	1.78 [1.33 , 2.22]	2.05 [1.49 , 2.62]	1.45 [0.94 , 1.96]
Mean rate of change, 1st half *	-	2.57 [2.19 , 2.95]		-	
Mean rate of change, 2nd half **	2.14 [2.06 , 2.23]	-		1.75 [1.21 , 2.29]	
Mean annual rate of change ***	**2.20** [2.16 , 2.25]		**2.16** [1.70 , 2.62]		

Notes: * The mean rate of change is not reported for the 1st half of 2023, since it does not incorporate a forecast. ** The mean rate of change for the 2nd half of 2023 incorporates the officially available (provisional) data for the 3rd quarter of 2023, on a seasonally adjusted basis. *** The mean annual rate of change for 2023 incorporates the officially available (provisional) data for the first three quarters of 2023, on a seasonally adjusted basis.

modification reflecting a small downward revision of ELSTAT's[4] provisional figures for the growth rate of GDP in the first half of the year.

Moving into the year 2024, quarterly forecasts continue to show a positive sign, with GDP growth estimated at 2.6% for the first half and 1.8% for the second half of the year. For the year 2024 as a whole, the forecast for the average annual growth rate of the Greek economy stands at 2.2%, an estimate according to which the country is expected to remain on an upward trajectory, maintaining a satisfactory GDP growth momentum. This outlook stems from the favourable development of several of the economic figures included in the forecast, in combination with the visible impact of the conditions mentioned above on the course of certain important variables.

More specifically, for the third quarter of 2023, the quarterly data of the National Accounts at constant prices compared to the corresponding quarter of 2022, show an increase in private consumption and a strengthening of fixed capital investment, along with a slowdown in their rates of change compared to previous quarters. At the same time, the data reflect, on the one hand, a decline in general government consumption, which is consistent with the gradual return of fiscal policy to normality, and, on the other hand, mixed trends regarding the course of external demand. Specifically, while exports of services increased, due to the significant strengthening of tourism receipts, exports of goods came under pressure, due to the weakening of the economic environment in Europe.

Regarding the course of indicators reflecting the activity of key sectors of the economy, developments varied considerably from case to case. First, in the industry sector, the overall industrial production index registered a marginal decline compared to the corresponding quarter of 2022, as the rise in the categories of *durable* and *non-durable consumer goods* was offset by a decline in the categories of *energy* and *intermediate* and *capital* goods. At the same time, the turnover index in industry registered a significant decrease, with this development being, however, partly due to the de-escalation of the prices of energy products. In the retail trade sector, the volume index showed a decline in six of the eight relevant subcategories, with the exceptions being *department stores* and *food-beverages-tobacco*, while a downward trend was also recorded in the turnover index in wholesale trade. On the other hand, a significant boost was observed for yet another quarter in travel receipts, which increased by 9.5% compared to the corresponding quarter of the previous year, while developments were also favourable with regard to the production index in construction and the relevant two sub-indices referring to *building construction* and *civil engineering*. Concerning the course of the domestic labour market, in the third quarter of 2023, a further improvement in conditions

4. According to the most recent ELSTAT *Quarterly National Accounts* publication, dated December 6, 2023.

was observed, as the number of persons employed increased by 1.0% compared to the third quarter of the previous year and the number of unemployed persons decreased by 7.4%, respectively.

With respect to price data for the third quarter of 2023, developments were indicative of a relative stability in energy costs, with the European harmonized energy price index for Greece remaining roughly at the same level compared to the preceding quarter. In addition, a further small improvement was recorded in relation to average inflation, with inflationary pressures remaining, however, high in key categories of consumer goods and services, such as *food and beverages*, *hotels-cafés-restaurants* and *health services*. In terms of the yield of Greece's ten-year government bond, which is linked to the levels of uncertainty in the economy, no noticeable change was observed in relation to the second quarter of 2023, with the spread against the corresponding German bond showing, at the same time, visible improvement. In relation to the indicators reflecting agents' expectations and assessments regarding the economic climate in the country, developments in the third quarter of 2023, compared to the second quarter of the year, demonstrate a strengthening of the economic climate in Greece, a further deterioration of the economic climate in Europe and a rise in business expectations in Greece in the retail trade sector.

Based on the risks highlighted above, which mainly concern geopolitical developments, inflation, interest rates, the impact of extreme weather phenomena caused by the climate crisis and the effects of the adjustment of fiscal policy, forecasts for the evolution of Greece's real GDP are subject to a significant degree of uncertainty. Nevertheless, the country presents at the moment significant potential to achieve a more favourable development of the GDP, making use of the opportunities arising from the recovery of investment grade and resources available through the Recovery and Resilience Facility and the new NSRF.

KEPE, *Greek Economic Outlook,* issue 53, 2024, pp. 22-27

1.4. Return to investment grade and high returns for the Greek stock market in 2023

Fotini Economou

1.4.1. Introduction

The return to investment grade and the good performance of the Greek economy contributed significantly to the positive performance of the Greek stock market for 2023, recording high positive returns and increased capitalization and transactions value compared to the previous year. In the same period, the bond market was affected by the successive interest rate hikes by the European Central Bank (ECB), increasing the cost of borrowing for the Greek government as well. Nevertheless, in the last months of 2023, bond yields saw a deceleration given the cessation of continuous interest rate hikes by the ECB and the recovery of investment grade for Greece. At the same time, the year 2023 ended with an excellent performance for the Greek institutional management sector, recording positive returns and increased assets and capital inflows.

After Greece's return to investment grade in 2023 by Rating and Investment Information (R&I), Scope Ratings, DBRS Morningstar, Standard & Poor's and, more recently, by Fitch (Table 1.4.1), the goal is to also achieve investment grade by the American rating agency Moody's. Note that the recovery of the investment grade has multiple benefits as it leads to reduced borrowing costs for the public and businesses, makes Greek stocks and bonds eligible for a much larger investor audience, and can positively contribute to the return of the Greek stock market in developed markets.

This article presents a brief overview of the course of the Greek stock market during the year 2023, focusing on key stock market indices and data. Additionally, the course of the bond market and the institutional management sector are presented for the year 2023. The final section of the article summarizes and concludes.

1.4.2. The course of the stock market in 2023

The year 2023 ended with impressive returns for the Greek stock market, with the Athex Composite Share Price Index achieving one of the highest returns internationally. More specifically, according to ATHEX data for 2023 (Table 1.4.2), the Athex Composite Share Price Index recorded a high positive return of 39.08%, reaching 1,293.14 points on 29/12/2023, from 929.79 points on 30/12/2022. The returns of the mid-cap and small-cap indices were also impressively high, with the FTSE/Athex Mid Cap Index and the Hellenic Mid & Small Cap Index outperforming the Athex Composite Share Price Index, registering an increase of 59.47% and 41.30%, respectively, while the Athex ESG Index and the FTSE/Athex Large Cap also moved close to the performance of the Athex Composite Share Price Index, at 39.15% and 38.70%, respectively.

TABLE 1.4.1 Greece's credit rating

Rating Agency	Rating	Outlook	Date of last review
Moody's	Ba1	Stable	September 2023
Fitch	BBB-	Stable	December 2023
Standard & Poor's	BBB-	Stable	October 2023
Rating and Investment (R&I)	BBB-	Stable	July 2023
DBRS Morningstar	BBB(Low)	Stable	September 2023
Scope Ratings	BBB-	Stable	August 2023

Source: Public Debt Management Agency (PDMA)-January 2024.

Impressively high returns were also recorded for the ATHEX sectoral indices, with the FTSE/ATHEX INDUSTRIALS index reaching 68.92% and the FTSE/ATHEX FINANCIAL SERVICES index and FTSE/Athex Banks index following, with returns of 66.29% and 65.73%, respectively. The only case of negative performance was the FTSE/ATHEX REAL ESTATE index, recording losses of -0.42%. It is worth noting the impressive course of the banking sector, the improved resilience of which is also confirmed by the upgrades of the systemic banks. [1]

According to ATHEX (2023) data, the market capitalization of the ATHEX (assets under custody of domestic and foreign investors in total listed equities with the participation of the Financial Stability Fund) reached €80.77 billion at the end of December 2023, recording a significant increase of 35% compared to the end of December 2022, which was €59.82 billion. The participation of foreign investors (with the participation of the Financial Stability Fund) remains high, reaching 64.37% at the end of December 2023, with foreign investors recording outflows of €17.63 million and 55.1% of total transactions in December 2023. The cash value of settled transactions of December 2023 reached €1,899.19 million, recording an increase of 64.7% compared to December 2022, which was at €1,152.80 million. Furthermore, the cash value of settled transactions of equities was increased in December 2023, reaching €1,865.44 million from €1,130.74 million in December 2022, also recording an increase for the whole year 2023, reaching €27,265.77 million from €17,975.38 million in 2022. Moreover, note that according to ATHEX data for the regulated market,[2] €896.5 million were raised in 2023 via share capital increases and €237.7 million via new listings in the main market, from €494.2 million and €114.2 million, respectively, in 2022.

TABLE 1.4.2 Prices and returns for selected indices of the ATHEX (29/12/2023)

	29/12/2023	Year min	Year max	Year change (%)
FTSE/Athex Mid Cap Index	2,250.81	1,411.43	2,253.56	59.47%
Hellenic Mid & Small Cap Index	1,929.00	1,365.14	2,011.62	41.30%
Athex ESG Index	1,471.77	1,057.52	1,541.00	39.15%
Athex Composite Share Price Index	1,293.14	929.79	1,351.68	39.08%
FTSE/Athex Large Cap	3,122.79	2,250.77	3,280.71	38.70%
Athex All Share Index	302.00	231.11	314.56	31.17%
FTSE/ATHEX INDUSTRIALS	5,081.43	4,480.19	14,456.49	68.92%
FTSE/ATHEX FINANCIAL SERVICES	5,014.23	4,054.88	13,100.99	66.29%
FTSE/Athex Banks	1,061.62	640.09	1,117.78	65.73%
FTSE/ATHEX CONSUMER DISCRETIONARY	5,015.77	4,812.63	11,591.73	41.71%
FTSE/ATHEX TECHNOLOGY & TELECOMMUNICATIONS	5,072.46	4,512.52	15,048.71	27.48%
FTSE/ATHEX CONSUMER STAPLES	5,088.44	4,557.73	5,642.34	25.28%
FTSE/ATHEX BASIC MATERIALS	4,869.63	4,131.69	17,078.41	24.24%
FTSE/ATHEX ENERGY & UTILITIES	4,987.63	4,162.64	9,803.86	20.31%
FTSE/ATHEX REAL ESTATE	4,960.50	4,558.45	8,268.86	-0.42%

Source: Daily official list of trading activity of the ATHEX 29/12/2023.

1. See S&P, December 14, 2023.

2. ATHEX Annual Publications 2023 and 2022, Capital Raised.

Examining the uncertainty about the short-term course of the market with the help of the KEPE GRIV Implied Volatility Index, the so-called "fear" index, a decrease in uncertainty was observed at the end of 2023 compared to the end of the previous year. The KEPE GRIV index reflects the uncertainty of the derivatives market participants about the expected short-term course of the Greek market and is calculated on the basis of the FTSE/Athex Large Cap options prices. The KEPE GRIV index decreased in December 2023, reaching 23.86% on 29/12/2023, from 26.68% on 30/11/2023. The index remained below its historical average level (since January 2004) for the Greek market, which stands at 32.34%. Moreover, the average daily value of the index decreased, reaching 25.34% in December 2023, from 30.22% in November 2023. The index decreased at the end of December 2023 compared to the end of December 2022, which was at 28.48%, reflecting the positive course of the Greek stock market, with fluctuations within the year.

1.4.3. Greek Government T-bills, Greek Government bonds and corporate bonds in 2023

During the year 2023, the bond market continued to come under pressure from the consecutive interest rate hikes by Central Banks, with the European Central Bank (ECB) carrying out its sixth consecutive increase in key interest rates for 2023 on 14 September 2023 (the tenth in a row since July 2022), with the aim of the timely return of inflation to the ECB's medium-term target of 2%.[3] In the subsequent two ECB meetings,[4] interest rates remained unchanged (main refinancing operations 4.50%, marginal lending facility 4.75% and deposit facility 4.00%), with inflation easing and the ECB considering that "the past interest rate increases continue to be transmitted forcefully to the economy". Note that during the last months of 2023, a de-escalation of bond yields was also observed, given the cessation of continuous interest rate increases by the ECB and the recovery of investment grade.

TABLE 1.4.3 Greek Government T-bill yields (issues from the end of 2022 to the end of 2023)

Auction date	13 weeks	Auction date	26 weeks	Auction date	52 weeks
1/11/2023	3.88%	27/12/2023	3.87%	6/12/2023	3.70%
4/10/2023	3.90%	29/11/2023	3.84%	6/9/2023	3.81%
2/8/2023	3.72%	25/10/2023	3.92%	7/6/2023	3.84%
5/7/2023	3.59%	27/9/2023	3.90%	8/3/2023	3.75%
3/5/2023	3.20%	23/8/2023	3.83%	7/12/2022	2.73%
5/4/2023	3.04%	26/7/2023	3.80%		
1/2/2023	2.47%	28/6/2023	3.65%		
4/1/2023	2.18%	31/5/2023	3.50%		
2/11/2022	1.79%	26/4/2023	3.50%		
		29/3/2023	3.15%		
		22/2/2023	3.07%		
		25/1/2023	2.40%		
		28/12/2022	2.50%		

Source: Ministry of Economy and Finance.

3. See ECB Press Release of the 14th September 2023.

4. See ECB Press Release of the 14th December 2023 and ECB Press Release of the 26th October 2023.

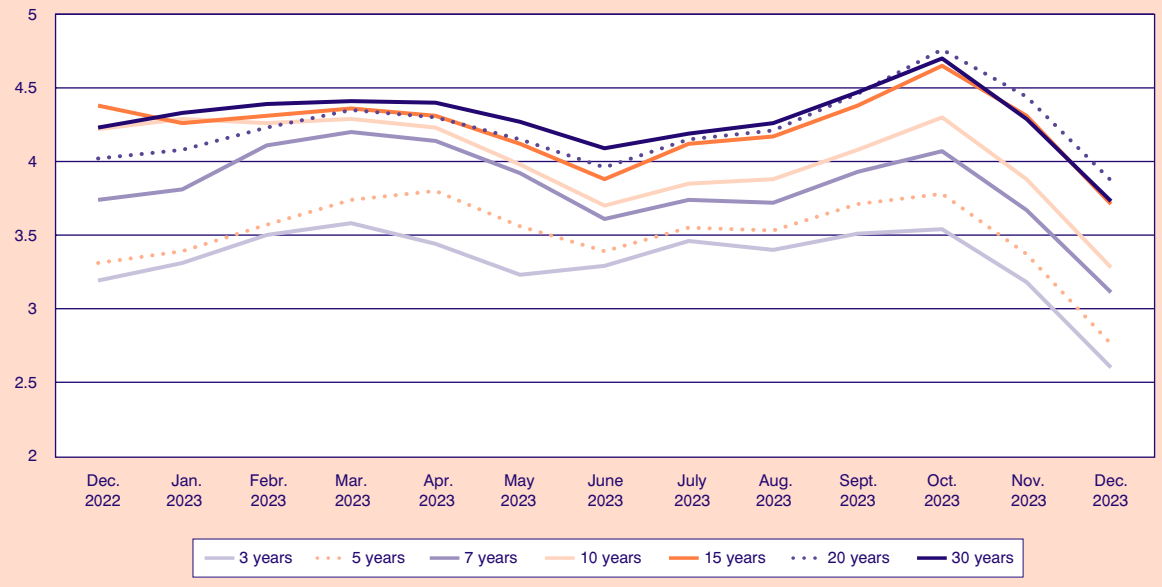
A direct consequence of the increased interest rates during 2023 was the increase in borrowing costs for the Greek Government, as this is also reflected in the yields of the new issues of the Greek Government. More specifically, by examining the issues of Greek Government T-bills in 2023 (Table 1.4.3), it is observed that their yields increased compared to the end of 2022 for all 13-, 26- and 52-week T-bills, with the largest increase recorded for the 13-week T-bills. Furthermore, looking at the interest rates of the Greek Government benchmark bonds, according to Bank of Greece data for 2023 (Figure 1.4.1), we notice that even though the average monthly yield of the Greek government bonds was increased in October 2023 compared to December 2022 for all maturities, during the last months of 2023 a de-escalation of bond yields was observed with the result that the average monthly yield of the Greek government bonds was reduced at the end of the year compared to December 2022 for all maturities. The 10-year bond presented the largest decrease.

Finally, the ATHEX corporate bond indices completed the year 2023 with positive returns. According to ATHEX data, the Hellenic Corporate Bond Price Index[5] recorded a return of 5.09% and the Hellenic Corporate Bond Index[6] a return of 8.90% in 2023.[7] However, the cash value of settled transactions of corporate bonds decreased, reaching €221.11 million from €242.33 million in 2022. Note that, according to ATHEX data for the regulated market[8], €600 million was raised in 2023 through the issuance of two corporate bonds, compared to €430 million in 2022 through three corporate bond issues.

1.4.4. The course of the institutional management sector in 2023

According to the Hellenic Fund and Asset Management Association (HFAMA) data (2024), the year 2023 can be characterized as a year of excellent performance for

FIGURE 1.4.1
Monthly average yield (%) of Greek Government benchmark bonds (Dec. 2022 – Dec. 2023) for maturities of 3, 5, 7, 10, 15, 20 and 30 years



Source: Bank of Greece.

5. Based on the net price of each bond.

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

7. Returns on 27/12/2023 according to the daily official list of trading activity of the ATHEX of 29/12/2023.

8. ATHEX Annual Publications 2023 and 2022, Capital Raised.

the Greek institutional management sector. According to HFAMA (2024) data, the total amount of funds under management amounted to €29.51 billion at the end of 2023, recording a remarkable increase of 29.21% compared to the end of 2022. The composition of these funds on 31/12/2023 concerned 53.5% in Undertakings for Collective Investment in Transferable Securities (UCITS), 30.2% in the Asset Management sector, 15.6% in Real Estate Investment Companies (REICs)[9] and 0.7% in Alternative Investment Funds (AIFs).

Focusing on UCITS, there was a significant increase in the total assets of UCITS managed by Greek Mutual Fund Management Companies by 44% since the beginning of 2023, reaching €15.8 billion on 31/12/2023 (€12.87 billion in UCITS Law 4099/12 and €2.92 billion in EU UCITS). Forty-one percent of these assets are bond funds, 20% balanced, 15% Funds of Funds, 15% equity, 5% money market and 4% specialist. Moreover, there were €3.2 billion in total inflows of funds to UCITS in 2023.

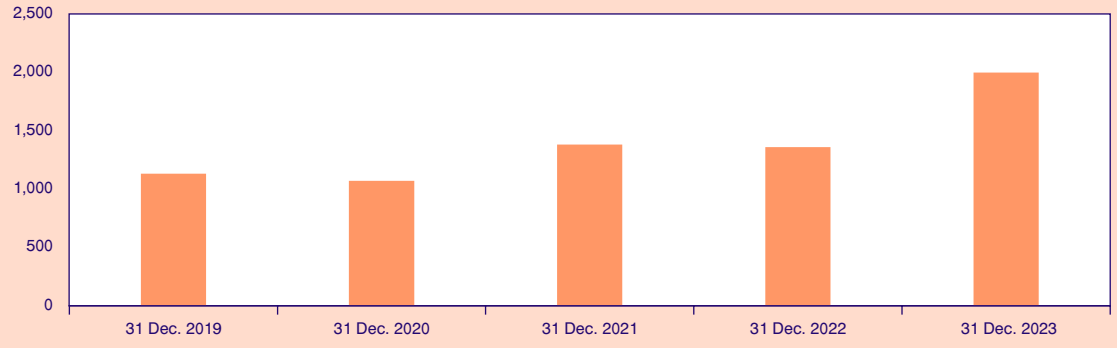
Taking a closer look at the returns of 2023, all UCITs categories recorded positive returns, with equity UCITS standing out. According to HFAMA (2024) data, the highest returns were recorded for the categories of Equity Funds - Greece (40.34%), Index Equity Funds (39.33%), Equity Funds – North America (23.13%), Equity Funds - Global (20.80%) and Balanced Funds (16.58%).[10] Moreover, the Equity Funds - Greece assets, which had the highest return in 2023, increased by 47% compared to the end of the previous year (Figure 1.4.2).

