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The quest for economic development and growth through the aggregate supply

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Abstract

When an increase in the aggregate supply dominates changes occurring in the aggregate demand, then output increases and the price level decreases. This desirable outcome in the operation of the economy and in policy intervention appears to have occurred frequently in Greece during 2001-10, but less frequently afterwards (in 2011-21). The article describes this development, as well as the evolution of employment during 2001-22, and the evolution of consumer prices across products during the pandemic and the recent international supply-chain, food, and energy crises (in 2020-22). It also compares the turnover of domestic enterprises across sectors to the turnover observed prior to the pandemic and the other crises, providing potentially useful observations. With the country experiencing inflationary pressures and moving through successive crises (not to mention possible climate change crises), it is sensible to strengthen domestic production (i.e., expand the aggregate supply). Even if the expansion of the aggregate supply does not always dominate changes in the aggregate demand, it will mitigate inflationary pressures and hinder GDP reductions or advance GDP growth. The common good is served when decision makers and the society at large mull over, talk about, refine and accordingly implement new and old ideas or practices employed elsewhere in the direction of expanding the aggregate supply.

Keywords: *Aggregate supply and aggregate demand, GDP, Inflation, Pandemic and other global crises, Economic development planning.*

JEL classification: *E10, E31, I15, J21, M20*

1. Introduction

When viewed in a typical output-price setting, a country's economic situation and operation are typically described in terms of its aggregate demand and the aggregate supply. The aggregate demand (AD) captures the impact of domestic consumption, investments, government spending, the money supply, net exports and other economic flows with the rest of the world. On the other hand, the aggregate supply (AS) captures the impact of labor, other inputs, entrepreneurship, and the technologies that individual producers employ in the production of goods and services. (E.g., Siegel, 1960; Abel and Bernanke, 2001.)

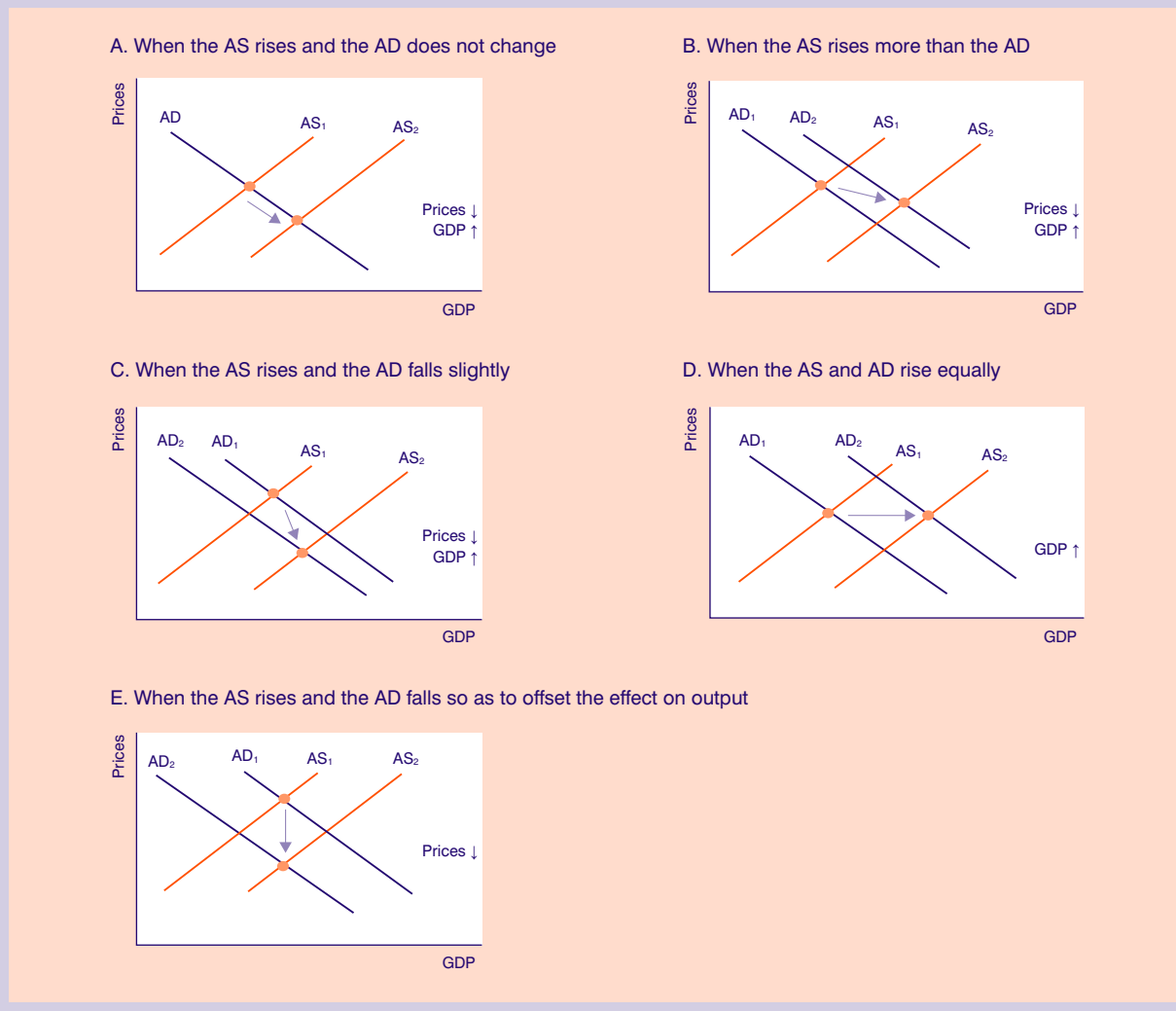
Depending on whether changes in the aggregate demand prevail over changes in the aggregate supply or vice versa, the quantity of output produced can move in the same or opposite direction as the price level. Specifically, when the aggregate supply increases more than the aggregate demand increases or decreases, then, *ceteris paribus*, output increases and the price level decreases, whereas when both shift equally, then either the output or the price level stays the same. (See Figure 1 and Figure 2.A.) By contrast, when an increase in (i.e., a rightward shift of) the aggregate demand dominates the right- or left-ward shift (i.e., a rise or fall) of the aggregate supply, then both output and the price level increase. When a decrease of the aggregate supply dominates the shift of the aggregate demand, then output decreases and the price level increases. When a decrease of the aggregate demand dominates the shift of the aggregate supply, then both

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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.