1.4.5. Conclusions

The positive developments in the Greek economy, combined with the recovery of the investment grade, contributed significantly to the impressive positive performance of the Greek stock market for 2023, with the indices of medium and small capitalization as well as the ATHEX sectoral indices of industries, financial services and banks standing out. At the same time, the year 2023 ended with increased capitalization and transactions value compared to the previous year. In the same period, the bond market was affected by successive interest rate hikes by the ECB with borrowing costs increasing for the Greek government. Nevertheless, bond yields ended the year at levels lower than in December 2022, following the observed de-escalation of yields in the last months of 2023, given the pause in continuous rate hikes by the ECB and the recovery of investment grade for Greece. Moreover, the year 2023 ended with an excellent performance by the Greek institutional management sector, recording positive returns, increased assets and capital inflows, with Equity Funds standing out in terms of returns.

The course of the markets in 2023 sets high expectations for 2024. However, challenges remain with regard to geopolitical developments, the de-escalation of interest rates and inflation easing. The recovery of the investment grade was a milestone for the Greek economy and markets in 2023 and is expected to be a catalyst to achieve the goal of the reclassification of the ATHEX as a developed market.

FIGURE 1.4.2
Equity Funds - Greece assets, million € (31/12/2019-31/12/2023)



Source: Hellenic Fund and Asset Management Association.

9. On 30/6/2023 (latest published data), see Hellenic Fund and Asset Management Association (2024).

10. Annual average return of the UCITs category excluding UCITs activated within the year 2023.

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1.5. Recent developments and prospects of the global economic activity: slowdown of global economic growth amid heightened geopolitical uncertainty

Aristotelis Koutroulis

Tight monetary policy, adverse credit conditions, sluggish international trade and low spending on productive investment continue to dampen global economic activity. Amid heightened geopolitical uncertainty, the possibility of a slowdown in global GDP growth for a third consecutive year looms as the most plausible scenario.

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

Compared to 2022, the rate of growth of global GDP decelerated slightly in 2023. However, beating earlier projections, global economic activity remained quite strong amid adverse monetary and financial conditions and elevated geopolitical uncertainty. The resilience of the global economy owns to stronger than expected economic growth in the US, Japan, and several developing countries during the first half of 2023.

The pace of global economic growth is set to remain close to 3% over the forecast horizon. Specifically, after moderating for a third consecutive year, real GDP growth is expected to start accelerating in 2025 (see Table 1.5.1). The growth projections for 2024 reflect the negative effects of contractionary monetary policy, tight financial conditions, sluggish international trade, and the poor performance of private investment.

Risks to the baseline global growth forecasts remain tilted to the downside. Specifically, the set of adverse risks includes: (a) an escalation of the conflict in the Middle East, (b) persistence of core inflation at high levels, (c) higher pressures on money and capital markets due to rising interest rates, (d) slower than expected growth in China, (d) increased fragmentation of global trade, and (e) food commodity price spikes due to extreme weather shocks. On the other hand, the realization of upside risks –a faster pace of disinflation accompanied by lower interest rates, a stronger-than-expected growth in China, normal weather conditions– could lead to higher global output growth than projected in the baseline scenario (IMF, 2024; UN, 2024; World Bank, 2024 and OECD 2023).

1.5.2. Inflation, employment, and investment

After surging for two years, global inflation entered a deceleration phase in 2023. Specifically, global headline inflation fell from the historically high value of 8.7% in 2022 to 6.8% in 2023 (IMF, 2024). Owing to declining energy prices, weakening global demand, and restrictive monetary policy, global inflation is projected to hover at lower levels in 2024, reaching 5.8% (IMF, 2024).

In 2023, headline inflation registered its sharpest decline in advanced economies with annual average inflation falling by three percentage points (see Table 1.5.2). Though core inflation remains high, international organizations' projections suggest that inflation rates in the advanced world will moderate further, by two percentage points in 2024 (IMF, 2024 and UN, 2024).

Inflation prospects for developing countries are less favourable as annual average inflation will fall marginally in 2024. Beyond certain structural problems that interfere with price formation in many regions of the developing world, inflation persistence is related to the depreciation of domestic currencies against the US dollar.

So far, the tight financial conditions and the moderation of economic activity have not adversely affected employment. In most advanced economies, labour markets remain strong, with unemployment rates reaching record low levels (see Table 1.5.3). Nevertheless, there are clear signs that the tight labour market conditions are starting to ease (slowing annual employment growth, fewer job vacancies, increased labour supply, limited nominal wage increases wages and, in some cases, a marginal increase in unemployment) (IMF, 2024 and OECD, 2023).

In the developing world, unemployment is on a downward trend in China, Brazil, and Turkey. However, in most developing economies, unemployment remains high. At the same time, problems such as insecure work, high youth unemployment and gender discrimination in the workplaces remain unresolved. According to United Nations analysts, prospects for labour

TABLE 1.5.1 Real Gross Domestic Product[1,2]

(annual percentage changes)

	2023*					2024**					2025**				
	IMF	EC	OECD	WB	UN	IMF	EC	OECD	WB	UN	IMF	EC	OECD	WB	UN
World economy	3.1	3.1	2.9	2.6	2.7	3.1	2.9	2.7	2.4	2.4	3.2	3.2	3	2.7	2.7
Advanced economies	1.6	1.7	:	1.5	1.6	1.5	1.5	:	1.2	1.3	1.8	1.9	:	1.6	1.6
USA	2.5	2.4	2.4	2.5	2.5	2.1	1.4	1.5	1.6	1.4	1.7	1.8	1.7	1.7	1.7
Euro area	0.5	0.6	0.6	0.4	0.6	0.9	1.2	0.9	0.7	1.1	1.7	1.6	1.5	1.6	1.5
Japan	1.9	1.9	1.7	1.8	1.7	0.9	0.8	1	0.9	1.2	0.8	0.6	1.2	0.8	1.1
United Kingdom	0.5	0.6	0.5	:	0.5	0.6	0.5	0.7	:	0.4	1.6	1.3	1.2	:	1
Developing economies	4.1	4.2	:	4	4.1	4.1	4.1	:	3.9	4	4.2	4.3	:	4	4.2
Brazil	3.1	2.8	3	3.1	3.1	1.7	1.6	1.8	1.5	1.6	1.9	1.8	2	2.2	2.3
Russia	3	2	:	2.6	2.7	2.6	1.6	:	1.3	1.3	1.1	1.6	:	0.9	1.5
India	6.7	6.6	6.3	6.3	6.3	6.5	6.1	6.1	6.4	6.2	6.5	6.5	6.5	6.5	6.6
China	5.2	5.2	5.2	5.2	5.3	4.6	4.6	4.7	4.5	4.7	4.1	4.6	4.2	4.3	4.5

Sources: IMF (2024); European Commission (2023); OECD (2023); United Nations (2024), and World Bank (2024).

* 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 1.5.2 Inflation[1]
(annual percentage changes)

	2023*				2024**				2025**			
	IMF	EC	OECD	UN	IMF	EC	OECD	UN	IMF	EC	OECD	UN
World economy	6.8	:	:	8.1	5.8	:	:	5.7	4.4	:	:	:
Advanced economies	4.6	:	:	4.8	2.6	:	:	2.8	2	:	:	2.2
USA	:	4.2	3.9	4.1	:	3	2.8	2.5	:	2.2	2.2	2.2
Euro area	:	5.6	5.5	5.5	:	3.2	2.9	3	:	2.2	2.3	2.2
Japan	:	3.3	3.2	3.3	:	2.7	2.6	2.7	:	2.2	2	1.8
United Kingdom	:	7.3	7.3	7.4	:	3.6	2.9	3.6	:	2.5	1.9	2.5
Developing economies	8.4	:	:	6.9	8.1	:	:	6.6	6	:	:	4.4
Brazil	:	:	4.6	4.9	:	:	3.2	4.2	:	:	3	3.5
Russia	:	6	:	7.3	:	4.6	:	4.8	:	4	:	4
India	:	:	6.1	5.7	:	:	5.3	4.5	:	:	4.2	4
China	:	:	0.4	0.4	:	:	1	1.6	:	:	1.5	2

Sources: IMF (2024); European Commission (2023); OECD (2023), and United Nations (2024).

* Estimations, ** Projections.

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

TABLE 1.5.3 Annual unemployment rates (advanced economies)

	2023*		2024**		2025**	
	EC	OECD	EC	OECD	EC	OECD
USA	3.7	3.6	4.1	4.1	3.9	4.2
Euro area	6.6	6.5	6.6	6.6	6.4	6.5
Japan	2.5	2.6	2.4	2.5	2.4	2.4
United Kingdom	4.3	4.3	4.7	4.7	4.6	4.9

Sources: European Commission (2023), and OECD (2023).

* Estimations, ** Projections.

markets in developing countries are expected to deteriorate due to tight monetary policy (UN, 2024).

Regarding investment, global fixed capital formation in real terms increased by 1.9% in 2023, i.e., 1.4 percentage points below the 2022 growth rate and 2.1 percentage points below the 2011-2019 period average (UN, 2024). As for the investment activity across productive sectors, available data suggest that the declining rates of investment growth are a major concern for manufacturing. In contrast, investments in the energy sector have gained momentum with 'clean' energy exhibiting the highest growth rates. However, investment projects in renewable energy sources are concentrated in advanced economies. In addition, the scale of these projects so far falls short of what is required to achieve zero emissions targets by 2050 (UN, 2024).

1.5.3. Regional developments

Advanced economies

In 2023, the loss of growth momentum in advanced economies was less pronounced than projected thanks to strong private consumption and favourable labour market conditions. In 2024, the average annual growth rate of GDP is estimated to slow further (see Table 1.5.1) as high interest rates are expected to weigh on consumption and investment (World Bank, 2024).

After a year of good economic performance, growth in the US is set to slow in 2023 as consumption and investment are expected to moderate in response to tighter financial conditions. In contrast, economic activity in the Eurozone is projected to firm up due to declining inflation, rising real wages and high employment rates (ECB, 2023). In Japan, despite loose monetary and fiscal policy, the rate of economic growth in 2024 is estimated to decline by about one percentage point. This deterioration partly reflects the decline in external demand due to the slowdown in the economies of China and the US (UN, 2024). Finally, the economy of the United Kingdom is expected to move slightly above the limits of economic stagnation with the GDP growth rate increasing by approximately 0.2%. Given the restrictive economic policy stance, private consumption and investment will be the major drivers of growth (OECD, 2023).

Emerging and developing economies

On average, the annual rate of economic growth in developing countries is expected to hover close to the levels of the past two years (see Table 1.5.1). Nevertheless, near term projections are diverging. For example, economic performance is set to improve in countries with strong credit ratings. By contrast, low-credit-rating countries with high inflation and high public debt are expected to experience a loss in growth momentum (World Bank, 2024).

In China, GDP growth acceleration in 2023 was supported by low interest rates, increased public spending, and strong private consumption. Growth is forecast to inch down to 4.6% in 2024, reflecting the poor performance of the real estate sector, reduced external demand, and lower rates of expansion of manufacturing production. In India, GDP growth is set to remain strong mainly due to robust domestic demand and high rates of expansion in manufacturing and services. As for Russia, the economy outperformed initial forecasts and returned to positive growth rates

in 2023. However, higher inflation and restrictive economic policy are expected to limit the pace of GDP growth during 2024 (UN, 2024). Finally, the Brazilian economy is expected to experience a loss of growth momentum as export receipts will be negatively affected by the decline in international prices of many basic commodities.

1.5.4. World trade and commodity prices

In 2023, the global trade expansion rate (goods and services) fell to 0.4% from 5.2% in 2022 (see Table 1.5.4). This slowdown is mainly linked to the decline in the international trade of industrial products. By contrast, international trade in services, especially services related to tourism and transport, continued to recover rapidly. In 2024, international trade flows are expected to strengthen, with the rate of expansion increasing by 3 percentage points. This means that the growth rate of international trade will remain below its pre-pandemic trend. In general, factors weighing on the expansion of international trade include: (a) the shift in consumer preferences from trade-intensive products (manufactured goods) to services whose production does not require a large volume of trade, (b) the strengthening of the US dollar, (c) the escalation of geopolitical tensions, (d) adverse credit conditions and the reduction of trade financing, and (e) the reduction of imports and exports on the part of advanced economies (UN, 2024).

TABLE 1.5.4 World trade volume
(annual percentage changes, goods and services)[1]

	2023*	2024**	2025**
World economy	0.4	3.3	3.6
Advanced economies	0.3	2.6	3.2
Developing economies	0.6	4.5	4.4

Source: IMF (2024).

* Estimations, ** Projections.

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

Most commodity prices are on a downward trend mainly due to the weakness of global demand. However, their average annual level over the past year remained 40% higher than that prevailing before the outbreak of the pandemic. Regarding energy products, despite strong fluctuations in international energy prices due to geopolitical tensions, both the average annual price of the main types of crude oil and the corresponding price of natural gas of all types recorded significant decreases. International prices of basic metals also moved to lower levels (by 10%) due to low demand from China, which annually consumes 60% of global production. Finally, the average annual prices of basic food products were 9% lower in 2023 thanks to the high yields of food crops in many geographical areas (World Bank, 2024).

International commodity prices are expected, on average, to continue their downward trend. More specifically, the weakening of global economic activity, combined with the slowdown of the Chinese economy, is expected to drive the annual average price of oil to US $81 per barrel. It is estimated that the price of natural gas will record a similar decrease due to the increase in supply. Base metal prices will also fall due to limited demand from the Chinese manufacturing sector. Finally, regarding food products, their international prices will fluctuate at lower levels from 2023 with the average annual decrease reaching 1% (World Bank, 2024).

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2. Fiscal developments

KEPE, *Greek Economic Outlook,* issue 53, 2024, pp. 33-41

State Budget, public debt and fiscal figures perspectives

Elisavet I. Nitsi

2.1. Execution of the 2023 State Budget

The 2023 State Budget execution, according to the most recent data of the General Accounting Office,[1] on a modified cash basis, shows a deficit of 3,989 million euros or 1.8% of Gross Domestic Product (GPD),[2] against 11,656 million euros or 5.6% of GDP in 2022, while it is much lower compared to the 2024 State Budget estimate of 8,338 million euros or 3.7% of GDP, as well as the 2023 State Budget target of 7,806 million euros or 3.5% of GDP (Table 2.1.1). The primary balance, for the first time since the pandemic, is surplus, as it reached 3,920 million euros or 1.8% of GDP, against a deficit of 6,652 million or 3.2% in 2022 and a target for primary surplus of 2,134 million or 1% of GDP based on the 2023 State Budget. The primary deficit is also slightly higher than the 2023 State Budget estimate, which was foreseen at 851 million euros or 0.4% of GDP (Table 2.1.1). It is obvious that the State Budget execution is clearly improved compared to the 2024 State Budget estimates due to the significant growth of the Greek economy, significantly higher than the Eurozone average, which exceeded the ominous forecasts due to the energy crisis and the inflationary pressures on energy and basic products that created the need to take measures to address them and support citizens, especially the vulnerable.

Both economic recovery and inflation resulted in a significant increase in net revenues of the 2023 State Budget. At the same time, the expenses also increased compared to the corresponding period of the previous year due to the increased needs for relief measures for citizens burdened by the summer fires and the consequent autumn floods, as well as from high prices in goods and services. More specifically, net revenue of the 2023 State Budget, amounting to 67,005 million euros or 30.1% of GDP, increased by 7,382 million euros or 12.4% compared to 2022, as well as the target set by the 2023 State Budget, which projected that revenues were set to reach 63,885 million euros, an increase of 3,120 million euros or 4.9%. This led to an upward revision of the revenue figures to 65,196 million euros in the latest estimate in the 2024 State Budget, with the deviation narrowing to just 1,809 million euros or 2%. This increase came mainly from increased tax revenues, i.e., from 55,127 million euros in 2022, tax collection jumped to 61,627 million euros or 11.6% in 2023, an increase that translates to about a percentage point of GDP. More specifically, the higher increase is from income tax collections of both individuals and companies, as the economy operates in an environment of normality with significant economic growth, higher than the European average, and employment, with the parallel increase of the minimum wage, that led to increased incomes for workers and businesses. More specifically, income taxes increased from 17,012 million euros in 2022 to 23,385 million euros in 2023, i.e., an increase of 3,872 million euros or 22.8%. This increase translates to more than a percentage point of GDP (1.1%). In addition, VAT collections increased from 21,424 million euros in 2022 to 23,385 million euros in 2023, an increase of 1,961 million euros or 9.2%. This increase stemmed from the significant increase in the prices of goods that yielded significantly higher VAT, but also from the significant increase in tourism receipts that were higher than in 2019.

As regards expenditures, these amounted to 70,765 million euros or 31.8% of GDP, showing a reduction of 514 million euros or 0.7% compared to 2022. They also show a larger discrepancy in relation to the expenditures initially predicted by the 2023 State Budget by 1,106 million euros or 1.5%, as during the period of its submission, extraordinary measures had been launched to deal with the major energy crisis and the

1. The State Budget Execution Bulletin, December 2023, Ministry of Finance, January 2024.

2. According to the GDP projections for 2023 from the 2024 State Budget.

TABLE 2.1.1 State Budget 2022, million euros on a modified cash basis

	2022		2023	
	Outcome[1]	Outcome[1]	Budget forecasts 2023[2]	Budget estimates 2024[3]
State Budget				
Net Revenue	**59,623**	**67,005**	**63,885**	**65,196**
Taxes	55,217	61,627	57,421	**61,019**
From which:				
VAT	21,424	23,385	22,198	23,231
Excise taxes	6,984	7,018	7,117	7,038
Property taxes	2,692	2,491	2,380	2,539
Income taxes	17,012	20,884	17,772	20,566
Social contributions	56	58	55	56
Transfers	6,357	7,530	7,953	6,230
Sales of goods and services	883	848	2,418	968
Other current revenue	3,301	3,930	2,124	3,592
Sales of fixed assets	35	25	24	7
Tax refunds	6,153	6,993	6,110	6,677
Expenditure[4]	**71,279**	**70,765**	**71,871**	**73,533**
Compensation of employees	13,640	14,039	13,796	14,150
Social benefits	391	417	397	414
Transfers	35,086	33,399	32,476	33,870
Purchases of goods and services	2,145	2,145	1,541	2,364
Subsidies	400	118	80	180
Interest payments (gross basis)	5,039	7,706	5,851	7,503
Other current expenditure	55	49	81	96
Non allocated expenditure (without PIP and DRF)	0	0	3,156	1,777
Purchase of fixed assets	3,496	1,691	2,531	2,358
PIP[5]				
Revenue	3,581	3,323	4,449	3,763
Expenditures	8,182	9,112	8,300	8,750
Development and Resilience Fund[6]				
Revenue	1,718	3,405	3,436	1,718
Expenditures	2,843	2,089	3,662	2,072

TABLE 2.1.1 (continued)

	2022	2023		
	Outcome[1]	Outcome[1]	Budget forecasts 2023[2]	Budget estimates 2024[3]
State Budget Primary Balance[7]	-6,652	3,920	-2,134	-851
% GDP	-3.2%	1.8%	-1.0%	0.4%
State Budget Balance[7]	-11,656	-3,989	-7,806	-8,338
% GPD	-5.6%	-1.8%	-3.5%	-3.7%
GDP[8]	206,620	222,766	224,134	222,766

Sources: Budget Introductory Report 2023 and 2024, Ministry of Finance.
2023 State Budget Execution, General Accounting Office, Ministry of Finance, January 2024.