FIGURE 1

Select cases of aggregate supply (AS) increases and aggregate demand (AD) shifts and their impact on GDP and prices



output and the price level decrease.¹ (See Dornbusch and Fischer, 1994; and Figures 2.B-D.)

It turns out that a rise in the aggregate supply that dominates a shift of the aggregate demand is preferable to the other three developments as it causes output to rise,² prices to fall, and, hence, living standards to improve. In addition, lower prices make the country's goods and services more competitive. As we shall see, such simultaneous price falls and output rises in Greece used to occur frequently in the past, but are less frequent lately.

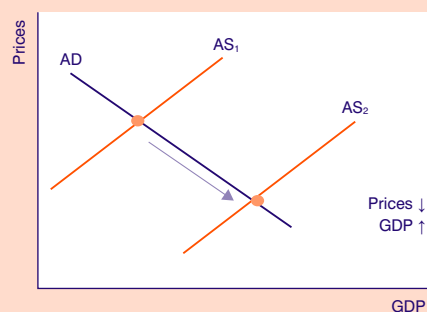
The article does not take part in the debate of competing schools of macroeconomic thought that promote the importance of either the aggregate supply side or the aggregate demand side in driving economic growth. (For instance, see Baumol and Blinder, 1986; Lucas, 1990.) Characteristically, it makes no reference to *government project multipliers* or *tax cuts*. It accepts that interventions both from the side of the aggregate supply and from the side of the aggregate demand may affect economic growth; and that interventions from either side may be combined

1. The working hypothesis is that the economy is far from the maximum level of output that can be produced in full employment: a reasonable assumption in view of Figure 3.

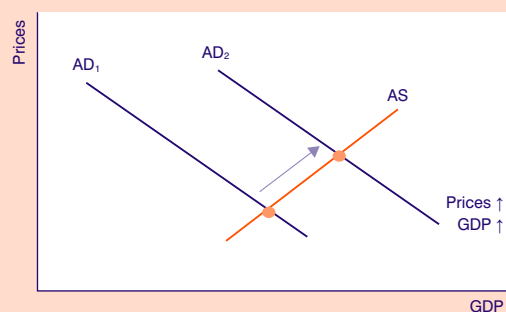
2. The widely used measure of output is the gross domestic product (GDP). Though far from being an ideal measure, it is the best measure we have at regular intervals.

FIGURE 2
The impact of a dominant aggregate supply (AS) or aggregate demand (AD) shift on GDP and prices

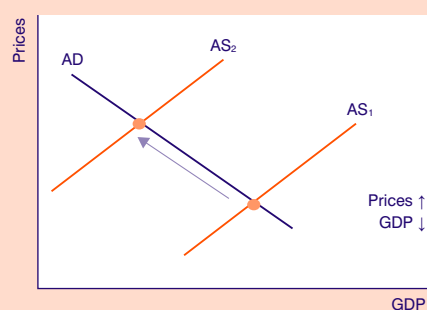
A. When a rise in the AS dominates changes in the AD



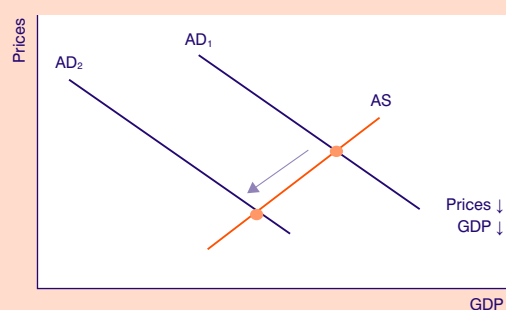
B. When a rise in the AD dominates changes in the AS



C. When a fall in the AS dominates changes in the AD



D. When a fall in the AD dominates changes in the AS



or feed into the other side. For instance, demand side policies in the form of investments may affect the improvement of production inputs and, over time, affect growth from the supply side.³

The rest of the article is organized as follows: Chapter 2 provides an overview of recent economic developments in Greece in terms of overall output and prices (developments running from 2001 to 2021). Chapter 3 discusses the prospect of high inflation rates and ways to contain it. Chapter 4 discusses the evolution of domestic prices across various groups of products during the novel coronavirus pandemic via data running up to the second quarter of 2022. Chapter 5 does the same with the evolution of employment and of turnover, and Chapter 6 concludes.

2. Overview of economic developments in Greece in terms of output and prices during 2001-21

In the years that followed Greece's accession to the euro (2001), the country's output continuously increased until 2009-10, at which time output reached the highest level in the country's history (Costelenos et al., 2007; Chalikias 2013). Subsequently, triggered by the turmoil of the global financial crisis and, in particular, due to the sovereign debt crisis (i.e., the inability of the Greek government to borrow at low interest rates in order to repay the public debt), and in the course of the bailout (i.e., the economic adjustment) programs, output shrank. It recovered in 2017-19, decreased once again in the first year of the pandemic (2020),⁴

3. It is a sequence of actions that to some extent reverses the order of things in the expression by which J.B. Say's law is often summarized, namely, that *the supply creates its own demand* (see Baumol, 1999).

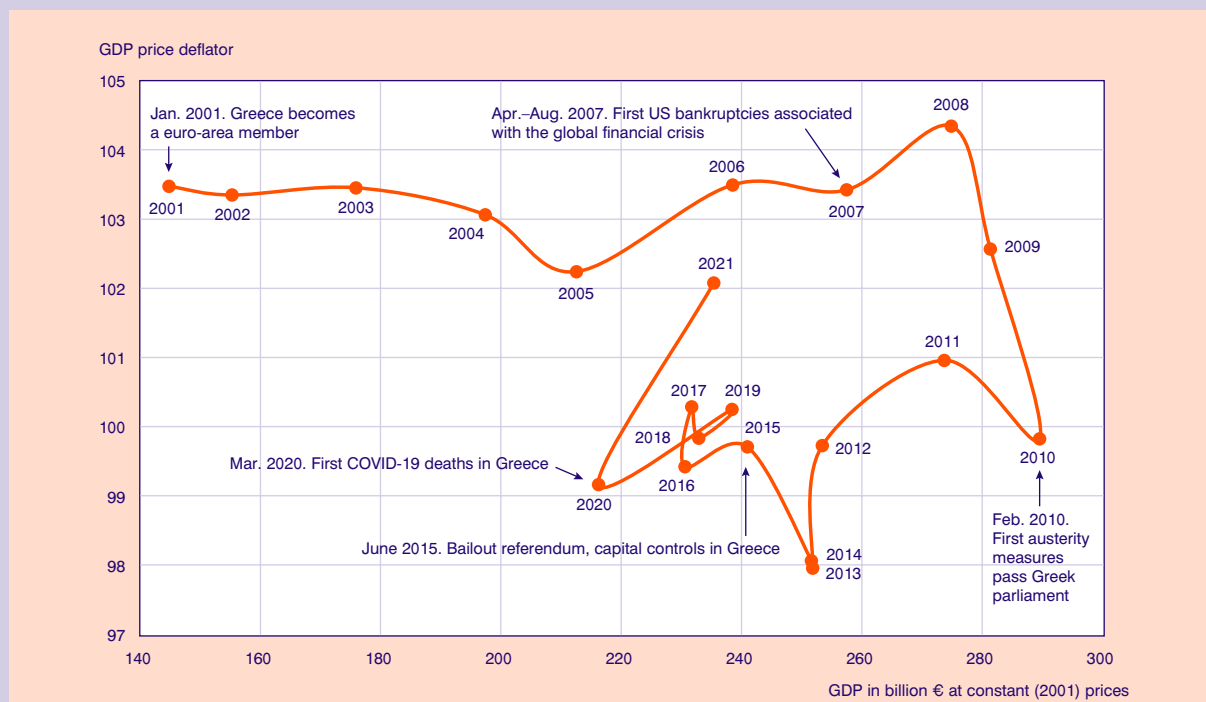
4. At the same time, a global supply-chain crisis occurred, and the global food situation worsened. E.g. Esper (2021), Raj et al. (2022), and the WFP (2022) of the UN.