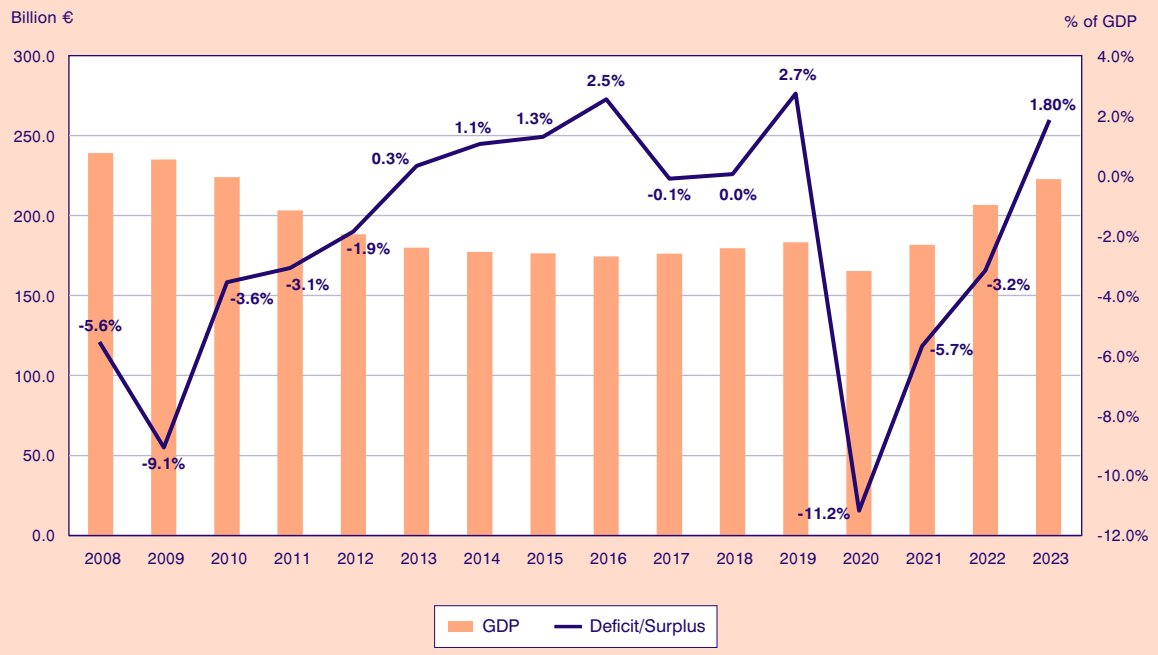
Notes:
1. The data for the revenues and expenditures of the State Budget for the years 2022 and 2023 are temporary and will be finalized with the ratification of the Revenue and Expenditure Report of the State for the fiscal years 2022 and 2023.
2. 2023 Budget forecasts, adjusted to aggregate figures as depicted in the 2023 Budget Introductory Report.
3. 2023 Budget estimates, adjusted to aggregate figures as depicted in the 2024 Budget Introductory Report.
4. Data is presented according to the new economic classification (Presidential Decree 54/2018).
5. Public Investment Programme revenues are included in lines “Transfers” and “Other current revenues”, while expenditures are included in “Non allocated expenditure”.
6. Development and Resilience Fund revenues are included in lines “Transfers”, while expenditures are included in “Non allocated expenditure”.
7. + surplus, - deficit.
8. The GDP estimate for 2023 as reflected in the estimates of the Introductory Report of the 2024 Budget.

consequent global economic crisis, as well as the large price increases of basic products. This expenditure decrease came from transfers (1,687 million euros or 4.8% compared to 2022), a fact that was foreseen in all the relevant targets and estimates, as well as the acquisition of fixed assets and more specifically from the reduced cash payments of the equipment programmes of the Ministry of National Defense (1,841 million euros or 54.1% compared to 2022). However, there is a decrease in expenditures compared to the 2024 State Budget estimate, in which they were estimated to reach 73,533 million euros or 33% of GDP. This reduction (1.2% of GDP) is mainly due to non-allocated expenditures which were ultimately not needed, as part of the General Government bodies needs were served using their own resources, without the need for an additional state grant.

The Public Investment Programme (PIP) shows a decrease in revenues, as they amount to 3,323 million euros or 1.5% of GDP, decreased by 258 million euros or 7.2% compared to the 2022 outcome, and 1.126 million euros or 25.3% against the target set in the 2023 State Budget. The deviation is smaller than the 2024 State Budget estimate and reaches 440 million euros or 11.4%. On the contrary, expenditures, amounting to 9.112 million euros or 4.1% of GDP, show an increase by 930 million euros or 11.4% compared to 2022, 812 million euros or 9.8% compared to the 2023 State Budget target, and 362 million euros or 4.1% compared to the 2024 State Budget estimate. In addition, 2,089 million euros or 0.9% of GDP was spent from the Recovery and Resilience Fund for 2023, while revenues amounted to 3,405 million euros or 1.5% of GDP. TAA’s revenues are very close to the 2023 State Budget forecast (3,436 million euros) but far from that of the 2024 State Budget estimate, which was 1,718 million euros.

Overall, the improved course of revenues as well as the reduction in expenditure significantly improved the fiscal outcome and the State Budget balance. Figure 2.1.1 shows the evolution of the primary deficit/surplus in the period 2008-2023 together with the evolution

FIGURE 2.1.1
Gross Domestic Product (GDP) and State Budget Primary Deficit/Surplus 2008-2023 (in % of GDP and billion €)



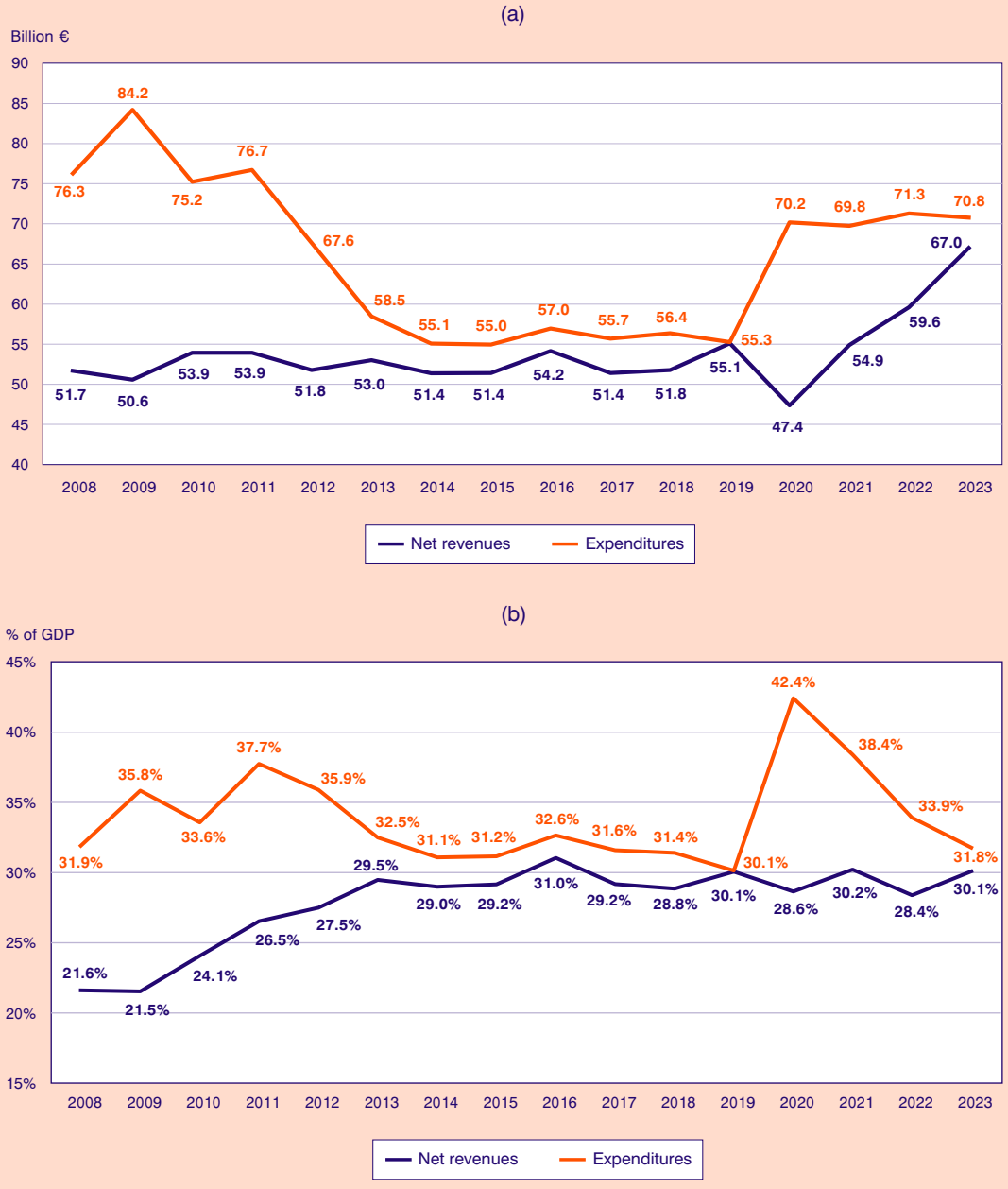
Source: Budget Introductory Report, several issues.
2023 State Budget Execution, General Accounting Office, Ministry of Finance, January 2024.

Note: 2023 is an estimation from the State Budget of 2024.

of the GDP. The period spans from 2008, before the debt crisis of the Greek economy, until the most recent data. From the figure it becomes clear that, in 2023, the estimate for the GDP shows significant growth and thus, with its continuous rise since 2018, a significant part of the losses both from the pandemic and from the economic crisis has been recovered, since it approaches the country's GDP in 2010, the year Greece joined the support mechanism. In addition, 2023 is the first year since 2016 that the primary balance shows a surplus of 1.8% of GDP.

It is interesting to see the course of the State Budget revenues and expenditures in the same period (Figure 2.1.2). Until 2019, a year when revenues and expenditures are almost balanced (Figure 2.1.2a), revenues remained at the same level, with small fluctuations per year around 50-55 billion euros, while expenditures showed a significant decrease until 2014, with a particular drop in the years when the consolidation programme contained cost reduction measures and relative stabilization until 2019, around 55 billion euros. In 2020, due to the Covid-19 pandemic and the consequent significant recession, as well as the measures taken to cover the needs arising from it, revenues fell well below 50 billion euros, while expenditures jumped to 70 billion euros. In 2021, revenues returned to 55 billion euros, and for the first time in 2022, they exceeded the threshold of 55 billion euros, reaching 60 billion euros, while in 2023 they reached the level of 67 billion euros, due to high income and VAT tax collections. On the other hand, spending stabilized in the three-year period 2021-23 at the high levels of 70 billion euros, due to the pandemic (in 2021), the energy crisis and inflationary pressures that required the financial support of vulnerable households, but also as a result of the climate crisis in the country–fires and floods (2022-2023). It should be noted that more important than the absolute size of revenues and expenses are their prices as a percentage of GDP, in order to have a measure of comparison. Thus, although the decrease in spending as a percentage of GDP in the period up to 2019 is very small, the increase in 2020 is particularly significant, as GDP reached its lowest level in the period under review. Conversely, revenues as a percentage of GDP increased from 21.6% of GDP in 2008 to 29.5% of GDP in 2013 and stabilized around 30% of GDP in the rest of the period (Figure 2.1.2b).

FIGURE 2.1.2
State Budget's net revenues and expenditures 2008-2023 (in billion € and % of GDP)



Source: Budget Introductory Report, several issues.
2023 State Budget Execution, General Accounting Office, Ministry of Finance, January 2024.

Note: 2023 is an estimation from the State Budget of 2024.

2.2. The evolution of Greek public debt, third quarter 2023

According to the latest data available from the General Accounting Office,[3] for the third quarter of 2023, the Central Government's debt amounted to 402,877.43 million euros, showing a reduction of approximately 1.8 billion euros (0.5%) compared to the previous quarter, while it is increased by 2.6 billion euros (0.6%) in relation to end of the year 2022 and 9.4 billion euros (2.4%) compared to the corresponding quarter of 2022. In addition, cash deposits showed an increase of 447.5 million euros (0.1%) compared to the previous quarter, 1.3 billion euros (0.3%) compared to the end of 2022, and 2 billion euros (0.5%) in relation to the corresponding quarter in 2022.

The composition of Central Government debt in the third quarter of 2023 is presented in Table 2.2.1. The Central Government debt was converted in its entirety into a fixed interest rate and into euros. Regarding the way of trading, the change in the composition of debt in favor of non-tradable debt, compared to tradable, was 25.2% and 74.8%, respectively, during the period under review. In addition, as regards the guarantees granted by the Greek State, they stabilized in the last quarter under 30 billion euros.

The distribution of debt, based on the residual maturity in the third quarter of 2023, is reflected in Table 2.2.2. Short-term Greek Government securities (with maturity of less than one year) represent 16.8% of the total, compared to 11.8% from the medium-term notes (with maturities of one to five years), and 71.4% from

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

Period	2022 (C΄ quar.)	2022 (D΄ quar.)	2023 (B΄ quar.)	2023 (C΄ quar.)
Outstanding Central Government debt	**393,489.34**	**400,275.64**	**404,685.60**	**402,877.43**
Debt by type of interest rate				
Fixed rate[2]	393,489.34	400,275.64	404,685.60	402,877.43
Floating rate[2,3]	0.00	0.00	0.00	0.00
Debt by way of trading				
Tradable	96,404.89	96,866.70	99,147.97	101,525.11
Non-tradable	297,084.45	303,408.94	305,537.63	301,352.32
Debt by currency				
Eurozone	393,489.34	400,275.64	404,685.60	402,877.43
Non-Eurozone currencies	0.00	0.00	0.00	0.00
Cash deposits of the H.R.[4]	**18,133.5**	**18,796.70**	**19,655.20**	**20,102.7**
Debt guaranteed by the Central Government	**29,960.98**	**29,631.20**	**29,432.30**	**29,384.90**

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 30/6/2023 and 30/9/2023.
* Estimates.

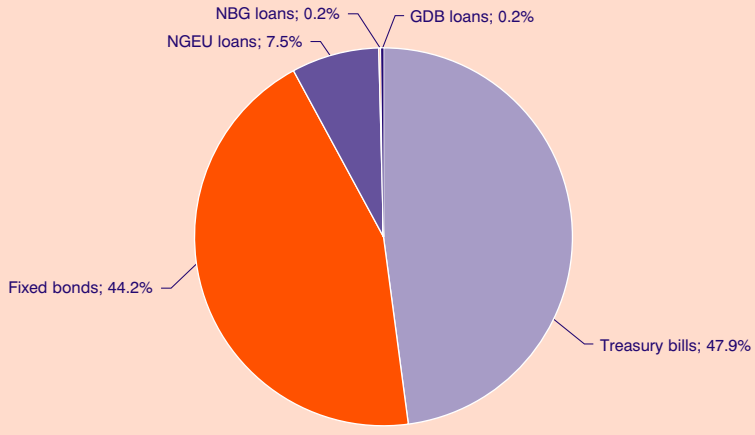
3. *Public Debt Bulletin,* September 2023, General Accounting Office, Ministry of Finance.

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

Period	2022 (C΄ quar.)	2022 (D΄ quar.)	2023 (B΄ quar.)	2023 (C΄ quar.)
Total volume	**393,489.34**	**400,275.64**	**404,685.60**	**402,877.43**
Short-term (up to 1 year)	63,665.41	68,876.94	71,385.66	67,518.65
Medium-term (1 to 5 years)	40,485.46	42,656.63	48,205.73	47,523.54
Long-term (more than 5 years)	289,338.47	288,742.07	285,094.21	287,835.24

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

FIGURE 2.2.1
Composition of borrowing for the third quarter of 2023



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

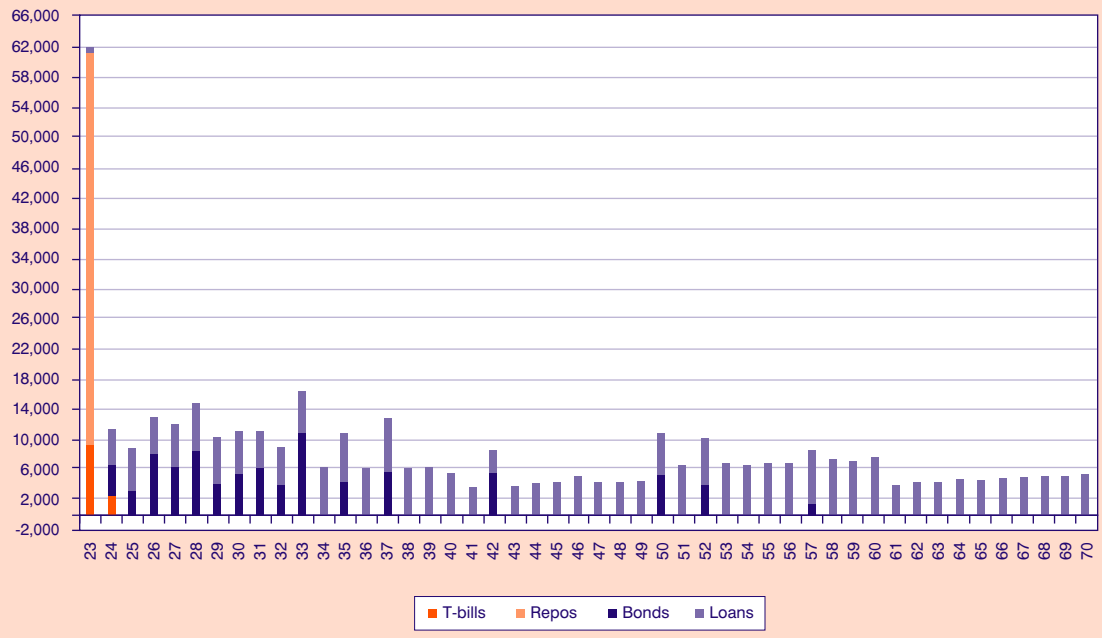
long-term issues (maturity after five years) from 17.6%, 11.9% and 70.4%, respectively, in the previous quarter of 2023. Compared to the same quarter of 2022, an increase in the share of short-term and medium-term securities is observed with a corresponding decrease in the long-term securities.

The average residual maturity of the total Central Government debt stood at 7.18 years, slightly reduced from that of 18.01 years in the corresponding quarter of 2022. Moreover, the average residual maturity of the total Central Government debt amounted to 5.03 years, almost half of the 9.80 years in 2021. The new borrowing for the third quarter of 2023 decomposes to 47.9% in Treasury bills, 44.2% in fixed bonds, 7.5% in NGEU loans and 0.2% in bonds coming from the National Bank of Greece (NBG) and the Greek Development Bank (GDB) (Figure 2.2.1).

Figure 2.2.2 shows the redemption schedule of the Central Government debt based on the latest published data. From the display of newer data, it seems that apart from the rest of the year (2023), the dispersion of the burden of redemption of public debt has now leveled, with few exceptions, at less than 14 billion euros per year until 2070.

In conclusion, the debt decreased compared to the second quarter of 2023, which demonstrates that the financing needs of the Greek economy in this period, although increased due to the financing needs of measures to deal with disasters from the climate crisis

FIGURE 2.2.2
Redemption schedule of Budgetary Central Government debt on 30/9/2023 (amounts in million euro)



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

Notes: Securities' maturities are smoothed with debt repurchases and management operations. Including extension of EFSF loans agreed at the Eurogroup of 22-6-2018.

and the price increases in basic goods, were covered in a fiscally neutral way.

2.3. Fiscal figures perspectives

In an international environment of increased economic uncertainty, stemming both from increased geopolitical tensions in various regions of the world and monetary tightening policies followed by Central Banks, expectations for the Greek economy in 2024 remain optimistic. The country's growth rate is expected to reach 2.9% from the 2.4% estimated to close in 2023, which, in nominal terms, will exceed for the first time the country's GDP in 2010, the year Greece entered the first economic adjustment programme. Nevertheless, it will still be higher than the Eurozone average, which is expected to be 1.2%.

The Greek economy still has a positive outlook mainly due to the fiscal policy measures implemented at the end of 2023 and from the beginning of 2024, the damage restoration from recent disasters, as well as the expected positive effect of the implementation of the "Greece 2.0" plan, which, together with the investment grade, will lead to an increase in investments. In addition, limiting the reduction in private consumption, despite the significant inflationary pressures, through civil servants' salary increases, minimum wage and employment, and the re-introduction of the maturity allowance (the so-called three-years allowance) in the private sector will increase this optimism. Finally, the further reduction of the debt-to-GDP ratio, mainly due to economic growth, gives the Greek economy a new dynamic in the international financial markets.

However, in addition to the unfavorable international environment, the Greek economy is also burdened by the European Central Bank's (ECB) high interest rates, which increase the cost of borrowing, as well as the effect of the geopolitical crises in Ukraine and Gaza on the prices of both energy and imports (products and inputs). Continued inflation, mainly in basic goods and energy, may undermine confidence in the Greek economy. However, the foreign trade balance remains the main issue of the Greek economy, which increases with increased incomes, as imports of consumer goods and inputs increase, without a corresponding increase in exports, indicating the problematic production model of the country.

Regarding the 2024 State Budget execution, it is estimated that the country, even though the escape clause of the Stability and Development Pact was

abolished, will exceed the 2% of GDP limit for primary surpluses. In addition, the exclusion of defense spending from the deficit, if these limits are exceeded, is a safety net for meeting the Pact's goals. The significant increase in tax revenues, both from income tax and VAT, is expected to continue in 2024, given the growth rates, salary increases and product prices, giving the necessary fiscal space for fiscal interventions where deemed necessary, without burdening the budget. Expected tourism receipts that look set to be even higher from 2023 are another reason for optimism about fiscal stability. Finally, interventions aimed at combating tax evasion will increase tax revenues even more but will also contribute to the fair distribution of tax burdens and the strengthening of social policy.

On the contrary, risk factors can be considered among others: (a) the increased costs due to the natural disasters experienced by the country in 2023, as well as new ones given the climate crisis, as compensations must be given to those affected, (b) the significant restriction of consumption due to inflation that will have an impact on VAT collections, (c) the higher cost of servicing the debt, since, despite the upgrade to investment grade, the debt is refinanced at a higher interest rate than the average interest rate of the existing debt (around 2%), due to the increase in ECB interest rates and (d) the untimely absorption of European funds, and especially those of the Recovery and Resilience Fund, which have a pressing time horizon.

Based on the above, the possibility of interventions and state support for households and businesses should be targeted and temporary in nature and financed from the available fiscal space, maintaining a "restrictive" fiscal policy, so as to create the necessary primary surpluses and not to fuel inflationary pressures and contain the increase in borrowing costs.

3. Human resources and social policies

KEPE, *Greek Economic Outlook,* issue 53, 2024, pp. 42-46

3.1. Recent developments in key labour market variables

Ioannis Cholezas

3.1.1. Introduction

Key labour market variables improved in the third quarter of 2023, and the subsequent two months seem to extend those improvements. The number of the employed went up while the unemployment rate dropped on a year-on-year basis. Moreover, the labour force participation rate remained practically constant. The number of the employed is still below the pre-crisis level, but the employment rate for the 15-64 age group has reached a maximum. This is partly due to the reduction of the population, which should cause concern, mostly because an increase in the participation rate, which could compensate for the declining population, has not been accomplished; hence, the labour force is shrinking. This is a real problem given personnel shortages that seem to dominate the public discourse lately. On the other hand, the number of paid employees increased in 2023 by 116 thousand, and most of the hires involved full-time job contracts. Lastly, despite the reduction in the number of the unemployed over the past year, the number is still way above the minimum recorded in the 2000s. Moreover, despite the reduction of the unemployment rate for the general population, it is still the second highest in the European Union (EU27). Henceforth, there is no room for complacency.

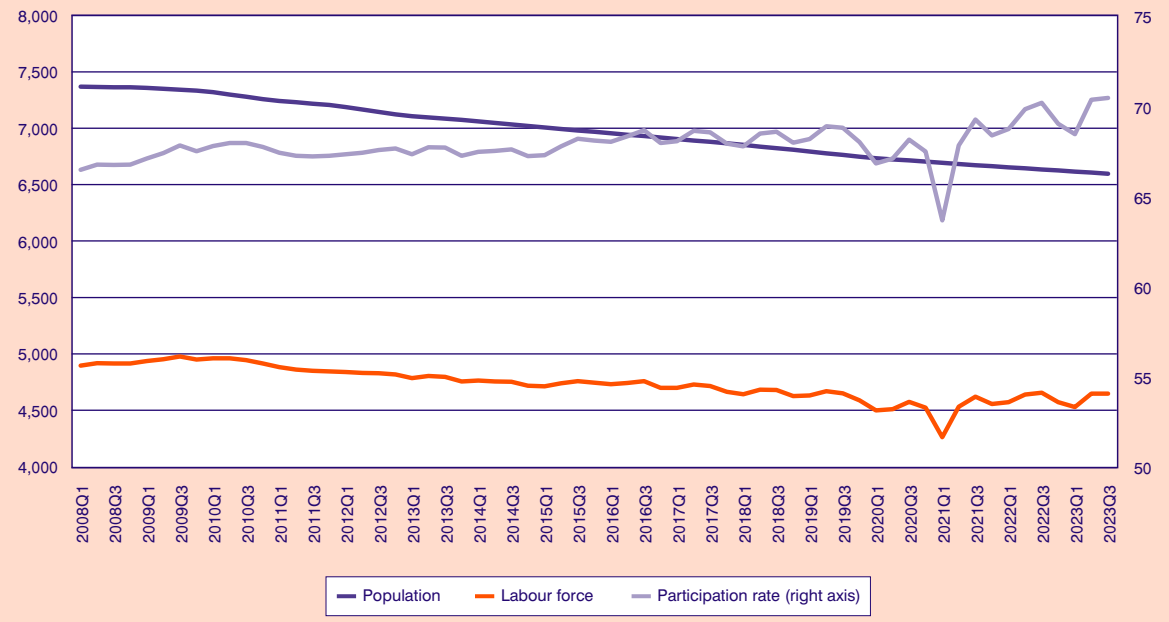
3.1.2. Population and labour force participation

The population in Greece has been declining over the past years (see Graph 3.1.1), according to the Labour Force Survey (LFS). Focusing on annual changes due to seasonality, thus comparing the 15-64 population in a specific quarter with that of the respective quarter a year before, it is evident that the decline started in the first quarter of 2009 and has continued since. The average annual rate of decline in period 2009-2023 was 0.7%, while the overall reduction of the population has reached 768.4 thousand people. The question is, why should we care about the population when discussing the labour market? To answer that, one must consider the role of people as a factor of production, i.e., labour. The number of people willing and able to work across age brackets, i.e., the labour force, is directly related to the population and constitutes an input in the production function. Recently, personnel shortages in various industries, like tourism and ICT, have become a hot topic in public discourse. These shortages may have an adverse impact on firms and the economy, since without the necessary (and suitable) personnel, the ability to provide enough goods and services is compromised. Hence, in a growing economy, i.e., one that increases its output in terms of goods and services, the labour force must also expand.[1] The expansion can come from two sources: an increasing population and an increasing share of people willing and able to work, which is known as participation or activity rate. When the population is decreasing, to keep the labour force constant, the participation rate must increase. In other words, more and more people must be willing to join the labour force and ultimately get a job.

One look at the LFS data reveals that this is not happening, at least to the necessary extent. Instead, the participation rate over the past year has remained almost stable (it increased by 0.3%) at 70.4% for the entire population (see Graph 3.1.1), 78.3% for men and 62.6% for women. Therefore, given that the population has been shrinking, unsurprisingly, the size of the labour force aged 15-64 has also decreased by 8.7 thousand over the past year. This decrease came mainly from men, whose number dropped by 17 thousand, while participating females increased by 8.4 thousand, counterbalancing the losses to some extent. Moreo-

1. In practice this is not accurate. Increasing production, given that the stock of other factors of production is held constant, could come from either increasing the labour force or from increasing the labour productivity. In the latter, technological advancements play a crucial role. For the sake of the argument though, that is ignored.

GRAPH 3.1.1
Population, labour force and participation rate, 15-64 y.o. (in thousand)



Source: Labour Force Survey, ELSTAT, KEPE processing.

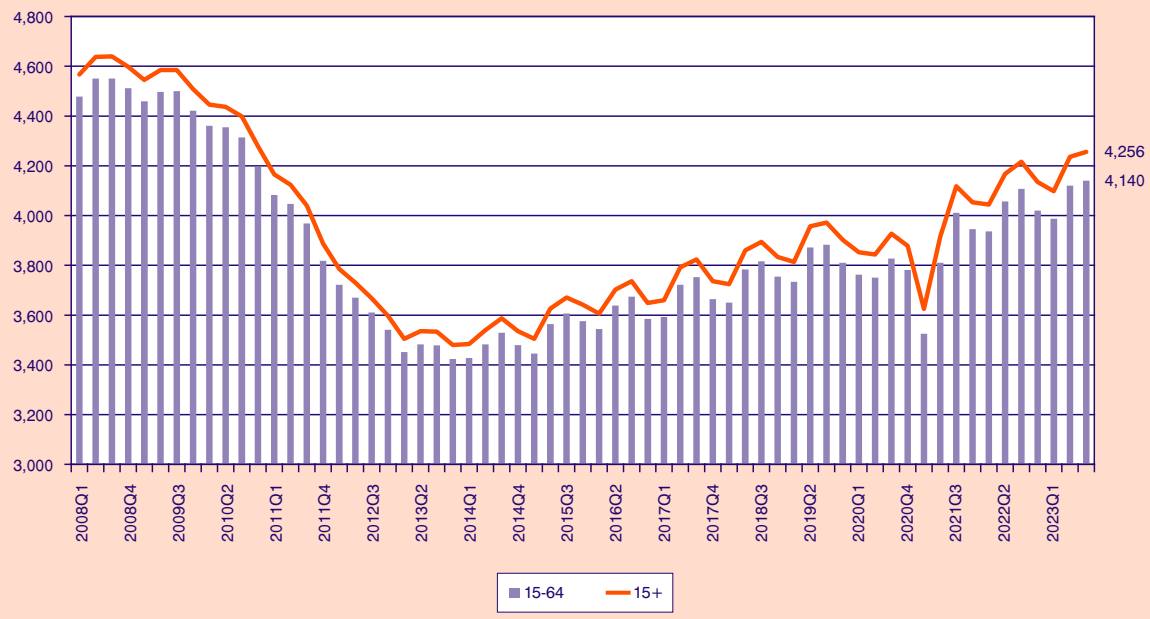
ver, looking into the native-foreign composition of the labour force reveals that the decrease comes from native men. More detailed analysis by age and gender also shows that men aged 25-29 and women aged 20-24 and 30-34 are the groups that exhibited the biggest decreases–a problem that must be addressed. An in-depth analysis of the data could shed light on the reasons that led to these specific decreases and, consequently, reveal whether they are temporary and whether there are ways they can be reversed. A simple comparison with other member countries of the European Union (EU27) shows that there is room for higher participation rates, especially amongst women, since in 2023Q3 their participation rate was 7.8 percentage points lower than the European average.

3.1.3. Employment

Even though the labour force shrank, the number of employed over the age of 15 increased by 40.2 thousand over the past year, i.e., between 2022Q3 and 2023Q3, and by 19.7 thousand over the past quarter, i.e., since 2023Q2. Most of that increase involved employed women, with an increase of 39 thousand, representing 97% of the total increase. Unsurprisingly, the employment rate also increased. On a year-on-year basis, that increase reached 0.5 percentage points for individuals 15+ and 0.9 percentage points for individuals 15-64. Clearly, even though the number of the employed has been increasing since 2014, it is still below the pre-crisis level (see Graph 3.1.2). On the contrary, the employment rate for the age group 15-64 surpassed the one in 2008Q3, reaching 62.8%. However, it is still below the pre-crisis level by 2.1 percentage points for the group 15+. This is the result of decreasing population.[2] It is interesting that this increase is driven by women, since the employment rate for men is below the 2008Q3 level. Moreover, there is a sharp increase in the employment rate of women aged 15-64 compared to 2008Q3 (4.5%). On the other hand, the employment rate for women continues to be much lower compared to men (53.5% vs. 72.1% in group 15-64), while the gender differential has been stable at around 18.5 percentage points since the beginning of the upward movement of employment back

2. When calculating the employment rate, the population is the denominator. Therefore, a decrease in the population increases the employment rate even if the number of the employed has not changed.

GRAPH 3.1.2
Number of employed individuals aged 15+ and 15-64 (in thousand)



Source: Labour Force Survey, ELSTAT, KEPE processing.

in 2014. Compared to the EU27, the employment rate in Greece is low (62.8% compared to 70.7%), especially for women (53.5% vs. 65.9%). Therefore, with the right policies, it could be increased.

The number of employed youth, i.e., aged 15-29, increased faster than the number of the employed aged 30-64. Over the past year, the number of the former increased by 18.2 thousand and the number of the latter went up by 14.1 thousand. Those numbers correspond to an increase of 3.4% in the first case and 0.4% in the second case, showing how dynamics differ between these age groups. Between the second and the third quarter of 2023, increases reached 1.8% and 0.3%, respectively. However, the employment rate for youth stood at 35.9% in 2023Q3 when the respective rate for individuals 30-64 was 71.7%. There is an obvious difference between age groups evidently because many youths are still in education, and they often prolong their studies beyond the statutory duration.

The number of employed foreigners over the age of 15 increased faster over the past year than the number of employed natives. Even though the latter increased by 25.3 thousand and the number of employed foreigners increased by 14.8 thousand, in terms of percentage change, the number of employed natives increased by 0.6%, while the number of employed foreigners increased by 9.1%. Moreover, employed native men are the only group that exhibited a decrease on a year-on-year basis, while employed foreign women exhibited the biggest percentage increase (15.5%). However, in absolute terms, employed native women increased by 28.6 thousand and constituted the main driver of increasing employment over the past year, followed by employed foreign men.

At the time of writing this piece, the LFS data for the last quarter of the year had not yet been published. However, one can get a good idea of what is coming based on the monthly data for October and November. Relying on those data and comparing the figures to those in the respective months of 2022, it turns out that the number of the employed went up by 139.1 thousand in October and 12 thousand in November. On a monthly basis, the number of employed individuals increased in October (compared to September) by 52.3 thousand but decreased in November (compared to October) by 87.8 thousand. There were similar movements in previous years, so there is nothing extraordinary there.

3.1.4. Paid employment

The LFS data shows that the share of paid employees in 2023Q3 reached 69.1% of total employment, slightly smaller than the share in the second quarter of the

year (69.7%), since the number of employees dropped by 8.8 thousand on a quarterly basis and by 22.3 thousand on an annual basis. These figures do not match those of the ERGANI information system, which point to an increase in the number of employees in 2023Q3 by 7.2 thousand. However, what is important here is that about two-thirds of the employed in Greece are employees, a share which is lower than the European average but has been increasing over the years, especially since the crisis.

ERGANI has published data on paid employees until the end of the year. Therefore, we can get a solid view of how paid employment evolved throughout 2023. Over the year, net new paid employment jobs, i.e., hires minus layoffs and quits, exceeded 116 thousand. This number is better than the respective one in 2022, but it falls short when compared to previous years in period 2013-2022. The balance was negative (more jobs lost) in January, July, August, October, and November, while all the other months had a positive balance (more hires than layoffs and quits). There were significantly more losses in October and November compared to 2022, but without setting any records. For example, the balance was negative in July in the years 2015, 2018 and 2019. Similarly, the negative balance in October was not significantly wider than October 2019 (131.5 thousand vs. 125.7 thousand). The same goes for the months with a positive balance. Therefore, the overall result is not driven by any specific month. There were more quits and layoffs in 2023 compared to previous years, especially layoffs. However, the wide positive balance in December, the second widest since 2013, could signal favourable developments in 2024. Having said that, we should not jump to conclusions, since there is typically a negative balance in January.

Throughout the year, most hires involved full-time job contracts. Overall, 3.2 million hires took place, of which 1.6 million, i.e., 51.4%, involved full-time job contracts. The second most common type of job contract involved part-time: 1.3 million hires or 39.2% of total. The number of work-in-shifts new job contracts marginally exceeded 303 thousand, representing 9.4% of the total. The composition of hires does not exhibit considerable deviations from past years. There are some differences, though, compared to 2019 and earlier. Back then, hires that involved full-time job contracts were fewer than half of the total, while hires that involved work-in-shifts represented more than 12% of total, signalling instability in the labour market and a "wait and see" attitude on the side of firms who did not want to commit to full-time job contracts. Hence, hires seem to have become more stable over the past years, favouring full-time job contracts. The fact that almost 40% of hires in 2023 involved part-time employment could reflect the consolidation of flexible forms of employment in the Greek labour market.

The number of full-time job contracts converted to job contracts that involve flexible forms of employment was smaller in 2023 (46.9 thousand) compared to past years, except for 2021 (38.5 thousand) and 2014 (45.8 thousand). Most of those involved conversions to part-time job contracts, also in 2023 (73.5% of total), while conversions to work-in-shifts contracts without the consent of the employee, the most harmful for the employee's welfare, decreased to 4.4% from 6.5% in 2022. This figure is low compared to past years. It exceeds only the respective figure in 2021 (3.3%), which is not representative of the market due to the measures taken to support employment and entrepreneurship against the pandemic. Hence, there seems to be no change regarding conversions in 2023.

3.1.5. Unemployment

The number of unemployed individuals aged 15-64 reached 506.3 thousand in 2023Q3, while that number increases to 514.6 thousand if the unemployed over 65 are added. The decrease over the past year reached 41 thousand people, and it was equally distributed between men (20.9 thousand fewer) and women (20 thousand fewer unemployed). There were 28.9 thousand fewer unemployed in the age group 30-44 over the past year, most of whom were women (26.1 thousand). Consequently, the unemployment rate decreased to 10.9% for people aged 15-64, which was 0.4 percentage points lower than the second quarter of the year and 0.9 percentage points lower than 2022Q3. Monthly LFS data show a further de-escalation of the unemployment rate in the first two months of the last quarter to 9.4%. This means that, with each passing month, the unemployment rate gets closer to the pre-crisis level. For instance, the unemployment rate in 2008Q3 stood at 7.4%, i.e., 3.5 percentage points lower than the unemployment rate in 2023Q3. Alternatively, there were 143.4 thousand more unemployed people in 2023Q3 compared to 2008Q3. The gradual de-escalation of the unemployment rate should not lead to complacency, since it is still the second biggest in the EU27, surpassed only by Spain (11.9%), and almost 5 percentage points above the European average.

Typically, different population groups face different employment prospects, hence different unemployment rates (Table 3.1.1). The unemployment rate for women, for example, was 14.5% compared to 8%

for men. Similarly, the youth unemployment rate in 2023Q3 stood at 21.5%, which means that one out of five people aged 15-29 could not get a job, while the respective unemployment rate for people aged 30-64 stood at 8.9%. More years of education are associated with better employment prospects. For example, people with a PhD or master's degree faced an unemployment rate of 5.9% in 2023Q3, when primary education (at most) graduates faced double that rate. Moreover, foreigners are less likely to find a job compared to natives, since their unemployment rate stood 3.5 percentage points higher than the natives. This difference is smaller amongst men of different ethnic backgrounds (1.3 percentage points) than women (5.6 percentage points).

Over the past year (2022Q3-2023Q3), the unemployment rate went up only for graduates of primary education (at most). The size of the decrease varies across groups of graduates, and it ranges from 0.2 percentage points for Higher Education Institutions (HEI) graduates to 3.8 percentage points for foreign women. The slow pace at which the unemployment rate for HEI graduates has been de-escalating should probably be addressed, even though the fact that it is already low compared to other education groups could be some explanation. On the other hand, due to seasonally volatile economic activities, the unemployment rate dropped compared to 2023Q2, except for people with a PhD and/or master's degree, HEI graduates and foreign men.