and rebounded in the second year of the pandemic (2021), prior to the war in Ukraine, the international sanctions and countersanctions, and the energy crisis (2022).⁵ See Figure 3⁶.

The evolution of both output and prices suggests that:

- The first phase (2002-10) consisted of years in which increases in the aggregate supply dominated changes in the aggregate demand (in 2002, 2004-05, 2007, 2009-10), and years in which increases in the aggregate demand dominated changes in the aggregate supply (in 2003, 2006, 2008).
- The second phase (2011-16) consisted of years in which decreases in the aggregate demand dominated changes in the aggregate supply (in 2012-13, 2016), and years in which decreases in the aggregate supply dominated changes in the aggregate demand (in 2011, 2014-15). In 2014,
- the downturn was halted. However, the year that followed was packed with two electoral contests, a referendum, and capital controls, and the downturn deepened.
- The third phase (2017-19) consisted of years in which increases in the aggregate demand dominated changes in the aggregate supply (in 2017, 2019) and a year in which an increase in the aggregate supply dominated changes in the aggregate demand (2018).
- The fourth phase, that of the pandemic (2020-21), consisted of a year in which a decrease in the aggregate demand dominated changes in the aggregate supply (2020), followed by a year in which an increase in the aggregate demand dominated changes in the aggregate supply (2021). The pandemic continues through 2022. See Figure 4.

FIGURE 3
The evolution of output and prices in Greece from 2001 to 2021



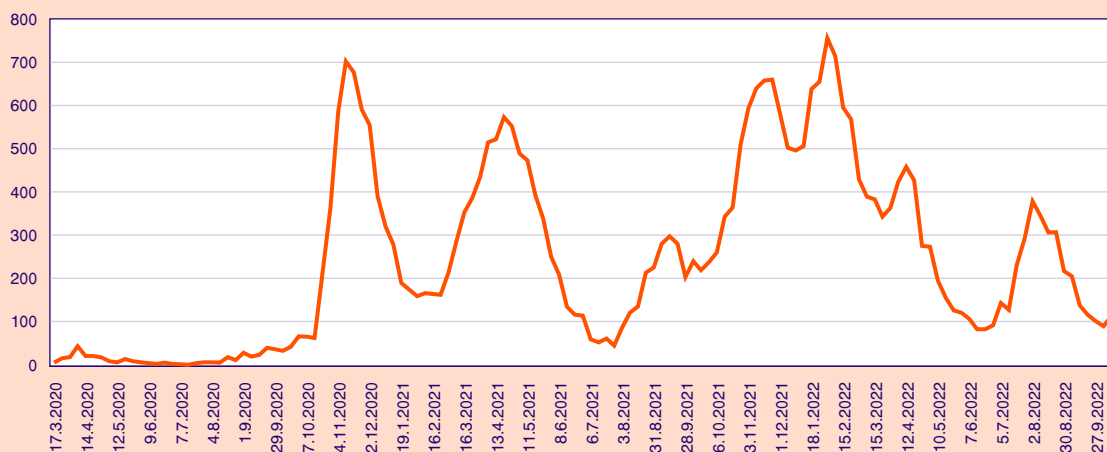
Source: Hellenic Statistical Authority (ELSTAT), own calculations.
A break occurs in the time series in 2010 (i.e., from 2010 onwards).

5. E.g., European Union (2022).

6. During the same period: employment dropped (in 2009) prior to the decrease in the real GDP (2010-11), rose intermittently (in 2014 and 2016), recovered in 2018, after the real GDP rose (in 2017), and fell again in the first year of the pandemic (2020) as did the real GDP.

FIGURE 4

The evolution of the pandemic in Greece in terms of weekly deaths, March 11, 2020 - October 11, 2022 (11.3.2020-11.10.2022)



Source: Johns Hopkins University, own calculations.

3. The prospects of high inflation and of reigning it in

Obviously, the upward shift in the aggregate demand during 2021, to some or to a considerable extent, included government spending to:

- help firms, households, vulnerable populations, and the society at large deal with the negative effects of the interventions taken to prevent the spread of the pandemic in the society, and
- affect economic and social recovery, and make the economy and society more sustainable, resilient and better prepared for future challenges and opportunities.

Yet, while reasonable and desirable, this government spending caused or contributed to a price increase – a rather small overall annual price increase in terms of the GDP deflator (one of the lowest in the EU-27) according to Eurostat.⁷

Currently (in 2022), new –and, perhaps, more intense– government spending for the same reasons, and in order to deal with the consequences of the war in Ukraine (especially the energy crisis), in all likelihood will bring about additional price increases. It is a foreseeable

side effect of the treatment employed, especially if the aggregate supply does not expand at the same or a higher pace. (See Box 1.)

This means that if in 2022 and in 2023 (a) the Greek government moves more actively than in the past and more actively than governments in other countries and/ or (b) the structure of the Greek economy allows for a smaller expansion of the aggregate supply compared to other countries, then, in all likelihood (c) the overall price increase in Greece will exceed the respective price increases in the said countries. In other words, if either (a) occurs or (b) is true, the government’s reasonable, generally acceptable moves are likely to result in (c).⁸ To stress the point: This does not in any way imply that it is not appropriate for the government to resort to higher spending, but rather that a large price increase is likely to occur as a result.