TABLE 3.1.1 Unemployment rate by population group

	2022Q3 (%)	2023Q2 (%)	2023Q3 (%)	2022Q3-2023Q3 (percentage points)	2023Q2-2023Q3 (percentage points)
Total	11.8	11.3	10.9	-0.9	-0.4
Men	8.7	8.5	8.0	-0.8	-0.5
Women	15.6	14.8	14.5	-1.0	-0.3
15-29	22.2	21.7	21.5	-0.7	-0.2
30-64	9.8	9.3	8.9	-0.9	-0.5
PhD and master's degree	7.2	4.1	5.9	-1.3	1.8
HEI	9.7	8.5	9.5	-0.2	1.0
Upper Technical Vocational	11.6	11.9	10.6	-1.0	-1.3
Upper Secondary	13.2	12.4	12.3	-0.9	-0.1
Lower Secondary	13.1	12.2	11.1	-2.1	-1.1
Primary or less	11.3	14.7	11.8	0.5	-2.9
Natives	11.4	10.9	10.6	-0.8	-0.3
Men	8.6	8.4	7.9	-0.7	-0.5
Women	15.0	14.1	14.1	-0.9	0.0
Foreigners	16.5	16.9	14.1	-2.5	-2.8
Men	10.8	9.1	9.2	-1.6	0.2
Women	23.6	25.6	19.8	-3.8	-5.8

Source: Labour Force Survey, ELSTAT, KEPE processing.

KEPE, *Greek Economic Outlook,* issue 53, 2024, pp. 47-49

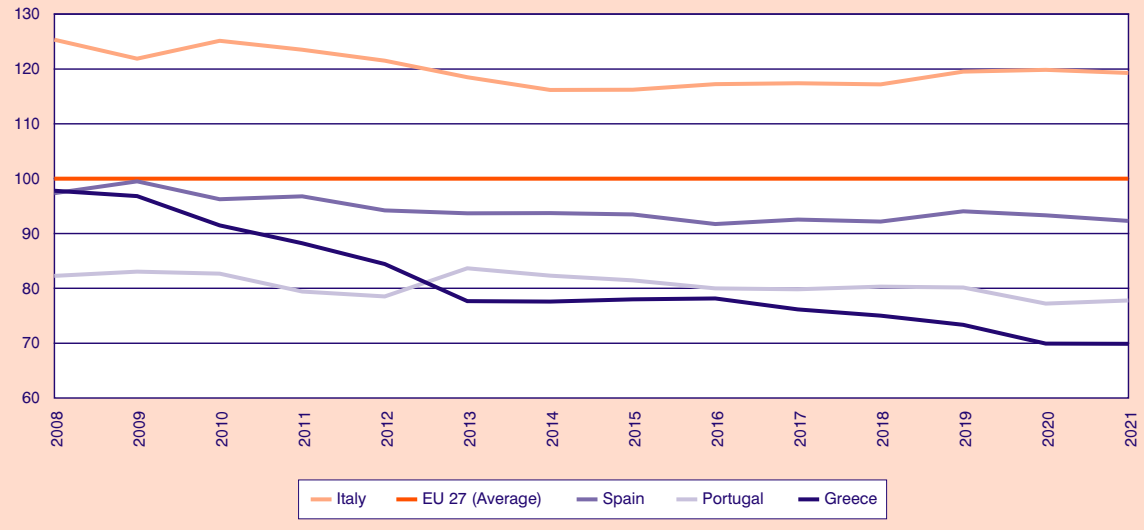
3.2. Social protection expenditure in 2008 and 2021

Vlassis Missos

The period from 2008 to 2021 is characterized by a prolonged and multifaceted crisis, marked by economic downturns, financial instability, and lockdowns. These sequential crises have had both direct and indirect impacts on the living conditions of the population across Europe. In response to these challenges, the European Union (EU) implemented a series of fiscal austerity measures aimed at addressing the high levels of public debt and restoring economic stability. However, these measures often led to significant reductions in *social protection expenditure*, particularly in the EU-deficit-countries, where governments faced immense pressures to cut spending. As a result, many households experienced a decline in their disposable income, exacerbating economic hardship and inequality. Southern European countries, in particular, bore the brunt of these austerity measures, facing stringent fiscal discipline rules imposed by international financial institutions and the EU institutions. More than a decade later, the long-term effects of these policies are evident, as living conditions have become markedly different, with persistent challenges such as high unemployment and poverty continuing to affect communities across the region.[1]

Figure 3.2.1 provides a comprehensive overview of the evolution of social protection expenditure per capita over the period from 2008 to 2021, illustrating deviations from the EU27 average. The index is denominated in Purchasing Power Standards (PPS), offering a standardized metric that facilitates comparisons both across countries and over time. Notably, Italy's total social expenditure stands out, consistently surpassing the EU27 average by a substantial margin of twenty percentage points throughout the period under consideration. Despite experiencing a slight downturn between 2010 and 2015, Italy's expenditure trajectory swiftly rebounded in subsequent years, reflecting a

FIGURE 3.2.1
Social protection expenditure per capita in PPS, as a deviation from the EU27 average (100)



Source: Eurostat.

1. See, Missos V., Domenikos C. and Pontis N. (2024), Hardening the EU core-periphery lines 2009-2019: Dependency, neoliberalism, welfare reformation and poverty in Greece, *Structural Change and Economic Dynamics,* 69, 171-182, <https://doi.org/10.1016/j.strueco.2023.06.005>.

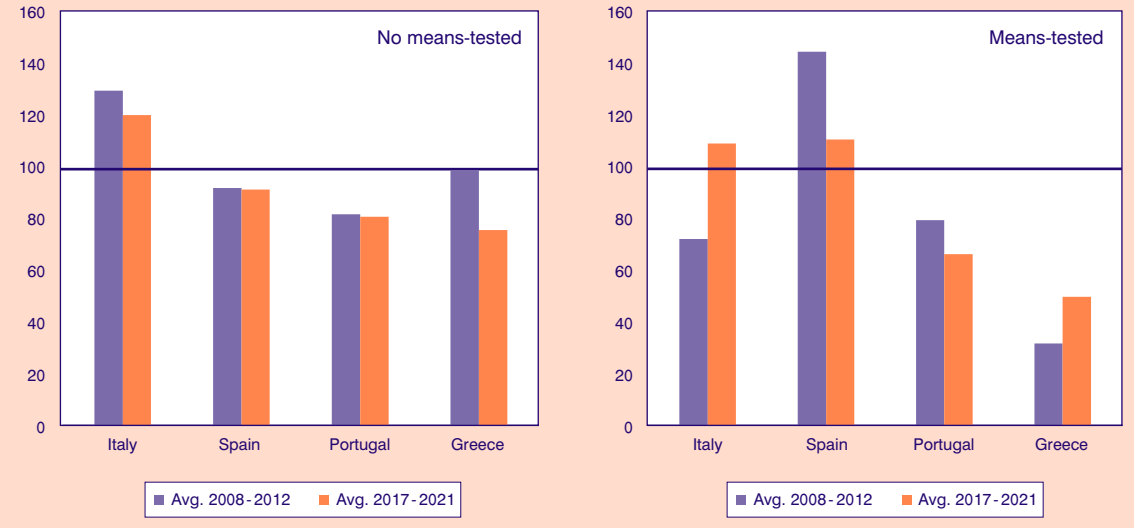
remarkable resilience in its welfare state provisions. In contrast, Spain's expenditure trajectory depicts a more nuanced pattern, characterized by a stable yet mild divergence in the purchasing power of expenditure. Initially closely aligned with the EU27 average, Spain's trend suggests a gradual widening of the gap over time, indicating a gradual deterioration in the purchasing power of its welfare state expenditure.

Meanwhile, Portugal presents an intriguing case, exhibiting a noticeable decline in the value of protection expenditure over the years. Despite this decline, Portugal manages to maintain a relatively stable longitudinal trend, hovering around 80% of the European average. This suggests a concerted effort to mitigate the impact of austerity measures while striving to uphold a certain standard of social protection for its citizens. Conversely, Greece's expenditure trajectory reveals a stark downward trend in the relative value of protection expenditure, signaling pronounced divergence from the EU27 average. The imposition of stringent adjustment measures, particularly in the aftermath of the 2008 financial crisis, appears to have taken a significant toll on Greece's welfare state provisions.[2] Since 2008, when social protection expenditure per capita closely mirrored the European average, Greece has experienced a notable decline, remaining at a level of 70%—a substantial deviation from its European counterparts and well below that of Portugal.

Figure 3.2.2 is based on the same methodology for presenting the data, providing a detailed breakdown of per capita social protection expenditure, differentiating between *means-tested* and *non-means-tested* provisions. This distinction sheds light on the evolving nature of the welfare state, particularly the transition from a traditional "Southern European" model to a more liberal framework. Central to this transformation is the shift in how social transfers are administered, with a notable transition from universally provided benefits to a system increasingly reliant on means-testing. This transition involves the introduction of eligibility criteria, such as income thresholds and marital status, to determine the allocation of social transfers and benefits.

The left-hand side of Figure 3.2.2 presents the pronounced decline in expenditure observed across Southern European countries. As anticipated, Greece emerges as the most affected, experiencing a substantial reduction of approximately 35 percentage points in expenditure allocated without means-testing of beneficiaries' resources compared to the EU27 average. This category represents a significant portion of total

FIGURE 3.2.2
Per capita social protection expenditure in purchasing power standards (PPS). Distinction between "no means-tested" and "means-tested" average 2008-2012 and 2017-2021



Source: Eurostat.

2. Missos V. (2021), Introducing a safety net: The effects of neoliberal policy on welfare, poverty and the net social wage during the Greek crisis, *Review of Radical Political Economics,* 53(1), 58-76, <https://doi.org/10.1177/0486613420930830>.

expenditure, encompassing expenditures on pensions and other essential benefits critical for social security. The drastic reduction in this category underscores the significant impact of austerity measures and fiscal consolidation efforts implemented in response to the economic downturn.

Similarly, Italy also registers a noteworthy decrease in means-tested expenditures, albeit to a lesser extent than Greece. Despite this decline, Italy maintains significantly higher per capita expenditure levels than the EU27 average, reflecting its historical commitment to robust social protection systems. However, the declining trend in this category signals a shift towards a more means-tested approach to social protection, indicating broader changes in the welfare state's architecture and the distribution of social benefits.

The right-hand part of Figure 3.2.2 illustrates the scenario concerning means-tested expenditures, revealing notably higher levels of inequality between countries. In several EU27 countries, such as Denmark, Sweden, and the Netherlands, the social protection systems operate on a fundamentally different policy reasoning, where income plays a central role in determining eligibility for benefits. Consequently, this specific category of the benefit mix exhibits significant disparities. However, trends in average expenditure over time, particularly in countries like Italy and Greece, provide insights into the direction of reforms aimed at reshaping the nature of the protection system.

Italy demonstrates a substantial relative increase, rising from 72 to 109. Conversely, Greece's increase from 32 to 50 remains comparatively low, significantly trailing behind the EU27 average. Meanwhile, Spain and Portugal display changes in per capita expenditure attributable to means-testing resources, reflecting these countries' inclination to maintain the existing systems of social protections and the overarching structure of their social welfare.

To sum up, the analysis of social protection expenditure patterns highlights the complex interplay between policy reforms, economic conditions, and social outcomes in shaping the welfare state landscape across Southern Europe. The transition towards means-tested allocations underscores the broader shifts in social policy paradigms and the challenges posed by fiscal constraints and austerity measures in maintaining inclusive and equitable social protection systems. A close review of the social protection expenditure trajectories shows the diverse and multifaceted experiences of Southern European countries in navigating the challenges of fiscal austerity and economic restructuring. While some countries exhibit remarkable resilience and stability in their welfare state provisions, others face significant challenges and divergent trajectories due to the complex interplay of economic, social, and political factors shaping the evolution of social protection systems in the region.

4. Reforms-Economic development

KEPE, *Greek Economic Outlook,* issue 53, 2024, pp. 50-53

4.1. Recent developments in the digital transition of the Greek economy

Athanasios Chymis

4.1.1. Introduction

Despite relatively positive developments in the Greek economy during 2023 in terms of economic growth, the trajectory of the digital transition index continues to be less than encouraging as it remains at 25th place in 2021 and 2022. Significant changes have been made to the DESI 2023 to align with the Digital Compass. As a result, it no longer ranks European countries on the whole index, nor in its four dimensions. It only provides rankings based on each of the individual indicators. Consequently, all indicators are presented here and the relative ranking for 2022 is provided so that the comparative evolution of each sub-index becomes apparent.

4.1.2. Recent developments in the digital transition

As the relevant methodological note of the European Commission (2023) explains, the decision on the Digital Decade Policy Programme adopted by the Commission and the European Parliament in December 2022 gives the indicator its new role, namely, to monitor the progress of the EU27 on the Digital Decade goals. DESI is now included in the report on the Digital Decade and is used by the Commission to monitor the progress of the Union and the member states in various dimensions and across a multitude of variables (indicators) related to digital transformation.

The DESI index, further adapting to the Digital Compass, slightly changes the names of the four dimensions and enriches the indicators they contain. An important change is that DESI ceases to be published as an overall index. This means that countries are no longer ranked based on DESI; rather, they are ranked based on each of the 34 indicators included in DESI. As mentioned, DESI has four dimensions: Digital skills, Digital infrastructure, Digital transformation of businesses, and Digitalization of public services (Table 4.1.1). It is noted that the index data refer to at least one year back.

Digital skills refer to the population of each state and include 9 indicators. We notice that despite the significant percentage of the population that uses the internet, Greece remains in a relatively low position since the corresponding percentages in most member states are higher. The increase in the percentage of companies providing ICT training is a positive development; however, Greece ranks at relatively low positions compared to the European average.

Worryingly, the percentage of ICT specialists has fallen, and thus Greece ranks last (27th). Moreover, ICT graduates remain at the same percentage of university graduates while the European average has increased. As a result, the Greek economy has lost ground and has fallen in ranking. The percentage of female Greek ICT specialists is the only parameter of the specific dimension of DESI in which Greece exceeds the European average.

In terms of digital infrastructure, the country seems to be divided into two categories. It is far behind in terms of network speed and capacity while it is quite ahead in terms of 5G network development. Specifically, in high speed (100Mbps, 1Gbps) fixed broadband as well as very high capacity network coverage, the country ranks last, with a large distance from the European average. In fact, any improvement that occurred between 2022 and 2023 was not enough to "unhook" Greece from 27th place. On the contrary, in terms of 5G coverage and spectrum, the country is among the first positions, with higher percentages than the European average.

In the dimension of digital transformation of businesses, which mostly concerns the private sector, there is a clear deterioration in 2023. Despite the increase in the percentage of small and medium enterprises (SMEs) with at least a basic level of digital intensity, Greece's position fell to last place because other member states

TABLE 4.1.1 DESI 2022 and 2023 indicators

	DESI 2022			DESI 2023		
	Greece	EU27	Rank	Greece	EU27	Rank
Digital skills						
Internet use	77.1%	87.2%	26	81.9%	88.6%	25
At least basic digital skills*	52.5%	53.9%	17	52.5%	53.9%	17
Above basic digital skills*	21.7%	26.5%	19	21.7%	26.5%	19
At least basic content creation skills*	62.3%	66.2%	19	62.3%	66.2%	19
Enterprises providing ICT training*	12.0%	19.7%	25	13.4%	22.4%	24
Females having at least basic digital skills*	51.4%	52.3%	19	51.4%	52.3%	19
ICT specialists	2.8%	4.5%	26	2.5%	4.6%	27
ICT graduates	3.5%	3.9%	20	3.5%	4.2%	22
Female ICT specialists	21.0%	19.1%	10	20.3%	18.9%	13
Digital infrastructure						
At least 100 Mbps fixed broadband take-up	8.5%	40.6%	27	20.3%	55.1%	27
At least 1 Gbps broadband take-up	0%	7.6%	27	0%	13.8%	27
Fixed Very High Capacity Network (VHCN) coverage	19.8%	70.2%	27	27.9%	73.4%	27
Fiber to the Premises (FTTP) coverage	19.8%	50.0%	25	27.9%	56.5%	25
Mobile broadband take-up*	76.5%	86.5%	26	76.5%	86.5%	26
5G coverage	66.1%	65.8%	10	85.7%	81.2%	12
5G spectrum	99.2%	56.1%	5	99.2%	68.2%	5
Digital transformation of businesses						
SMEs with at least a basic level of digital intensity	38.8%	54.9%	23	41.2%	69.1%	27
Electronic information sharing*	31.9%	38.1%	19	31.9%	38.0%	19
Social media*	28.0%	29.3%	14	28.0%	29.3%	14
Big data*	12.9%	14.2%	12	12.9%	14.2%	12
Cloud*	15.2%	34.0%	25	15.2%	34.0%	25
Artificial Intelligence*	2.6%	7.9%	26	2.6%	7.9%	26
e-invoices*	-	32.2%	-	-	32.2%	-
SMEs selling online	19.5%	18.5%	13	16.9%	19.1%	19
e-Commerce turnover	10.6%	11.6%	13	7.3%	11.3%	22
Selling online cross-border	7.0%	8.7%	19	7.0%	8.7%	19

TABLE 4.1.1 (continued)

	DESI 2022			DESI 2023		
	Greece	EU27	Rank	Greece	EU27	Rank
Digitalization of public services						
e-Government users	69.5%	64.8%	18	80.5%	74.2%	19
Digital public services for citizens	52.4	74.6	25	64.6	77.0	23
Digital public services for businesses	47.6	81.7	26	73.7	83.7	24
Pre-filled forms	45.3	64.5	21	54.4	68.2	20
Transparency of service delivery, design, and personal data	48.8	62.3	23	52.4	64.7	21
User support	75.1	81.6	20	74.1	83.6	22
Mobile friendliness	82.0	92.0	25	84.6	93.3	24
Access to e-health records	-	-	-	60.7	71.7	22

Source: DESI 2023.

*Data of both years refer to 2021.
- No data.

increased their respective rates considerably more. Specifically, the EU27 average increased by 15 points, while Greece's score increased only 2.5 points. Although most indicators refer to data from 2021, it appears that businesses in Greece are making significant use of social media and big data. However, in cloud using and artificial intelligence they are quite behind their European partners. They also seem to be losing ground in selling online and, consequently, in e-commerce turnover.

The dimension of digitalization of public services concerns the public sector and is the only one of DESI's four dimensions in which Greece shows a relative improvement compared to DESI 2022. It is interesting that despite the significant increase in the percentage of e-governance users and even though this percentage is above the European average, Greece's position fell one place to 19th. This is explained by the fact that countries closely behind Greece (such as Cyprus and Slovakia) increased their score more than Greece did. Another notable point about this indicator is that the EU27 average is far behind the middle position in the ranking. This is the case because a few populous countries (i.e., Poland and Germany) have significantly lower rates of e-government users, thus pushing the European average downwards. All other indicators are not measured as a percentage but as a pure number between 0 and 100.

Greece improved its ranking in digital public services for citizens and businesses, in pre-filled forms, in the transparency of service delivery, design, and personal data, as well as in the degree of mobile friendliness of the provided e-government services. The country is in most indicators of this dimension quite close to the European average, which shows the significant improvements of the Greek public sector digitization in recent years. Furthermore, it is encouraging that Greece's progress in most indicators is faster than the EU27 average, resulting in a rise in the ranking and convergence with the EU27. This is something that the new DESI focuses on (the digital convergence of the member states).

4.1.3. Concluding remarks

Despite the significant progress that has been made in several areas of digital transformation, the country continues to lag significantly behind its peers and, of course, to be far from the European average in most indicators. Particular attention needs to be paid to the digitization of the private sector, which seems to be wid-

ening the gap with the other member states and, consequently, falling to the lower ranking positions.

The digitization of the public sector appears to be progressing at a relatively faster pace than the rest of the EU27, resulting in the country's convergence with European averages in most indicators. Digital infrastructure needs special attention and network upgrades should be accelerated because Greece not only lags in network speed and capacity, but the progress it makes is relatively slower than that of the rest of the member states. Consequently, it remains firmly in the last ranking positions of the relevant indicators.