If the inflation rate exceeds 2% across the Eurozone, then, in all likelihood, the European Central Bank (ECB) will intervene to curb the rate by shortening the rightward move of the aggregate demand. This will surely restrict the prospect of GDP growth.

In view of the above, it is necessary to expand the domestic production of goods and services (i.e., the ag-

7. <https://ec.europa.eu/eurostat/databrowser/view/teina110/default/table?lang=en>.

8. It seems that in the first half of 2022, the country exhibited the 8th highest price increase among the EU-27 member states in terms of the GDP deflator. See also footnote 7.

BOX 1

A note on aggregate supply-side interventions

Spending or legislating to:

- improve infrastructure, human capital, labor productivity, the flow of inputs/outputs along the supply-chain (also value-chain), and the dissemination of information across society as well as in the public and private sectors,
- raise the attractiveness of engaging in paid work activities,
- promote entrepreneurship,^a research and development, and a business friendly environment and ecosystem,
- deregulate or reduce red tape and state interventions in favor of market competition,^b and the creation of businesses,
- affect the organizational, managerial, production and marketing improvement of businesses and public bodies

may raise the aggregate demand contemporaneously, and (if successful) will raise the aggregate supply at a future date.

The Greek government's recovery and resilience plan has both a six-year legislation and spending horizon, and a long-term supply-side realization prospect (Hellenic Republic, 2021).

a. In the sense of the individual's ability to bring resources together in a new and efficient way, and organize things both differently and successfully.

b. Barring a small number of exceptions: e.g., cases of natural monopolies, the Government's or the EU Commission's centralized procurements.

aggregate supply) as much as possible to both temper inflation and raise the GDP. Even if it may not be easy to effectively and swiftly restructure most sectors of economic activity and the economy at large, it may be possible in some cases: conceivably in the production of a good or service with spare capacity, or by affecting one or two of the changes mentioned next to the bullets of Box 1, in a specific sector or region of the country with as little demand-side involvement as possible.⁹

Indeed, it may be appropriate to put into action new ideas, as well as ideas considered in the past with the same rationale: To preserve people's purchasing power

by, say, removing distortions of competition¹⁰ or by once again adding sales periods to the original two (summer and winter sales). Case in point, the introduction in 2013 of two brief sales periods (in spring and autumn) brought about price reductions that did not exist before (e.g., in 2012) and visibly differentiated the Greek Consumer Price Index (CPI) patterns from the respective EU patterns (see Figure 5).¹¹

In addition, in order to keep inflation low and raise real GDP, it may be appropriate to engage in coordinated purchases with other EU member states of, say, natural (fossil) gas and other fuels.¹²

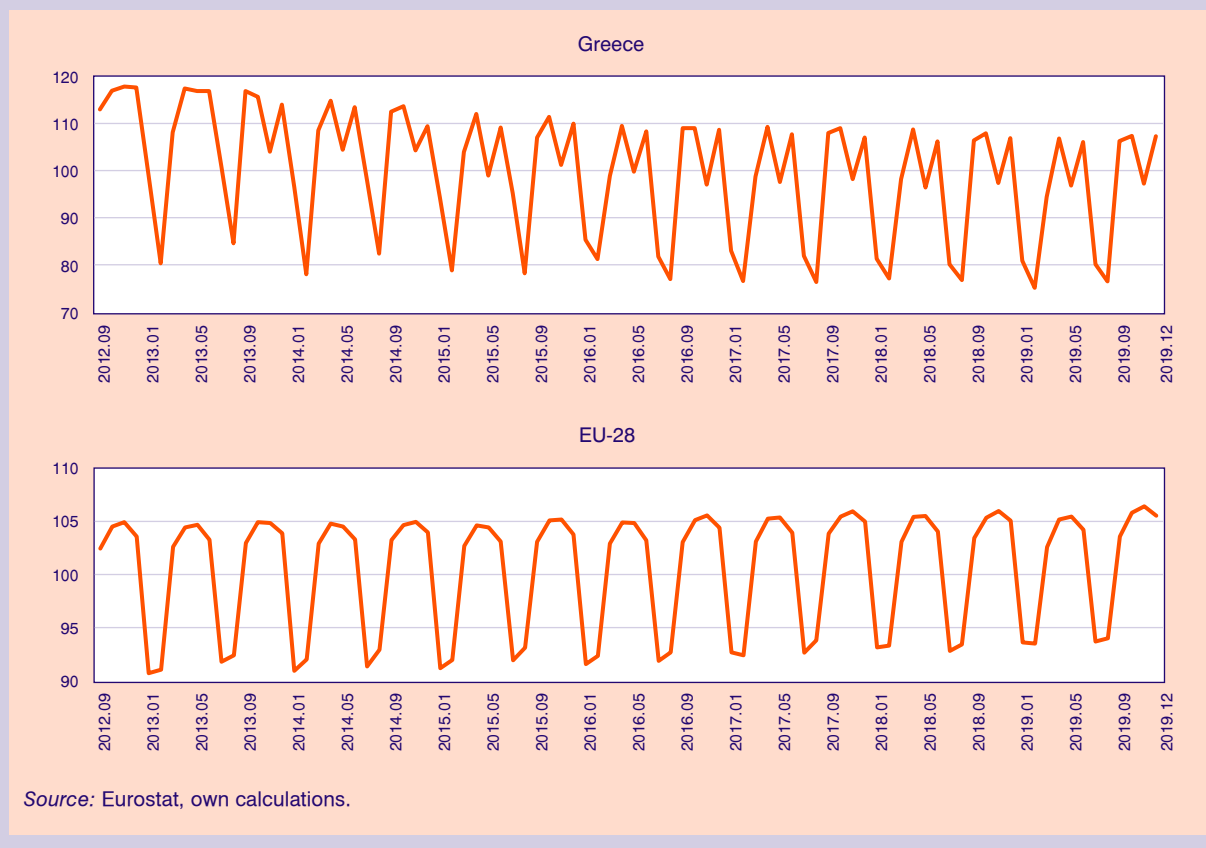
9. A number of projects that affect a rise in the aggregate supply may also affect a rise in the aggregate demand and, thus, produce an ambiguous price effect. For instance: (a) The extension of the tourist season (through the use of existing and new resources) may facilitate the provision of hosting services in Greece during winter (a mild winter by central and northern European standards) to people from colder climates through the energy crisis. (For more on the special tourism campaign associated with the attempt see Connolly, 2022). (b) Allowing the voluntary Sunday opening of small shops (bookshops, clothing shops, fruit shops, etc.), as already done with florists, restaurants, petrol stations and pastry shops (see Appendix 1).

10. For instance, the partial removal of fixed prices in the books industry during 2014-18 in Greece affected a price reduction and an expansion of the consumer's surplus (Kontolaimou et al., 2019; Prodromidis, 2020).

11. Professional and other social groups resented such interventions in the past and may resent them in the future. The State may choose to employ (or not employ) policies that raise overall welfare, and to compensate those hurt by the intervention.

12. As a purchasing party, the Greek government has pursued centralized procurement approaches to lower prices in the past. Currently, following the paradigm of the recent centralized COVID-19 vaccine procurement by the EU, the Greek government actively participates in the formulation of an EU-wide plan on the procurement of natural gas (see Liagou, 2022).

FIGURE 5
The monthly harmonized consumer price index in Greece and the EU-28 during 2012-19:
clothing & footwear (2015= 100)



4. Recent developments in domestic prices by product groups

Turning our attention to the recent evolution of natural gas prices and the prices of other goods and services sought by consumers (Figure 6):

- The prices of food and non-alcoholic beverages increased the most during the first year of the pandemic and a considerable portion of the second
- year of the pandemic, vis-à-vis the corresponding months of 2019:¹³ in particular, from May 2020 to the end of the year, and (again) from May 2021 onwards.¹⁴
- Housing prices¹⁵ exhibited an even higher increase from October 2021 to August 2022 (last month for which data exist at the time of writing the article).
- Transportation prices¹⁶ rose in October 2021 (see also footnote 15, it is no coincidence)¹⁷ and, again,

13. The comparison is carried out with respect to the same months of 2019 so as to isolate seasonal effects.

14. In both May 2020 and May 2021, travel restrictions and lockdowns eased. In Greece, the main tourist season commences at the end of spring.

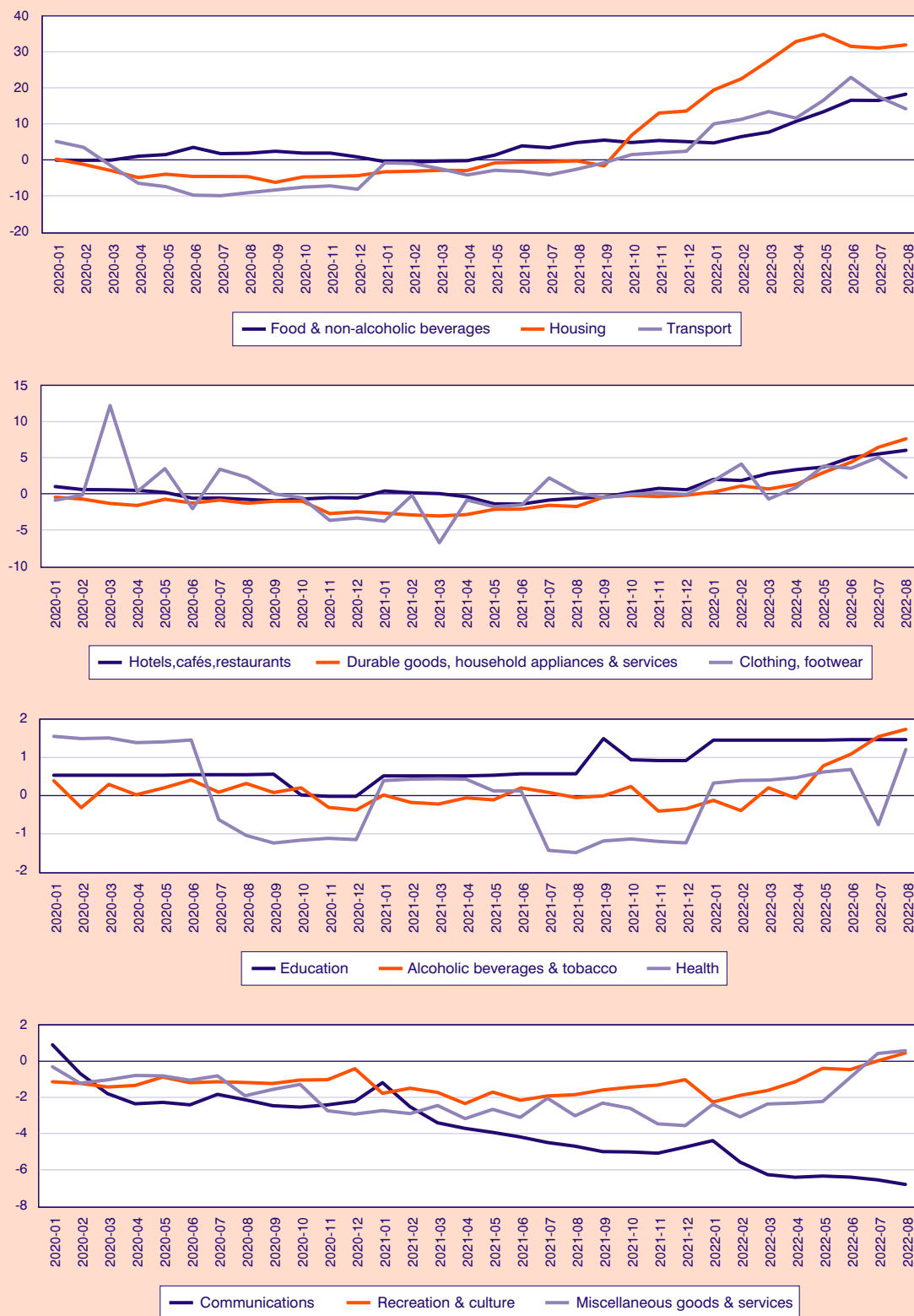
15. Housing prices depend on rents and expenses for electricity, gas, other fuels, water supply, etc., as well as for home repairs and maintenance. During the four-month period that preceded the war in Ukraine, housing price increases were attributed by ELSTAT to electricity, natural gas and heating oil bills.

16. Transportation prices depend on expenses for vehicles (purchases, repairs, maintenance, fuel, parking, tolls, road tax), the transportation of people and goods, and driving lessons. During the four-month period that preceded the war in Ukraine, transportation price increases were attributed by ELSTAT to expenses for new cars, fuel, lubricants and (to some extent) airline passenger tickets.