Finally, particular attention should be given to two indicators of the digital skills dimension. The number of ICT specialists as well as ICT graduates should increase. These two indicators are very important as they relate to the education and the ability of the domestic workforce to meet the ever-increasing labor market needs for a skilled digital workforce. In these specific indicators, Greece is losing ground in relation to its EU partners, and this is very worrying for future developments in the labor market. If domestic and foreign companies operating in Greece cannot find domestic skilled labor, there is a serious possibility that they will leave the country and settle in other EU member states where finding ICT specialists may be easier. This will have very negative consequences for the Greek economy in general, especially during the current phase where a significant effort is being made to attract foreign direct investment.

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KEPE, *Greek Economic Outlook,* issue 53, 2024, pp. 54-75

From Basel I to Basel III in the banking system: A brief theoretical presentation

Yannis Panagopoulos*

Summary

In this article, the regulatory framework which covers the credit institutions' operation over time is briefly presented targeting banking stability. That is, the main initial directives of Basel I (BCBS, 1988, 1996 & 1998) are presented, which appear before the existence of the euro, as well as the main changes published by the Basel Committee on Banking Supervision (BCBS), which became known as Basel II (BCBS, 2004 & 2006), but also the changes established as Basel III (BCBS, 2011, 2016, 2017, 2018, 2019 & 2021). In the framework of Basel III, the accompanying liquidity rules for banks are also presented (BCBS, 2013 & 2014). Finally, in conclusion, there is some criticism of this continuous effort for this rigorous regulatory control of the banks.

Keywords: *Basel I/II/III, Capital requirements, Liquidity, Banking system*

JEL Classification: *G21, G28*

1. Introduction

The advent of Basel I in 1988 was not accidental. It was mainly related to the rapid development and gradual internationalization of the credit system and of financial instruments, which gradually began from the mid-80s onwards. Starting from the USA, it was Aglietta (1996) who pointed out that apart from the very low capital ratio of the banks,[1] in relation to the Balance Sheet assets, some further problems were created by a significant credit expansion that was not accompanied by corresponding guarantees of collateral. In the same period ('80s), we have the widespread appearance of new types of bank liabilities, such as certificates of deposit (CDs), which could finance broader "credit exposures" of the banks. However, these new liabilities were more volatile, in terms of value, than the traditional means used for lending (e.g., customer deposits). An important role, among others, for this tricky situation was also the increase in banking competition, which negatively affected the returns on bank loans. All this, as Aglietta also pointed out, led to a downward credit rating of commercial banks after the mid-80s, not only in the USA, but also in the United Kingdom. This fragile situation led to the initiative undertaken by the Basel Committee on Banking Supervision (BCBS hereafter) for an international "convergence" of the main rules for calculating the capital requirements of banks in the developed economic world (Gortsos, 2011).

In the following sections 2 to 4, we present the main directives and then their changes and/or supplements from the original Basel I to those of Basel III. This can be considered as an extension of the article by Sbârcea (2014) as well as the article by Vousinas (2015) on the credit risk, market risk, operational risk, and capital adequacy. Section 5 also presents the additional liquidity rules that were specifically linked to the Basel III directives. Finally, in section 6, there are some brief criticisms of this continuous effort for the rigorous regulatory control of the banks.

2. Origins: The general principles of Basel I

2.1. The calculation of credit risk

2.1.1. BCBS, 1988

The BCBS in 1987/8 initiated a process which required the imposition of different weights on different types of

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

1. Based on the analysis of Jordà et al. (2021), the relatively low capital ratio of banks was a post-war characteristic of the developed world.

credit expansion for all countries with a developing financial system. This was made possible through an algebraic transformation of the various elements within the Balance Sheet (assets), so that they take the form of a measurable credit risk ("credit exposure") of the Balance Sheet. Thus, for the first time, the relationship between the capital requirements of the equity funds and the total weighted assets of the banks (TRWA)[2] was revealed. In fact, four (4) credit risk categories were initially created (see Table I1, Annex I). In addition, there were several weighting factors for the off-Balance Sheet assets of the banks (see Table I2, Annex I). The obvious purpose of the specific classification and weighting off and on Balance Sheet assets was an attempt, through supervision, for a homogeneous treatment of the credit risk of the banking institutions of the ten most developed countries (G-10). In addition, the first simple form of credit risk calculation with the corresponding mitigation offered by a certain financial collateral appeared.[3] The final date of implementation of the first edition of the Basel [BIS] Committee was set at 31-12-1992.

2.1.2. BCBS, 1998

With the BCBS edition of 1998, in the analysis of credit risk, the value of the mitigation of a bank's assets was added with more detail. More accurately, the bank's real exposure to an asset was clearly influenced by the valuation of its financial guarantees, which, however, at the same time were instruments of its trading book.[4] The valuation of these financial tools (or guarantees) was calculated in detail following the two parts of the *current exposure* method.[5] More analytically:

- the total replacement cost from the "closing" of the contracts to which the bank is exposed with its counterparties at current prices plus
- an additive ("add on") term, based on the residual future value of these financial contracts or products, multiplied by a given exposure factor (see Table I3, Annex I).

The second part, i.e., the future exposure (the "add on" factor), was calculated based on the nominal value of the financial contract with a coefficient that was affected by the time until this contract's maturity. Its added value is, of course, related to the fact that a financial contract until its expiration includes volatility, which is an element of the risk.

2.2. The calculation of market risk

2.2.1. BCBS, 1996

In the BIS Commission's original edition (BCBS, 1988), the question of market risk was not highlighted until later (BCBS, 1996). But we could say that in the 1996 edition, there is a detailed discussion on how to calculate risk from exposure to a series of financial products in the trading book, such as interest rates, foreign exchange, gold, tradable products, and shares, etc. With this edition, a more detailed presentation regarding the resulting capital charges begins in relation to market risk.[6] This risk was mainly related to losses from the financial products —due to changes in their prices— which were included in the trading portfolio of banks. The use of alternative methods of assessing the market risk[7] was also presented in detail in this

2. The total weighted risk (TRWA) of a bank's Balance Sheet had the following simple algebraic form:

$$TRWA = \sum_{i=1}^{n} \{[W_1 \times E_1] + [W_2 \times E_2] + \ldots + [W_n \times E_n]\} \qquad i = 1 \ldots n$$

where: *TRWA* (total risk weighted assets) was the sum of the weighted assets of a bank; E_i was an individual Exposure (e.g., asset without compensation by a guarantee) of the bank's Balance Sheet; W_i was an attached weighting factor to each category of the bank's assets.

3. Algebraically, the simple form of credit risk calculation with the corresponding mitigation offered is

$$E_i^f = \max\{0, [E_i - C]\}$$

where: E_i^f refers to the bank's Exposure (as an amount) of a specific Asset, i, after its hedge with an existing guarantee, E_i refers to the Exposure (as an amount) of the specific Asset before its final hedge with a guarantee, C refers to the amount of the specific financial guarantee for the credit hedge.

4. In this way, the valuation of financial products (tools) concerns both credit and market risk.

5. There were other methods of calculating market risk (e.g., the *original exposure* method) but the *current exposure* method was mainly recommended.

6. Of course, the market risk, although it was calculated as a capital charge, was not yet expressed in the denominator of the banks' capital adequacy ratio.

7. The market risk for each bank's trading portfolio contained the following elements: interest rate risk, equity risk, foreign exchange risk, commodity risk and option risk.

BCBS edition. These methods were the following two: a) the *Standardized Measurement* method (SMM) and b) the *Internal Models* method, which included the use of the *Value-at-Risk* [VaR] approach. Finally, in the same edition, it is pointed out that the supplementary capital (Tier III) was initially introduced by the BIS Commission for this purpose.

2.3. The calculation of capital adequacy

2.3.1. BCBS, 1988

Another element that the BIS Commission defined with this edition was the precise determination of the elements of the equity that constitute the capital of the banks. More specifically, by the end of 1992, in terms established by the 1988 Accord, banks' equity was classified as Core capital or Tier I and Supplementary or Tier II. Core or Tier I capital contained the following two (2) elements:

- Paid-up capital/common stocks and
- Reserves (disclosed reserves).

As regards the Supplements funds or Tier II, they consisted of the following five (5) elements[8]:

- Undisclosed reserves
- Asset revaluation reserves
- General provisions
- Hybrid capital instruments
- Subordinated debt.

Now based on the weighted assets of the banks and the supervised funds (Tier I and II), the minimum capital requirement was determined to satisfy the following simplified capital adequacy ratio (CAR):

$$\frac{Tier\ (I\ \&\ II)}{\sum (Risk\ Weighed\ Assets)} \geq 8\% \qquad (1)$$

Note: includes On- and Off- Balance Sheet convertible assets.

Inequality (1) should, by the end of 1992, be equal to or greater than 8%. In other words, the supervised equity capital of the bank should be equal to or greater than 8% of the weighted position of the credits of the bank's assets.

2.3.2. BCBS, 1998

In this improved edition of Basel I, there was mainly a more extensive presentation of how the individual elements of the equity capital of each bank should be composed. This mainly included a breakdown of equity into core funds (Tier I), supplementary funds (Tier II) and additional supplementary funds (Tier III). Annex VI presents these data in more detail.

3. From Basel I to Basel II

The transition from Basel I to Basel II capital requirements followed a series of individual directives that resulted in a comprehensive version, by the BCBS, which became known as "Basel II: The Revised Framework: a comprehensive view' [BCBS (2006)[9]]. As Borowicz (2023) points out, all revisions began with the finding, by some BIS Commission economists, that the existing Basel I models underestimated the capital needs in case the probability of a financial crisis increased. Extensive consultation with representatives of the banking sector, supervisory organizations, central banks, and external observers also played an important role in this revision to develop, with the best possible way, the capital requirements adapted to each risk. The 2006 BCBS edition mainly dealt with upgrades in the way loan as well as trade portfolios of banks could be controlled.

In addition, Basel II contained the three (3) pillars for bank control. Specifically:

- Pillar I: Minimum Capital Requirements
- Pillar II: Supervisory Review Process
- Pillar III: Market Discipline.

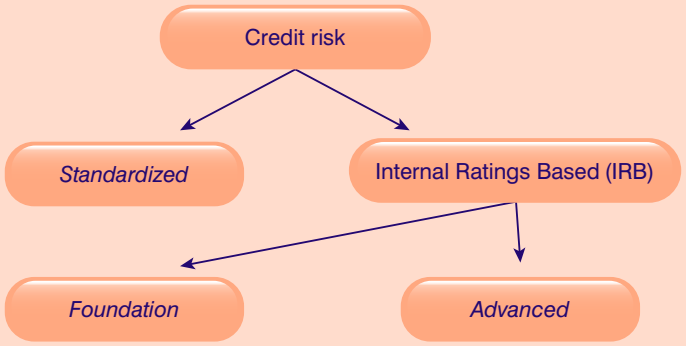
Starting from Pillar I, we should mention that the BCBS (2006) edition enriches the bank control with more categories and weightings of the assets, with different and more complex ways of algebraically determining the required equity capital. In addition, we had the introduction of the concept of operational risk in the analogous calculation of the capital requirements.

But the BIS Committee in the 2004 and especially in the 2006 editions (BCBS, 2004 & 2006) did not simply limit themselves to the creation of some new credit risk weighting categories but, as we already mentioned, enriched the way of calculating the capital require-

8. BCBS (1996) also makes the first optional reference to the existence of supplementary funds (Tier III) with quantitative restrictions vis-à-vis the other funds, Tier I and II.

9. The BCBS (2006) edition, as noted on the cover paper, essentially contains the editions: BCBS (1988, 1996 & 2004).

DIAGRAM 1
Methods of calculating credit risk based on Basel II



Source: Panagopoulos & Peletidis (2007).

ments against the banks' credit risk with two (2) new methodologies: the *Standardized* approach and the *Internal Ratings Based* (IRB hereafter) approach. In fact, the IRB approach was further subdivided into the *Foundation* approach and the *Advanced* approach. Diagram 1 shows the interconnection of the above methodologies in the calculation of credit risk.

Below we will briefly present the different methodologies that led to the quantification of credit risk in different asset categories, which primarily affected the quantitative result of the denominator of inequality (2) [see section 3.4.1] and, by extension, the required numerator, e.g., Tier I, in the banks' capital adequacy ratio (CAR) to keep the minimum capital requirement rate at 8% at least.

3.1. The calculation of credit risk

3.1.1. BCBS, 2006

3.1.1.1. In the Standardized method

Based on this Basel edition, in the case of using the specific methodology to calculate the weighted credit risk of a bank, specific steps were proposed that should be implemented. In more detail, each asset of the loan portfolio that contains credit risk was weighted with risk coefficients that differ based on:

- the type of creditor, e.g., whether they are governments, central banks, development or commercial banks, financial firms, businesses, or individuals,
- the evaluation of the creditor has been carried out by highly approved international financial houses, such as e.g., Standards & Poor's or Moody's.

3.1.1.2. In the Internal Ratings Based approach-IRB

In the case of using the IRB methodology to calculate the weighted credit risk a bank could implement, as shown in Diagram 1, it is subdivided into two (2) individual approaches: The *Fundamental* and the *Advanced* approach.

These two (2) individual approaches differed in the way of calculating the bank's risk weighted assets (RWA thereafter) and, by extension, the corresponding capital charge. In more detail, both IRB approaches used three (3) parameters to assess the credit risk of the bank's assets: the probability of default (Probability of Default-PD) of the counterparty, the loss in case of default (Loss Given Default-LGD) of the counterparty and the exposure in case of default (Exposure at Default-EAD) to the counterparty. However, in the case that the *Fundamental* approach is applied, the bank could use its own estimates regarding the parameter (PD) but relied on external methods to estimate the other two parameters in the determination of credit risk (i.e., EAD and LGD). On the other hand, in the case of using the *Advanced* approach, the bank could use its own estimates for all three (3) parameters (PD, EAD and LGD) in the calculation of the RWA as well as its capital charge.

3.1.1.3. In Securitization

An important element introduced by the BIS Commission, through this specific edition, was the crucial issue of retaining or not some capital charge in case of banking involvement in securitizations (see Albertazzi, et al., 2011). This operation begins with the sale of some as-

sets of a bank (mainly loans) to a special purpose entity (SPV) which "converts" them into different classified bonds and then makes them available to potential investors. This way, we have a direct money flow from the bank which, as is known, is accompanied by a zero-risk factor. In fact, two (2) main categories of securitization were recognized: *Traditional* and *Synthetic.*[10] In the case that the banks were involved, directly or indirectly, in the purchase of these rated bonds from the securitization, they were obliged to calculate the weighted risk of these bonds to keep the correct proportional charge in their equity (Tier I & II).[11] In addition, as with the simple loans, there were respectively two (2) categories for the evaluation of these rated bonds in the securitization: the *Standardized* and the *IRB* method.

3.2. The calculation of market risk

3.2.1. BCBS, 2006

The market risk here was nothing more than the repetition of the 1996 BCBS edition. However, the calculation of the market risk was now also presented in the denominator of the new capital adequacy ratio [see inequality (2), section 3.4.1].

3.3. The calculation of operational risk

3.3.1. BCBS, 2006

By the term "operational risk" the BCBS (2006) edition referred either to the inefficiency of the bank's internal operations or to external events that negatively affected the bank.[12] As in the case of credit risk, different ways of measuring operational risk were reported. More specifically, we had three (3) methods of approaching operational risk:

- the *Basic Indicator* approach
- the *Standardized* approach
- *Advanced Measurement* approaches.

The BCBS (2006) allowed a bank —provided certain minimum criteria were met— to use the *Basic Indicator* approach for some simple activities and the other two approaches for some more sophisticated activities. Briefly, the *Basic Indicator* approach was a methodology whereby banks held capital at a percentage (e.g., 15%) of the average positive income (gross income) on their Balance Sheet for the last three years of its operation. In the case of the *Standardized* approach, the operational risk was not treated uniformly by the bank with a fixed rate but was based on the subdivision of the bank's activities. The bank would have to subdivide its activities into six (6) sub-sectors and assign a different coefficient to each of them. The sum of these coefficients essentially replaced the total coefficient of the *Basic Index* approach. Additionally, in the calculation of the retained funds in the equity, the cumulative result of the weighted, with a 3-year average, incomes of the individual business activities of the bank were used. Finally, regarding *Advanced Measurement* approaches, recognizing the advanced internal procedures of certain banks, the BIS Commission allowed, under certain conditions, the internal assessment of operational risk using mathematical models, like those that existed in the credit risk calculation.

3.4. The capital adequacy ratio in Basel II

3.4.1. BCBS, 2006

Based on all the above analysis, the new (improved) expression of the minimum capital requirement now had the following algebraic form (CAR):

$$\frac{Tier\ I}{\{Credit\ Risk\} + \{Market\ Risk\} + \{Operational\ Risk\}} \geq 8\% \qquad (2)$$

The inequality (2), which stands as a Capital Adequacy Ratio, like in the case of Basel I, was equal to or greater than 8%. In other words, the supervised capital of the bank should be equal to or greater than 8% of the sum of weighted credit, operational and market risks.

In relation to the existing Basel I commitments, Basel II further specified the following main restrictions:

- Any Tier III capital was fully paid short-term subordinated capital with an initial duration of at least two years without the possibility of early repayment and with a binding condition of non-payment of interest and principal at maturity if such payment would

10. For a detailed presentation of these two forms of securitization, see Maroulis (2004).

11. When, for example, they participate in the market for rated bonds from a *traditional* securitization or when they used credit derivatives to cover the credit risk position in case of a *synthetic* securitization.

12. Operational risk also includes sections such as legal risk, i.e., effects from various penalties that may be imposed by the central bank, for example.

reduce the bank's capital requirements below the permitted settings by the BIS Committee.

- The ratio of retained capital between Tier I and Tier III should be 28.5% and 71.5%, respectively, for the bank's exposure to market risks.

We proceed below to a very brief presentation of Pillars II and III, which were something new in relation to the Basel I directives and were mainly related to banking supervisory control and market discipline procedures.

3.5. Pillar II (Supervisory Review Process)

3.5.1. BCBS, 2006

The purpose of Pillar II was, firstly, to ensure the managerial capability of the banks and, secondly, to improve the risk management techniques on their portfolios. Through this supervisory review, the BIS Commission intended to develop the best possible cooperation between the central bank and the commercial banks with the aim of taking decisive measures, by the latter, to achieve the most accurate matching of any risk with the equity held by the banks. It was even pointed out that a reduction in any risk was not only linked to quantitative movements. There was always the possibility of better management of the risk by the bank and this could well be attained with a proper supervisory review of the procedures, with the imposition of internal limits and the existence of external controls.

In addition, Pillar II was designed to deal with the problems raised both by risks not already faced by Pillar I (e.g., bank's concentration risk), but also risks not discussed in it (e.g., strategic risk) or other exogenous factors (e.g., effects of economic cycles). Finally, another interesting element highlighted by Pillar II was the evaluation of banks' compliance with the requirements (standards) which the use of *Advanced* risk assessment methods set in Pillar I [such as, e.g., the use of the IRB approach for credit risk and the use of the *Advanced Measurement* methods for operational risk].

3.6. Pillar III (Market Discipline)

3.6.1. BCBS, 2006

The specific section dealt with the necessity, frequency, and quality of the disclosure of data related to banks' capital adequacy. This publication also allowed for a better understanding by the investors of the risks that banks undertake in the framework of "market discipline". As BCBS (2006) explicitly remarks, Pillar III is called upon to play a complementary role vis-à-vis the capital requirements of Pillar I and as an overview of Pillar II processes.

Regarding the issue of announcing any "sensitive" information, within the framework of Pillar III, the Board of Directors of each bank undertook the responsibility to approve the information to be published. In the framework of Pillar III, extensive information was given by each activity sector of every bank, both in terms of the qualitative and the quantitative part of the notifications that banks should publish.

4. From Basel II to Basel III

The analysis here begins with the basic edition of Basel III (BCBS, 2011) and then proceeds to the more up-to-date editions (BCBS, 2016, 2017, 2018, 2019 & 2021). As in the previous case of Basel I vs. Basel II, the main changes in the calculations of individual risks and their analogous capital requirements are described here.

Before proceeding to a more detailed presentation of the changes brought about in Pillar I of Basel III, it would be useful to mention the reasons why the BIS Commission was led to them. The first was the observed over-leverage on which the financial crisis was "based" in the international banking system (see Papanikolaou & Wolff, 2010); the second was the lack of sufficient liquidity (see Acharya & Mora, 2015) and the third an obvious procyclicality that defined the previous system of credit risk calculations (see Thomadakis & Loizos, 2011). Thus, the adoption of internal risk rating systems, within the framework of Basel II, for the loans of developed banks (e.g., the IRB method), allowed, during the economic boom, the easing of the capital requirements while during the economic recession, allowed some further credit reduction.

As BCBS (2011) explicitly mentions, the purpose of this new revision was:

1. The prevention of excessive cyclicality in capital requirements.
2. The promotion of longer-term forecasts.
3. The creation of a "buffer" of conservation funds in the banking system so that the predicted loses of extreme scenarios by the stress tests could be adequately faced.
4. The achievement of a long-term prudent policy of credit expansion of the banking system in relation to an excessive one.

Thus, regarding the first revision (1), of the excessive cyclicality, the BIS Committee proposed a review of

the use of the probability of default (PD) in the calculation of capital adequacy on a new, less cyclical basis, within the IRB methodology, to achieve a more moderate credit expansion.

Regarding the second revision (2), of the calculation of the promotion of longer-term forecasts, the BIS Committee proposed an improved method to calculate the expected losses (EL) for achieving a shorter possible economic cycle.

On the third revision (3), of the creation of a "buffer" of conservation funds, the BIS Committee proposed the operation of a gradually increasing holding of funds above the known limit of 8% to deal satisfactorily with unexpected adverse events.

In the fourth revision (4), of the long-term restraint of the banking system from an excessive credit expansion, the BIS Committee —as shown in Table 1— proposed the possibility of adjusting the "buffer" of conservation funds based on the progression of the economy. In simple analysis, it was proposed to reduce the "buffer" of conservation funds to a near-zero level in normal economic periods and gradually increase it in a period of excessive credit expansion or in a period of anticipated economic crisis.

4.1 The calculation of credit risk

4.1.1. BCBS, 2011

The general credit risk assessment framework, as detailed in the BCBS (2011) edition, is broadly the same as the BCBS (2006) edition. What changed substantially in the credit asset assessment was mainly related to the review —through the procedures of credit value adjustments [CVA]— of the way the counterparty risk was calculated, both when the banks were able to use the *Internal Models* method (IMM) as much as when this possibility did not exist.

Thus, in the edition of BCBS (2011), the algebraic ways of re-examining credit asset assessment, in terms of the corresponding capital requirement, due to the losses produced from the special categories of complex financial assets, arising from the bank's counterparties, were presented in detail. In fact, if there was no approval for the use of IMM for calculating the risk of the counterparty, then the bank was compelled to follow a pre-calculated, from an international financial organization, Table with the weighting risk(s) of the counterparty. Another notable differentiation, in relation to Basel II, was a small change in the *Correlation* equation, in the calculation of credit risk (equation (A1), Annex III[13]), when there is a loan exposure of the bank to financial institutions that fulfill some institutional as well as financial conditions. Finally, an additional notable differentiation had to do with redefining the risk of the counterparty [of the bank] through frequent stress tests and scenario analysis to avoid what in the literature is called "wrong-way risk".[14]

4.1.2. BCBS, 2017

The reasons that led to the revision of the BCBS (2011) edition are stated at the beginning of the BCBS (2017) edition. In general, the intent of this revision was to further reduce the volatility of the banks' RWAs as well as to generally enhance the accuracy of risk calculation through the *Standardized* approach for both credit and operational risks. In addition, the BCBS (2017) version limited the possibility of using IRB models[15] in the calculation of credit risk by banks, as it also proceeded to a further review of the method of calculating credit risk due to counterparty risk (credit value adjustments-CVA) by banks.

4.1.2.1. In the Standardized approach

The main feature of the changes in the *Standardized* method of the BCBS (2017) edition, in relation to the *Standardized* method of the BCBS (2006) one, are essentially some changes in the categories of the banks' assets and in their corresponding weighting factors.[16]

4.1.2.2. In the Internal Rating Based approach-IRB

As in the BCBS (2006) edition, there is also a division into two (2) separate approaches: The *Fundamental* and the *Advanced*. In the case of the *Fundamental* approach, there have been a few changes in the assets categories (e.g., there is no such approach anymore for retail banking). In the use of the *Advanced* approach, the algebraic way of valuing the weighted risk

13. They [banks] should multiply the *Correlation* equation (A1) by a factor of 1.25 to calculate the corresponding capital adequacy.

14. This way a more precise definition of EAD was sought.

15. In the BCBS (2017) edition there is also a review of the weighted capital adequacy ratio, considering the renewed leverage ratio and the new levels of minimum capital.

16. Annex V presents in detail the main changes in the weighted assets categories between the two BCBS editions (2006 and 2017).

of the assets and the corresponding capital adequacy basically remained the same.[17]

4.1.2.3. In credit risk adjustment-CVA

A thorough analysis of credit assessment related to the review of counterparty value calculation (CVA) was carried out in the BCBS (2017) edition. As already mentioned, the counterparty risk is usually linked to market risk factors which can affect the prices of derivatives and of shares that usually constitute the collateral of the bank's counterparty. There are also two (2) approaches to assess the capital adequacy requirements for the credit risk of the banks' counterparty: The *Standardized* and the *Basic*. Banks are encouraged to use the *Basic* approach unless there is approval to use the *Standardized*.

4.2. The calculation of market risk

4.2.1. BCBS, 2016

In the BCBS (2011) edition, we had no major changes in the calculation of market risk. But with the BCBS (2016) edition, there were a few important changes. In more detail, we had:

- the improvement of the *Standardized* approach,
- the improvement of the *Internal Model* approach (IMA),

as well as,

- the change of the *VaR* (Value-at-Risk) approach with the "expected shortfall" (*Expected Shortfall*-ES) approach in case of market risk measurement under financial crisis conditions (Financial Stress Tests),
- the incorporation, in the market risk, of the risk created by the lack of liquidity,
- the reassessment of the limits that separate the trading from the corresponding loan portfolio.

In the first case –the *Standardized* approach– the BCBS (2016) edition states that the methods of assessing the market risk are applied through the sum of three (3) methodologies: the *Sensitivities* method, the *Default Risk Charge* method, and the *Residual Risk Add-on* method. In the second case –of the *Internal Model* approach– we also have the summation of three (3) individual methodologies, implemented only after the approval by the monetary authorities. These are: the *Expected Deficit* method, the *Bankruptcy Risk* method and the non-modelled *Idiosyncratic Risk Calculation* method applied during a period of crisis (a stressed capital add-on process).

4.2.2. BCBS, 2018

In 2018, the BIS Commission issued a new market risk dedicated edition that brought improvements to the calculation of the *Standardized* approach and the *Internal Models* approach. In the first approach (*Standardized*), the improvements were related to a) the determination of the exchange rates (FX), b) the review of the diversification of the bank's trading portfolio and c) the creation of shock scenarios for the calculation of capital requirement for potential exposure to complex financial assets. In the second case (of the *Internal Models*), additional control procedures appeared such as a) the examination of the performance of the managers regarding the bank's trading portfolio (a PLA test)[18] and b) a better explanation process of how to calculate the non-modelled *Idiosyncratic* risk, especially under financial crisis scenarios.

4.2.3. BCBS, 2019

In 2019, the BIS Commission proceeded again to publish an exclusive edition on market risk. This edition provided some detailed explanations on individual topics of market risk calculation, as a supplement mainly to the BCBS (2016)[19] edition.

4.3. The calculation of operational risk

4.3.2. BCBS, 2017

The BCBS (2017) edition mentions three (3) new methods of approaching operational risk which replaced the existing methods from BCBS (2006). The new methods were:

- the *Business Indicator* (BI) index,
- the *Business Indicator Component* (BIC) index,
- the *Internal Loss Multiplier* (ILM) approach.

17. See the five (5) equations of Annex III in this regard.

18. Profit and Loss (P&L) attribution test.

19. More specifically, for issues related to the boundaries between the trading and the loan portfolio(s). Additionally, for terminology issues regarding: the market risk, the use of the *Sensitivity* method, the use of the *Residual value* method, and the use of the *Internal Models*.

The *Business Indicator* index is an algebraic equation for operational risk derived from banks' Financial Statements. It contains three (3) sections which involve: the interest rate, the dividend, and the leasing part, as one unit that embraces the operational and the financial procedure of the bank. In the case of the *Business Indicator Component* index, we have an index that is "built" based on the composition of the *Business Indicator* one. More specifically, three (3) different coefficients (%) are assigned to the *Business Indicator Component* index, which change according to the total amount obtained by the *Business Indicator* index[20]. Finally, regarding the *Internal Loss Multiplier* approach, we can state that it is a simple logarithmic function where the derived value triggers the corresponding capital requirement for operational risk. Specifically, the value taken by the *Internal Loss Multiplier* depends mainly on the difference of a Loss index (LC), created from the last ten (10) loss-making financial periods, in terms of the operational risk of the bank minus the value derived from the *Business Indicator Component* index.[21]

4.4. The calculation of capital adequacy[22]

4.4.1. BCBS, 2011

The expression of the minimum capital requirement as algebraically formulated in inequality (2) was unchanged in BCBS (2011). What has essentially changed in relation to Basel II is the intertemporal structure of capital requirements. Table 1 presents in detail these long-term requirements that Basel III incorporated regarding the supervisory capital of banking institutions in relation to their loan portfolios for several years (2013-2019).

Based on the data of Table 1, the gradually increasing relationship between the loan portfolio and the supervisory required capital of the banks becomes evident. The BIS Commission's intention was to contain

TABLE 1 Basel III capital requirements in the banking system

	2013	2014	2015	2016	2017	2018	2019
Minimum common equity capital ratio	3.5%	4.0%	4.5%	4.5%	4.5%	4.5%	4.5%
Capital conservation buffer				0.62%	1.25%	1.87%	2.5%
Minimum common equity plus capital conservation buffer	3.5%	4.0%	4.5%	5.12%	5.75%	6.37%	7.0%
Counter-cyclical activation level of capital conservation buffer				0%-0.62%	0%-1.25%	0%-1.87%	0%-2.5%
Minimum Tier 1 capital	4.5%	5.5%	6.0%	6.0%	6.0%	6.0%	6.0%
Minimum total 1 capital + plus conservation buffer	4.5%	5.5%	6.0%	6.62%	7.25%	7.87%	8.5%
Minimum total capital	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%
Minimum total capital + capital conservation buffer	8.0%	8.0%	8.0%	8.62%	9.25%	9.87%	10.5%

Source: BCBS (2011).

20. For example, for banking operations up to €1 billion the BIC coefficient is 12%. For an amount from €1 billion to €30 billion, the BIC coefficient becomes 15%, while from €30 billion and above, the BIC coefficient becomes 18%. So, if the BI index is, e.g., €35 billion, then the BIC index will be: 1 billion € ×12% + (30-1) billion € ×12% + (35-30) billion € ×18% = 5.37 billion €.

21. For example, when BIC= LC then ILM=1 as well as when BIC<LC then ILM>1 and vice versa. By extension, the more BIC<LC, the greater the requirement in the banks' equity capital for operational risk, and the more BIC>LC, the smaller this requirement becomes. In fact, as reported by BCBS (2017), the minimum operational risk capital requirement (ORC) of a bank is the product of the BIC ratio times the ILM (i.e. ORC=BIC×ILM).

22. For a detailed presentation of the changes and functioning of capital adequacy from Basel II to III, see Kalfaoglou (2012).

the recorded credit expansion of commercial banks internationally. In particular, the existence of a "capital conservation buffer" was an attempt by the monetary authorities to ensure —as best as possible— the avoidance of any financial crisis like that of August 2007. Additionally, for the very important international (G-SIBs) but also national (D-SIBs) banks, an upward change in loss provisions was proposed for reasons of further capital security (see Jones & Zeitz, 2017).

In more detail, the "capital conservation buffer" of 2.5%, on top of the "minimum common equity capital ratio" of 4.5%, was activated not by the establishment of losses in the bank in question, but in the stage of the capital distribution of its profits. In fact, in Table 2 below, the BCBS (2011) edition described the ways in which the bank's capital would be distributed according to the level of its capital adequacy. So, for example, a bank with a Tier 1 Ratio (CET1) at the levels between 5.12% to 5.75% was now obliged to "keep" 80% of its profits in the bank for the following years and "distribute" the remaining 20% in the form of dividends, shares, or bonuses. Accordingly, if it had CET1 at the levels between 6.37% to 7.0%, it was obliged to "keep" 40% of its profits in the bank for the following years and "distribute" the remaining 60%, etc.

In addition, the BCBS (2011) edition recognized the importance of the economic cycle and the consequences it brings to the credit expansion of banks. For this reason, it created a "countercyclical buffer" so that the capital adequacy of the banks consider the macro-financial environment in which the banks operate. According to the BCBS (2011), this "countercyclical buffer" would be calculated based on the following Tier 1 ratio (CET1) data:

a) The national authorities (e.g., the central banks) of each country would have to monitor the increase in credit expansion and judge accordingly whether it was excessive behaviour and were authorized therefore to activate the buffer. Its de-activation would be judged accordingly.

b) Banks with a multinational activity should consider the geographical environment in which they operate and calculate the "countercyclical buffer" as a weighted average of the individual buffers in the countries they operate.

c) The derived obligations of the particular "countercyclical buffer" for each bank would determine the size of the buffer accordingly. This consequently would also affect the amount of dividend that the bank could distribute later.

In the same edition (BCBS, 2011), the leverage ratio (LR) was presented, for the first time, which could be considered as a complementary part of what we call banks' capital adequacy. This leverage ratio had the following algebraic form:

$$LR = \frac{(Capital\ measure)}{(Exposure\ measure)} \geq 3\% \qquad (3)$$

In more detail, the numerator of the fraction of inequality (3) ("capital measure") consisted of Tier I funds (e.g., common shares). On the other hand, the denominator ("exposure measure") mainly includes Balance Sheet items, derivative products and shares that finance (or hedge) any purchases and sales of the bank as well as any off-Balance Sheet items which, however, are not weighted for risk.

4.4.2. BCBS, 2017

In this edition, a capital "output floor" appeared, below which banks should not fall in terms of their CAR. But

TABLE 2 Banks' minimum capital levels

Common Equity - Tier 1 ratio (CET1)	Minimum capital conservation ratios
4.5% - 5.125%	100%
>5.125% - 5.75%	80%
>5.75% - 6.375%	60%
>6.375% - 7.0%	40%
> 7.0%	0%

Source: BCBS (2011).

there were also some additional restrictions that had to be "satisfied" immediately. More specifically:

- The total amount of Tier I common stock should be at least 4.5% of the sum of the weighted assets in any case.
- The sum of Tier I elements should be at least 6% of the sum of the weighted assets in each case.
- The total capital (Tier I + Tier II) should be at least 8% of the sum of the weighted assets in any case.

In fact, the BCBS (2017) edition formulated an example of how to calculate the capital adequacy of a bank by comparing its total weighted risk before the imposition of a capital "output floor" and after it. It proposed the selection of the higher value of the two alternative results for the calculation of capital adequacy. For example, BCBS (2017) compared the required funds in the case the bank's weighted assets calculated differently (through either the *Independent*, the *Standardized* or the *Internal* method), taking into consideration that the result of the *Standardized* method times 75% represents the capital "output floor". The bank is obliged to use the higher value of the two results for the calculation of its capital adequacy. In the calculation of these two alternative cases, all types of risk should be incorporated (e.g., credit, securitization, credit adjustment, market, and operational risk). It also pointed out that the application of the above method for calculating the capital "output floor" would start from January 1, 2022, with a multiplication of 50% of the *Standardized* method and would gradually reach full application, with 75% of the *Standardized* method, on January 1, 2027.

4.4.3. BCBS, 2021

In the 2021 edition, which was published by the BIS Commission intending some further explanations on capital adequacy measurement (e.g., regarding the minimum common equity capital ratio and the gradual increase of 2.5% due to the "countercyclical conservation buffer"), the main Tables basically remained as they were in 2011, with some small changes.

5. The theoretical presentation of the liquidity channel in Basel III

In addition to all these changes, in terms of capital adequacy, Basel III —as an institutional framework— also focused on the importance of avoiding any liquidity crisis that could endanger the banking system. In macroeconomic terms, we refer to the existence of a liquidity channel. The specific channel is essentially connected to the bank's Balance Sheet and in more detail to the two (2) main elements of the structure of the bank's Balance Sheet: a) the different maturity time (maturity mismatch) between the assets and liabilities and b) with a potentially high degree of leverage in the banking system.

More analytically, it has been observed that many problems in the history of the banking system of various countries started either from over-leveraging assets or from a highly different level of maturity (maturity mismatch) between their assets and liabilities. The result of such extreme situations could be a liquidity shock, which could lead to a "bank run". In fact, as pointed out by the BCBS (2011) edition, in such financial situations, banks sell their assets, resulting in a further decline in their Balance Sheets and exacerbating the problem. Diamond & Dybvig (1983) were the authors who initially highlighted the mechanism as well as the liquidity shock, and Diamond & Rajan (2005) revealed the interconnection between liquidity shocks and the risk of an immediate bank failure. In fact, the latter two authors explained in detail in their article how a withdrawal of deposits from customers or a refusal to recycle the bank's debt to its customers can lead to an "aggressive" liquidation of otherwise profitable loans. This can lead to a fall in expected bank profits with serious further implications for the bank's future creditworthiness and survival (solvency).

Based on the above theoretical analysis, in the relevant banking literature, the need to immediately deal with such a form of liquidity crisis was revealed. In fact, two forms of liquidity problems were identified: one was related to the bank's ability to immediately find ways, through the sale of its assets, to repay the obligations which are derived from its liabilities (funding liquidity), and the other to a bank's ability to buy and sell its assets in the market (market liquidity). In fact, as mentioned by BCBS (2011), these two forms of liquidity risk could, under certain conditions, be interrelated and lead to an increase in the banks' credit risk.[23]

5.1. The introduction of liquidity rules in the banking system

Based on the risks of an immediate bank failure, which could come from a liquidity shock, the BIS Commission proceeded with a series of rules to strengthen the

23. See also Allen & Gale (2008); Brusco & Castiglionesi (2007); Strahan (2008), etc.

liquidity position of financial institutions. This question was introduced after the 2007 financial crisis, when many international banks found themselves with serious liquidity problems due to imprudent management from their managers.

Specifically, according to the BCBS (2013) and BCBS (2014) editions, two (2) additional ratios were defined which would control the liquidity of the banking system: the liquidity covered ratio (LCR) and the net stable funding ratio (NSFR), respectively.

Starting from the first ratio of the covered liquidity (LCR), we can briefly mention that it had the following algebraic form:

$$LCR = \frac{HQLA}{NCOR} = \frac{High\ Quality\ Liquid\ Assets}{Outflows - min(Inflows,\ 0.75 \times Outflows)} \geq 100\% \quad (4)$$

By the term "high-quality liquid assets", in the numerator of the inequality (4), the BIS Commission was referring mainly to cash, high-quality stocks and government bonds. All these items were considered immediately liquidable. On the other hand, the denominator essentially referred to net total bank outflows of 30 calendar days. Both outflows and inflows mainly had to do with immediately enforceable payments or collections (cash outflows and inflows) within a maximum period of 30 days.

The specific ratio was gradually implemented for the banking system. Specifically, the beginning of the international application was January 2015 at a level of 60% and then followed a progressive implementation up to 100% in 2019. Table 3 below shows us the time and quantitative process of implementation of the ratio by the banks, internationally.

The purpose of the ratio was to push banks to adopt a portfolio that would be able to be financed more easily, especially in critical periods. More specifically, a portfolio with significant exposure to low-risk and easily liquidable stocks or bonds, but also with only a few short-term loans. For the structure of bank liabilities, the BIS Commission recommended that banks rely less on deposits from the market and more on retail (banking) and non-financial corporations.