17. Crude oil prices increased in October 2021 as (a) increasing COVID-19 vaccination rates, loosening pandemic-related restrictions, and a growing economy resulted in global petroleum demand rising faster than petroleum supply and (b) global petroleum production increased slower than demand as per a specific policy of the Organization of Petroleum Exporting Countries.

FIGURE 6

The evolution of consumer price sub-indices during Jan. 2020 – Aug. 2022 (2020.01 – 2022.08), compared to the same months of 2019



Source: ELSTAT, own calculations.

from January 2022 onwards, surpassing the price increases for food and non-alcoholic beverages.

At the same time, the prices of other goods and services¹⁸ either moved upwards at a slower pace or (in the case of communication services)¹⁹ moved downwards. Overall, the developments –especially the energy crisis triggered by the war in Ukraine and by the EU sanctions to Russia and Russian countersanctions– caused the monthly CPI²⁰ in Greece to increase progressively by 5 to 11% in the first six months of 2022, compared to the corresponding pre-pandemic months of 2019.

5. The recent evolution of variables linked to production and to the aggregate supply

As the economy operated under (a) constraints either intended to prevent the spread of the pandemic in the society or associated with the disruption of the global supply chain (initially due to the pandemic, then due to sanctions and counter-sanctions in the wake of the war in Ukraine), and the slow return to some kind of normality (a return hindered by the pandemic's persistence), as well as (b) considerable stimulus interventions from the aggregate demand side,²¹ it seems that in the course of the first two quarters of 2022:

- Employment rose by 6 and 5% compared to the first and second quarters of 2019, respectively, and the unemployment rate fell (continued to fall) by 18 and 24%, respectively. (See Figure 7.)
- Employment rose in twelve of the 21 sectors of economic activity during both the first and the second quarters, fell in two sectors in both quarters, and rose in one quarter, but fell in the other quarter in seven sectors. (See Table 1. The classification and short descriptions of the various economic activities is supplied in Table 2.)
- The turnover of businesses and other corporations (i.e., the product of the price multiplied by the quantity sold) rose more than (a) the CPI in most industries of economic activity, and (b) the Producer Price Index (PPI) changed (increased or decreased) in twelve industries (namely, industries 01, 19, 21, 24, 27, 38, 51, 61, 62, 70, 78, 80).²² This suggests an expansion of output and demonstrates an element of dynamism.²³ (See Table 3.)

In addition, it appears that at least: (a) 16 industries achieved slightly higher turnover compared to the same period in 2019 (by 1-10% in one quarter, 3-45% in the other quarter); (b) eleven industries achieved higher turnover compared to the same period in 2019 (by 12-19% in one quarter, 13-32% in the other quarter);

18. Including (a) household equipment, furnishings, garden tools and equipment, and routine household maintenance; (b) leisure and cultural goods such as audiovisual equipment, computers (and their repairs), caravans, boats, horses, electronic and board and children's games, musical instruments and indoor recreation equipment, outdoor and sporting goods, garden products, flowers, pets, sports; leisure activities such as cinema, theater, concerts, museums, libraries, zoos, etc., newspapers, books, stationery, holiday packages, other cultural activities, TV license and subscriptions, DVD rentals, photo services, gambling; (c) other goods and services such as personal care items, jewelry, watches, hairdressing and other personal care services, childcare, care for the elderly and disabled, home care services, counselling, insurance premiums, financial and other services (for passports, ceremonies, lawyers, photocopies, real estate agencies, etc.).

19. They depend on expenses for postal and telephone services, as well as for telephone and facsimile equipment.

20. In contrast to the GDP deflator, a measure of overall price changes in the economy that takes into account that consumption and investment patterns may vary from one year to the next, the CPI is based on a fixed basket of goods and services and reflects movements in the prices of consumer goods and services only. Both figures are used as measures to calculate inflation. To the extent that the CPI does not take into account spending for military equipment and other government procurements, as well as spending from businesses or foreigners, it better approximates changes in the cost of living for residents. Indeed, the harmonized CPI across the EU constitutes the inflation measure that the ECB considers in order to intervene and maintain price stability. See also Oner (2017). From a statistical point of view, we are not yet able to engage in comparisons to the 2022 GDP deflator.

21. For instance, construction expenditures carried out this year with an eye to build roads and dams that will be completed in two or three years from now. Such interventions may affect the production of a higher level of output in the transport or agricultural or energy sector (i.e., the aggregate supply) in two or three years from now. See also footnote 3.

22. I.e., crop and animal production, hunting, etc.; the manufacture of coke and refined petroleum products; the manufacture of basic pharmaceutical products and pharmaceutical preparations; the manufacture of basic metals; the manufacture of electrical equipment; waste collection, treatment and disposal activities, as well as the recovery of materials; air transport; telecommunications; computer programming, consultancy and related activities; the activities of head offices and management consultancy activities; employment activities; security and investigation activities.

23. A shortage of data does not permit similar comparisons in 2/5 of all industries of economic activity. Among the remaining industries, there are cases in which the PPI fell or rose by less than 10% (industries 61, 62, 63, 78, 80), rose by 10-20% (industries 01, 50), rose by about 20% (industries 51, 53), rose by 20-30% (industry 53), rose by 30-50% (sectors C and E).

FIGURE 7

The evolution of labor force participants and non-participants aged 15 years or older (million people), 1st quarter 2001 – 2nd quarter of 2021 (2001.A – 2022.B)