As for the second ratio, the net stable funding ratio (NSFR), it had the following algebraic form:

$$NSFR = \frac{Liabilities}{Assets} = \frac{Available\ Stable\ Funding\ (ASF)}{Required\ Stable\ Funding\ (RSF)} \geq 100\% \quad (5)$$

Regarding the numerator of the ratio (Available Stable Funding-ASF), we can mention that it included several elements of the liabilities which, as mentioned by the BCBS (2014), were classified as elements of ASF. For example, a 100% element of ASF was considered the (equity) capital plus the liabilities with a maturity of more than one year. Deposits with a maturity of less than one year were considered as 90-95% ASF elements, which mainly originated from retail but also from SMEs. Deposits with a maturity of less than one year, which mainly originated from financial companies or operational deposits, e.g., public organizations, or multinational banks, etc., were considered as 50% ASF elements. Finally, the deposits of other central banks or financial institutions with a maturity of less than 6 months or deposits without a clear maturity or also derivative differences —especially if this difference was negative (loss) for the bank— were considered as 0% elements of the ASF. Table I4, in Annex I, is very analytical in the categorization of the liability items with the corresponding percentages of the ASF.

On the other hand, the denominator of the ratio (Required Stable Funding-RSF) included all elements of the asset side which, in a banking system, were considered as less liquid during a financial crisis. According to the BCBS (2014) edition, there is also a rating concerning the assets elements. Table I5, in Annex I,

TABLE 3 Minimum level and implementation time of banks' liquidity covered ratio (LCR)

	1/1/2015	1/1/2016	1/1/2017	1/1/2018	1/1/2019
LCR	60%	70%	80%	90%	100%

Source: BCBS (2013).

is analytical in the categorization of the assets with the corresponding percentages of the RSF.

6. Conclusions

The establishment and evolution of the different BCBS editions by the BIS Committee was an important improvement of the regulatory conditions on which the stability and orderly operation of any developed banking system is based. The aim was, if not to avoid, at least to minimize the effects of any economic crises on it. In this article, the most important changes were highlighted, from 1988 to recently (2021), regarding the capital requirements, as well as the analytical delimitation of the weighted elements of the credit, operational and the market risk for the banks. In addition, the relatively more recent liquidity restrictions introduced by the BIS Commission (Basel III) were presented to address any liquidity risk that banks may need to face in an increasingly internationalized environment.

The answer to the question of whether these changes are sufficient for the stability of a banking system is not easy. In our opinion, the successful implementation of the rules of the BIS Committee is also linked to other factors such as the (political) power of the big banks, the different legal and political obstacles for the implementation of the directives, the level of development of the financial infrastructure of each country, the high quality of specialized staff and the existence of abundant data (see Jones & Zeitz, 2017), and finally the great advantage of the exclusive legal ability of banks to create credit *ex nihilo* (see Werner, 2014). Therefore, in a heterogeneous international banking system, the scale of the successful implementation of all these BIS Commission directives is rather limited for an effective long-term stability of the banking system.

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ANNEX I

TABLE I1 Bank's Risk Weighted Assets (RWA)

Risk Weighted Asset (RWA) 0%:	(a) Cash, (b) Claims from a central bank, (c) Other claims from OECD central governments and other central banks, (d) Claims secured by government cash or OECD government bonds.
Risk Weighted Asset (RWA) 0%, 10%, 20% or 50% (by national choice):	(a) Claims from public sector organizations other than the central government, and loans guaranteed by such organizations, (b) Claims from international development banks and other claims which have been guaranteed by shares of such banks, (c) Claims from international OECD banks and loans from OECD banks as well as loans guaranteed by OECD countries. Claims from banks outside the OECD list but with a final maturity of up to one year, (d) Claims from public sector organizations outside the OECD list and outside the central government, and loans guaranteed by such organizations, (e) Cash in process of collection.
Risk Weighted Asset (RWA) 50%:	Loans fully covered by real estate.
Risk Weighted Asset (RWA) 100%:	(a) Claims from the private sector, (b) Claims from non-OECD banks with a maturity of more than one year, (c) Claims from non-OECD central governments (unless denominated in domestic currency), (d) Claims from commercial companies that belong to the public sector, (e) Plant, tools, and other fixed assets, (f) Real estate and other investments (including holdings in other companies), (g) Holdings in other banks, (h) All other assets of the Balance-Sheet.

Source: BCBS (1988).

TABLE I2 Banks' off-Balance Sheet Risk Weighted Assets (RWA)

Risk Weighted Asset (RWA) 0%:	Loan commitments with an initial maturity of up to one year, which can be cancelled unconditionally at any time.
Risk Weighted Asset (RWA) 20%:	Short-term trade-related liquidity problems (guaranteed by the commodity itself).
Risk Weighted Asset (RWA) 50%:	(a) Specific transaction-related data (e.g., yield bonds, offering bonds, guarantees and fallback letters of credit related to specific transactions), (b) Facilities for issuing credit notes and other rolling underwriting facilities, (c) Other credit commitments (e.g., standard facilities and credit lines) with a maturity of more than one year,
Risk Weighted Asset (RWA) 100%:	(a) Direct credit substitutes, e.g., general debt guarantees (including letters of credit serving as financial guarantees for loans) and acceptances (including entries with characteristics of acceptance), (b) Sale and repurchase agreements on assets and sales of assets where credit risk remains with the bank, (c) Forward purchases of assets, forward-forward deposits and partially paid-up shares and securities representing commitments with a fixed drawdown.

Source: BCBS (1988).

TABLE I3 Exposure factors on the residual value of the financial products of the trading portfolio*

Residual value (*X*)	Interest rates (%)	Exchange rates (%)	Gold (%)	Commodities (%)	Equities (%)
$\chi \leq 1$ year	0	1.0	6.0	7.0	10.0
1 year $\leq \chi \leq 5$ years	0.5	5.0	8.0	7.0	12.0
$\chi \geq 5$ years	1.5	7.5	10.0	8.0	15.0

Source: BCBS (1998).

* The bank's exposure to these financial instruments typically involved derivative contracts on these instruments (e.g., Swaps, Futures, Options, etc.).

TABLE I4 Liabilities classification in relation to ASF (Main)

(%) ASF	Liabilities
100%	• Total share capital, and
	• Other capital items and liabilities with a maturity of more than 1 year.
95%	• Stable deposits with a residual maturity of less than one year, mainly from retail but also from SMEs.
90%	• Less stable deposits with a residual maturity of less than one year, mainly from retail but also from SMEs.
50%	• Financing with a residual maturity of less than one year provided by non-financial corporations.
	• Operating deposits.
	• Financing with a residual maturity between six months and one year, e.g., by central banks, etc.
0%	• Other balance sheet liabilities, e.g., without clear maturity.
	• Derivatives differences – especially if this difference is negative for the bank.

Source: BCBS (2014).

TABLE I5 Assets classification in relation to RSF (main)

(%) ASF	Assets
0%	• Coins and banknotes.
	• Central bank reserves (e.g., required reserves as well as excess reserves).
	• Unencumbered loans to banks with a residual maturity of less than six months.
5%	• Negotiable securities representing states, central banks, or other well-known institutions (e.g., ECB, IMF, BIS, etc.) that have zero credit risk under Basel II.
	• Government debt or non-zero risk-weighted central bank debt.
15%	• Negotiable securities representing states, central banks, or other well-known institutions (e.g., ECB, IMF, BIS, etc.) that have 20% Basel II credit risk.
	• Corporate debt or covered bonds which are rated at an AA- level of credit risk.
50%	• Real estate securities (RMBS) with a rated credit risk of at least an AA level.
	• Corporate debt with rated credit risk between A+ and BBB-.
	• All loans to banks with a residual maturity between six months and one year.
	• Deposits, for operational purposes, with other financial institutions.
	• Other assets not included in the above categories and have a residual maturity of less than one year.
65%	• Unencumbered real estate loans with a residual maturity of more than one year with less than 35% credit risk under Basel II.
	• Other unencumbered loans not falling into any of the above categories, excluding loans to financial institutions with a residual maturity of more than one year with a credit risk of less than 35% under Basel II.
85%	• Other unencumbered loans with a residual maturity of more than one year and no less than 35% credit risk under Basel II,
	• Other unencumbered securities that are not in default and do not belong to highly liquid assets (HQLA).
	• Gold and other traded commodities.
100%	• All encumbered assets with a maturity of more than one year.
	• Derivatives differences, especially if this difference is negative (loss) for the bank,.
	• All assets not reported in the above categories.

Source: BCBS (2014).

ANNEX II

The calculation of the residual value, based on the data of Table I3-Annex I, plus the *replacement costs* from the "closing" of the financial product contracts added up to a total amount that constituted the capital charge of the bank for a range of financial products (*market risk*). In algebraic form, this risk, as an amount, E^{MR}, was calculated using the following equation:

$$E^{MR} = RC + \text{“add on”} \quad (1)$$

with

$$\text{“add on”} = X(\%) \times P^{N} \quad (1a)$$

where: E^{MR} is the bank's total exposure, as an amount, from the contracts of these financial products; RC is the cost of "closing" the financial position or *the cost* of replacing the financial contracts by the bank (it could also be a profit); X is the risk of variation in the residual value of the financial product up to its maturity, calculated as a percentage (%) in Table I3; P^{N} is the nominal price (value) of the financial contract, which is the future exposure of the bank to these financial contracts.

ANNEX III

The original mathematical system of equations for calculating credit risk in the IPB method had the following form:

$$\textit{Correlation}\ (R) = 0.12 \times \frac{1-e^{-50\times PD}}{1-e^{-50}} + 0.24 \times \left(1 - \frac{1-e^{-50\times PD}}{1-e^{-50}}\right) \quad (A1)$$

$$\textit{Maturity adjustment}^{1}\ (b) = \left(P_a - P_b \times Ln(PD)^2\right) \quad (A2)$$

$$\textit{Capital requirements}\ (K)^{2}\ \textit{(as \%)} = \left(LGD \times N\left(\frac{G(PD)}{(1-R)^{0.5}} + \left(\frac{R}{(1-R)}\right)^{0.5} \times G(0.999)\right) - PD \times LGD\right) \times \frac{1+(M-2.5)\times b}{1-1.5\times b} \quad (A3)$$

$$\textit{Risk-weighted elements}\ (\textit{RWA: as an amount}) = K \times 12.5 \times EAD \quad (A4)$$

$$\textit{Capital charge}^{3} = 8\% \times \left(\textit{RWA (as an amount)}\right) \quad (A5)$$

Where: $N_{(x)}$ refers to the cumulative distribution function of a standardized normal random variable. In other words, the probability of a normal random variable, with mean 0 and variance 1, to be less or equal to x, and

$G_{(z)}$ refers to the inverse cumulative distribution function of a standard normal random variable, i.e., the value of x so that $N_{(x)} = z$.

1. In the parameters (P_a & P_b) of this equation numerical values are usually given after some simulations.

2. If the "capital requirements (K)" go negative, e.g., in the case of a reliable bond, then zero is chosen.

3. The capital charge in the *Standardized* approach can be considered as a limited *IRB*. In particular, the *Standardized* approach does not include any *PD* (or as if *PD* = 100% or 1). So, in this approach, we speak for expected losses (EL) held in Tier's. Algebraically speaking, we keep only equations (A4) and (A5), since with *PD* = 1 or 100%. This happens because equation (A1) is $R = 0.12$, equation (A2) is $b = P_a^2$ (constant) while equation (A3) $\cong 0$ (is of no use).

ANNEX IV

There are five (5) risk-weighted risk (*RWA*) categories that Basel II provided for calculating the unexpected losses (ULs) from banks' assets (future claims).

TABLE IV.1 *Risk Weighted Assets (RWA)* to calculate unexpected losses (UL) on corporate, banking and sovereign risk

Category	Strong	Good	Satisfactory	Weak	Default
External evaluation	BBB- or better	BB+ to BB	BB- to B+	B to C-	NA
Risk Weighted Asset- (%)	70%	90%	115%	250%	0%

Source: BCBS (2006).

TABLE IV.2 Long-term calculation of securitisation bonds

External evaluation	AAA or AA-	BB+ to BB	BB- to B+	B to C-	B+ and smaller, or Unclassified
Risk Weighted Asset- (RWA)	20%	50%	100%	350%	Subtraction from Tiers

Source: BCBS (2006).

TABLE IV.3 Short-term calculation of securitisation bonds

External evaluation	A-1/P-1	A-2/P-2	A-3/P-3	Not available
Risk Weighted Asset - (RWA)	20%	50%	350%	Subtraction from Tiers

Source: BCBS (2006).

ANNEX V

The main changes in the BCBS (2017) edition categories [Basel III] compared to the corresponding BCBS (2006) edition categories [Basel II] were:

- International Development banks

A new separate category in the BCBS (2017) edition with the following ratings: AAA to AA- (20%), A+ to A- (30%), BBB+ to BBB- (50%), BB+ to B- (100%), below B- (150%) and finally ungraded (50%).

- Exposure to (other) banks

An existing category of the BCBS (2006) edition, which was now differentiated into "basic" and "short-term". Both categories now were at roughly the same weighting levels of the BCBS (2006) edition. The only substantial weighting factor change was in the rating, between A+ to A-, of the "basic" category (from 50% to 20% in 2017). There was also no longer an unrated weighting in either category.

- Exposure to shares of companies and other financial institutions

A category which, according to the BCBS (2017) edition, resembled exposure to banks if supervisors followed strict supervisory procedures as in the case of banks.

- Exposure to companies

A new category which included, according to the BCBS (2017) edition, insurance and other financial corporations that did not meet the classic definition of a bank. There were two weighting factor changes compared to the corresponding category of the BCBS (2006) edition: The rating from BBB+ to BBB- increased to 100% (from 75%), and we had an added-up category (BB+ to BB-, with 100% weighting factor) that did not exist in the BCBS (2006) edition.

- Exposure to retail banking

According to the BCBS (2017) edition, this category incorporated three (3) main sub-categories: the "simple" retail with a weighting factor of 75%, the "simple" retail associated with timely repayments (e.g., credit cards) with a weighting factor of 45%, and, finally, the "others" that did not meet certain criteria with a weighting factor of 100%. In the BCBS (2006), edition we had only one category with 75%.

- Exposure guaranteed with real estate

In the case of the BCBS (2017) edition, a ratio was created as the value of the loan to the value of the asset operating as collateral (LTV - Loan to Property ratio). The higher this ratio was, the higher the weighting factor assigned to the bank's report. In addition, and in contrast to the BCBS (2006) edition, in the two (2) real estate sub-categories —the residential and the commercial— a series of respective weighting factors were assigned. In the case of the BCBS (2006) edition, we had only a percentage for each sub-category that was not physically correlated with the LTV ratio.

- Exposure to off-Balance Sheet items

In this case, according to the BCBS (2017) edition, some new categories were created, and a different weighting factor was assigned.

ANNEX VI

The core, supplementary, and additional supplementary funds (Tier I, II & III) on a more detailed basis were as follows:

The core Capital (Tier I)

As recorded in the BCBS (1988), Tier I funds were sub-divided into *paid-in share capital* and *reserves*. In the BCBS (1998) edition, in the context of Basel I, in the *paid-in share capital,* both the *ordinary* and the *preference shares* were included as well as the *Reserves*. Several other elements of the accounting system are enclosed within these *Reserves* (see Table VI.1).

More specifically, retained *gains or losses* appeared, which constitute the accumulated annual profit and loss of the bank that are transferred to its own funds. However, other forms of capital (*surplus*) are also presented as, for example, some new capital created either by a listing of the bank's shares on the stock exchange (IPO–*initial public offering*), or by another form of share *premium account* (of the nominal value), or from *general retained reserves* (e.g., tax-free reserves for investment purposes or reserves formed by the bank's statutory obligations such as the statutory reserve, etc.). In the case of a bank's consolidat-

TABLE VI.1 Analytical presentation of Tier I (1988, 1998)

- *Paid-up share capital/ordinary shares at par value.*
- *Preferred shares.*
- *Reserves*
  1. *Retained gains or losses,*
  2. *Other forms of new subscribed capital (surplus), e.g.,*

     I.P.O.s (initial public offering),

     Other forms of share premium account (nominal price),

     General and/or statutory retained reserves (e.g., tax-free reserves).
- *Minority interests* (participations of other interest group(s) in the share capital of *the bank's subsidiaries)*

Source: BCBS (1998).

ed accounts, Tier I also includes *minority interests* that constitute the participation of other interest group(s) in the share capital of the bank's subsidiaries.

Supplementary funds (Tier II)

The supplementary funds are those which, according to Basel I (1988 & 1998), could support "losses" without creating serious liquidity problems for the bank. In other words, their aim was to help the bank to "finance" its assets in a less suffocating way than that of Tier I.

At the beginning of the whole process, the BIS Committee allowed only Tier I elements to finance and control the activities of banks. This permitted only a few banks to be able to cope with such a "credit corset". So, thanks to Tier II funds, which were a mixture of "other" equity elements and some bank liabilities (with characteristics, in terms of maturity & repayment, analogous to equity), a looser credit control on banking activities was granted.

Regarding the individual components of Tier II (see Table VI.2), starting with *undisclosed reserves*, we could say that these funds are considered eligible after approval by the supervisory authorities. Theoretically, this determination corresponds to a portion of the after-tax profit or loss accounting results. Indeed, banks' supervisors expect such a "buffer" to assist banks to deal with contingencies losses.

The *revaluations of assets* are also included. Regarding banks' fixed assets, in some countries there is the option of revaluing them and presenting any existing difference in their equity. In addition, the option of exhibiting the results from revaluations of banks' portfolios and the re-estimation of shares which appear in their historical acquisition costs in the Balance Sheet is also granted. Basel I offered the possibility of a discount of 55%, in terms of the difference between historical cost and current market price of e.g., a share in the trade portfolio, not only in order to protect the bank from strong market fluctuations in the share prices (volatility), but also for reasons of tax charging on unrealized gain in the equity.

There were also the *General reserves to cover unexpected defaults by counterparties*. This case refers to the need for capital to cover the bank against possible defaults on loans by counterparties that had not yet been specified. In addition, Basel I made it clear that the bank should not cover already recorded losses with these *reserves*. Finally, the amount of general reserves should not exceed 1.25% of the bank's total risk weighted asset requirements.

Hybrid capital tools also appear. With this term, Basel I referred to a series of supervisory "policy tools" that encompass both equity and debt characteristics. These "policy tools" can be preferred shares, convertible bonds, and perpetual loans. The exact concept of *hybrid capital tools* varied from country to country but, as stated in Basel I (BCBS, 1988 & 1998), there were certain conditions that had to be generally convened by these funds to be included in Tier II.

The *Unsecured Debt*, as a debt instrument, although part of the bank's liabilities, is also included in Tier II. This additional type of capital must have a lifespan of

TABLE VI.2 Analytical presentation of Tier II (1988, 1998)

- *Undisclosed reserves mainly to cover extraordinary losses.*
- *Revaluations of assets*
  1. *Revaluations on fixed assets.*
  2. *Revaluations of portfolios (e.g., at a discount).*
- *General reserves to cover unexpected defaults by counterparties.*
- *Hybrid capital tools* (e.g., mandatory convertible debts but also some classes of special terms preference shares that are not related to Tier I preference shares).
- *Unsecured debt* of limited duration but more than 5 years (e.g., *redeemable preference shares of special terms not related to Tier I preferred shares*).

Source: BCBS (1998).

more than five years. It also contained the time-limited redeemable preference shares (which are not related to those of Tier I). These shares were offered at a discount of 20% per annum by banks, which also indicated their limited value as a capital tool. Finally, it should be noted that these funds differed from *hybrid capital tools* because they did not participate in the bank's losses.

Some further supplementary funds (Tier III)

These additional funds (Tier III) displayed by the BCBS (1996) edition were a short-term subordinated debt that operates in the bank's equity in cases related to market risk. The aim was to become part of the bank's permanent capital so that it could absorb losses in the event of bankruptcy (insolvency). However, to be able to have this status, these funds should, as a minimum:

- be non-guaranteed, subordinated and fully paid-up,
- have an initial duration of at least two years,
- be not repayable before the agreed repayment date, unless agreed by the supervisory authority,
- be subject to a lock-in clause stipulating that neither interest nor principal could be paid (even at maturity) if such payment would lead the bank to fall below or generally be below its minimum capital requirement.

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