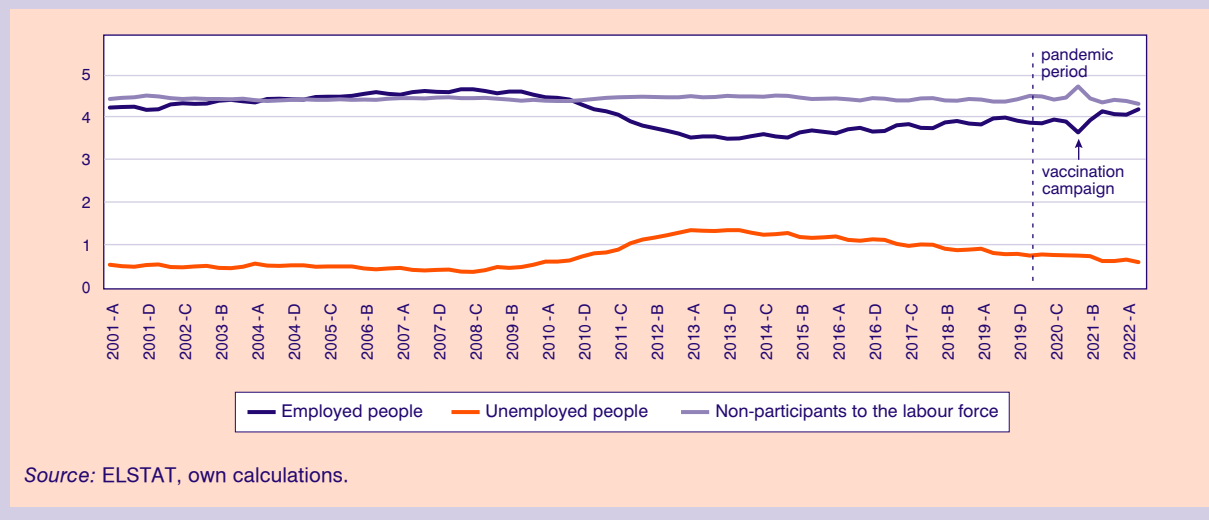


TABLE 1 The evolution of sectoral employment in Greece in terms of the figures of the first two quarters of 2022 compared to the corresponding figures of 2019 (NACE Rev. 2)

The sectors associated with codes A, B, etc. are listed in Table 2.

Sectors in which the number of employed people increased in one quarter and decreased in the other:

A, B, I, J, N (less than $\pm 5\%$), T, U (more than ± 5 and less than $\pm 15\%$).

Sectors in which the number of employed people increased during both quarters:

H (less than 5%), C, D, G, O, P (more than 5% and less than 15%),
L, M (more than 15%),
E (in one quarter less than 5%, in the other quarter more than 5% and less than $\pm 15\%$),
Q, R, S (in one quarter more than 5% and less than 15%, in the other quarter more than 15%).

Sectors in which the number of employed people decreased during both quarters

F (less than -5%),
K (more than -5% and less than -15%).

Source: ELSTAT, own calculations.

(c) eleven industries achieved much higher turnover compared to the same period in 2019 (by 20-28% in one quarter, 23-56% in the other quarter); (d) 24 sectors achieved very high turnover compared to the same

period in 2019 (by 31-95% in one quarter, 33-110% in the other quarter). At the same time, only seven industries achieved a lower turnover compared to the same period of 2019;²⁴ 13 industries reported lower turnover

24. The reasons vary. For instance, in one case, the development is attributed to the decision to phase-out the use of coal in the EU –a policy temporarily suspended in the summer of 2022 due to the energy crisis (Colonas, 2022). In another case, the development is attributed to the restructure of Energean PLC, an international hydrocarbon exploration and production company (Katzayiannaki, 2022). In a third case, the development is attributed to sanctions against Russia that hit domestic furriers (Reuters, 2022).

TABLE 2 The taxonomy of 21 sectors and 85 industries of economic activity (NACE Rev. 2)

A. Agriculture, forestry & fishing	
01 Crop & animal production, hunting, related service activities	02 Forestry & logging
	03 Fishing & aquaculture
B. Mining & quarrying	
05 Mining of coal & lignite	08 Other mining & quarrying
06 Extraction of crude petroleum & natural gas	09 Mining support service activities
07 Mining of metal ores	
C. Manufacturing	
10 Manufacture of food products	23 Manufacture of other non-metallic mineral products
11 Manufacture of beverages	24 Manufacture of basic metals
12 Manufacture of tobacco products	25 Manufacture of fabricated metal products, except machinery & equipment
13 Manufacture of textiles	26 Manufacture of computer, electronic & optical products
14 Manufacture of wearing apparel	27 Manufacture of electrical equipment
15 Manufacture of leather & related products	28 Manufacture of machinery & equipment not elsewhere classified
16 Manufacture of wood, products of wood & cork (except furniture), articles of straw, plaiting materials	29 Manufacture of motor vehicles, trailers & semi-trailers
17 Manufacture of paper & paper products	30 Manufacture of other transport equipment
18 Printing & reproduction of recorded media	31 Manufacture of furniture
19 Manufacture of coke & refined petroleum products	32 Other manufacturing
20 Manufacture of chemicals & chemical products	33 Repair & installation of machinery & equipment
21 Manufacture of basic pharmaceutical products & pharmaceutical preparations	
22 Manufacture of rubber & plastic products	
D. Electricity, gas, steam & air conditioning supply	
35 (same as D)	
E. Water supply, sewerage, waste management & remediation activities	
36 Water collection, treatment & supply	39 Remediation activities & other waste management services
37 Sewerage	
38 Waste collection, treatment & disposal activities, recovery of materials	
F. Construction	
41 Construction of buildings	43 Specialized construction activities
42 Civil engineering	
G. Wholesale, retail trade & repair of motor vehicles & motorcycles	
45 Wholesale, retail trade & repair of motor vehicles & motorcycles	47 Retail trade, except of motor vehicles & motorcycles
46 Wholesale trade, except of motor vehicles & motorcycles	
H. Transportation & storage	
49 Land transport & transport via pipelines	52 Warehousing & support activities for transportation
50 Water transport	53 Postal & courier activities
51 Air transport	
I. Accommodation and food service activities	
55 Accommodation	56 Food & beverage service activities

TABLE 2 (continued)

J. Information & communication	
58 Publishing activities	61 Telecommunications
59 Motion picture, video & television program production, sound recording & music publishing activities	62 Computer programming, consultancy & related activities
60 Programming & broadcasting activities	63 Information service activities
K. Financial & insurance activities	
64 Financial service activities, except insurance & pension funding	66 Activities auxiliary to financial services & insurance activities
65 Insurance, reinsurance & pension funding, except compulsory social security	
L. Real estate activities	
68 (same as L)	
M Professional, scientific & technical activities	
69 Legal & accounting activities	73 Advertising & market research
70 Activities of head offices, management consultancy activities	72 Scientific research & development
71 Architectural & engineering activities, technical testing & analysis	74 Other professional, scientific & technical activities
	75 Veterinary activities
N Administrative & support service	
77 Rental & leasing activities	80 Security & investigation activities
78 Employment activities	81 Services to buildings & landscape activities
79 Travel agency, tour operator reservation service & related activities	82 Office administrative, office support & other business support activities
O. Public administration & defense, compulsory social security	
84 (same as O)	
P. Education	
85 (same as P)	
Q. Human health & social work activities	
86 Human health activities	88 Social work activities without accommodation
87 Residential care activities	
R. Arts, entertainment & recreation	
90 Creative, arts & entertainment activities	92 Gambling & betting activities
91 Libraries, archives, museums, other cultural activities	93 Sports activities & amusement & recreation activities
S. Other service activities	
94 Activities of membership organizations	96 Other personal service activities
95 Repair of computers & personal and household goods	
T. Activities of households as employers of domestic personnel. Undifferentiated goods & services, production activities of private households for own use	
97 and 98 (same as T)	
U. Activities of extraterritorial organizations & bodies	
99 (same as U)	

TABLE 3 The evolution of annual turnover across industries in Greece in the first two quarters of 2022 compared to the corresponding figures of 2019 (NACE Rev. 2)

The industries associated with codes 01, 02, 03, etc. are listed in Table 2.

Industries in which turnover increased in both quarters, but in one quarter less than 10%:

08, 11, 12, 18, 37, 53,^a 55, 56, 74, 80,^b 82, 87, 90, 92, 94, 96.

Industries in which turnover increased in both quarters by:

10-20% 13, 23, 32, 33, 47, 50,^c 59, 60, 69, 73, 77.

20-30% 10, 28, 31, 39, 43, 45, 46, 71, 72, 86, 95.

30% or more 01, 02, 03, 16, 17, 19, 20, 21, 22, 24, 25, 26, 27, 29, 38, 41, 52, 62,^e 66, 70, 75, 78,^f 81, 85.

Industries in which turnover increased in one quarter but decreased in the other:

The increase was by less than 10%: 14, 58, 61, 68, 91.

The increase was by 10-20%: 36, 42, 49, 88.

The increase was by 30% or more: 07, 30, 51,^h 93.

Industries in which turnover decreased in both quarters:

05, 06, 09, 15, 63,ⁱ 65, 79.

a The PPI appears to have risen in the first and second quarters of 2022, respectively, by 21 and 22%, compared to 2019.

b The PPI appears to have risen in the first and second quarters of 2022, respectively, by about 0 and 2%, compared to 2019.

c The PPI appears to have risen in the first and second quarters of 2022, respectively, by 12 and 11%, compared to 2019.

d The PPI appears to have risen successively in the first six months of 2022, respectively, by 11, 13, 19, 22, 19 and 15% compared to 2019.

e The PPI appears to have fallen in the first and second quarters of 2022, respectively, by 2 and 1%, compared to 2019.

f The PPI appears to have risen in the first and second quarters of 2022, respectively, by 2 and 1%, compared to 2019.

g The PPI appears not to have changed in the first and second quarters of 2022 compared to 2019.

h The PPI appears to have risen in the first and second quarters of 2022, respectively, by 22 and 19%, compared to 2019.

i The PPI appears to have fallen in the first and second quarters of 2022 by 1%, compared to 2019.

In the underlined cases, the PPI appears to have successively risen in the first six months of 2022, respectively, by 31, 36, 46, 49, 42 and 40%, compared to 2019.

Source: ELSTAT, own calculations.

in one quarter and higher turnover in the other quarter (2-56% higher) compared to the same period in 2019; while in three industries (namely, industries 35, 64, 84) the corresponding figures were not comparable according to ELSTAT.

It is a fairly positive situation from a microeconomic point of view, consistent with an expanding aggregate demand.

Another interesting feature is that, while the patterns of employed and unemployed people by and large reflected each other (like opposite mirror images), and the figures of non-participants did not change much

over a long time (i.e., did not appear to respond to changes in either the number of employed or the number of unemployed); during the pandemic, employment and non-participation patterns began to clearly reflect each other like opposite mirror images. (See Figure 5.) To the extent that the flows of individuals among the three states (employment, unemployment, non-participation in the labor market) are more apparent than before, it might be better if future developments and interventions in any one of the three states were considered with an eye to take into account the likely effects on (or the responses from) the other two.

6. Conclusions – the road ahead

Recognizing that the country operates in an environment of successive international crises (financial, health, supply-chain, energy, climate, etc.) requires the formulation of a sustainable development plan involving distinct (preferably disconnected) key sectors to stimulate or raise production in the future. Ideally, aggregate demand side interventions will not be frequent or dominant, but will be employed in special circumstances (much like a *medicine or booster*) in order to facilitate crucial structural transformations or maintain a critical standard of living.

Ideally, decision makers and the society at large will mull over, talk about, and refine new and old ideas or practices employed elsewhere, in the direction of expanding the aggregate supply, and to move in the particular direction. The plan itself should point towards matching human and manmade capital across space and sectors that produce high added value, profitable goods and services that may be desired by foreign markets and stand out in international competition.²⁵ This ought to raise real national income and bring in the currency needed (a) to import goods and services that are costly to produce domestically and (b) to repay the debt.

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25. By contrast, the income generated by domestically consumed goods and services is constrained by the purchasing capacity of domestic buyers.

APPENDIX 1 The likely impact on prices and the GDP of deregulating Sunday shopping in Greece

EU law allows each member state to set its own policy concerning work on Sundays, so in 2012, a partial removal of the restriction was proposed in Greece in order to allow small shops to voluntarily operate on Sundays if the owner so wished. In 2013, the parliament devolved the particular deregulation decision to local authorities, and in 2017, it broadened the scope to include large retailers as well. In practice, in most areas of Greece, both large and most small retailers are generally closed on non-holiday Sundays.

If the deregulation regarding small shops were extended to many more areas across the country, then, *ceteris paribus*:

- A rise in the supply of goods on Sundays ought to lower prices throughout the week: With more and different shops open on Sundays to better meet the needs of consumers (so that they may shop for groceries and something to eat, buy a gift, etc.), the Sunday supply curve for goods ought to shift to the right, causing prices to fall on Sundays. With a corresponding decrease in the demand for such goods during the other days of the

week (as some needs are satisfied on Sundays), prices ought to fall on the other days as well. By contrast, the overall quantity of goods produced and sold is not expected to decrease.

- Based on the quantity theory of money in the form of Fisher's equation of exchange (1911), $M \times V = P \times Y$, where M is the amount of money in existence, V is the transaction velocity of money (i.e., the average number of times a unit of money turns over or changes hands to effectuate transactions in a year), P is the average price level, and Y is the total value of all items transacted (real income); allowing transactions and money to circulate on an extra day of the week (i.e. an increase in V) will increase money circulation and income generation in the course of the week. Ultimately, $P \times Y$, i.e., the nominal GDP will increase. Though the mechanics may push prices in the opposite way compared to the direction described in the previous paragraph, to the extent that Y is affected (however slightly), real income (output) ought to increase.