

The Association between the Health Crisis and Economic Evolutions at Country Level. A comparative Analysis

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Abstract

The present paper aims to identify how economic evolutions related to health conditions during the Covid-19 pandemic. The research includes an analysis on the evolutions of the health and economic conditions during the Covid-19 health crisis and also on the way they are linked to each other. The investigation is conducted at country level and is exemplified on two European countries, namely Italy and Greece. The methodology employed was based on three types of analyses: descriptive, correlation and comparative analyses that used secondary data from international organizations. Results illustrate that the economic life was affected by the Covid-19 conditions (Covid-19 incidence and the associated restrictions), with inflation being the most affected in both countries. At the same time, international trade was affected differently in the two countries, with Italy being negatively and more intensively affected than Greece, for which the association was positive and rather weak.

Keywords: Covid-19 health crisis, economic impact, macroeconomic evolutions, international trade, containment measures, Italy, Greece.

JEL classification: F10, F18, F40.

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1. Introduction

The Covid-19 pandemic had as results both a health crisis, but also an economic crisis. The unparalleled and unanticipated consequences of the Covid-19 outbreak determined disruptions at various levels (Tudorache & Nicolescu, 2022; 2023), such as global level (Bremmer, 2020; Manyika, 2020), country level (Aramato & Vokoun, 2020), industry level (Ibn-Mohammed et al., 2021), company level (Zahra, 2021) and individual level (Belhadi et al., 2021).

The economic influences of the Covid-19 health crisis on the world economy, but also on national economies were seen as being profound and as determining a global economic crisis during that period (Tudorache & Nicolescu, 2022; Tudorache, 2021). In these circumstances, there are calls for the necessity to study more deeply the influence of the Covid-19 health crisis and conditions on the economic life (Lucio et al., 2022) and at different levels of economies and societies (Zahra, 2021).

The present paper tries to answer to such calls by proposing an investigation of the Covid-19 conditions (Covid-19 incidence and deaths, governmental restrictions) and their association with aspects of the economic life at macrolevel (GDP,

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unemployment, inflation and foreign trade) for two different countries, Italy and Greece, by employing three types of analyses: descriptive, correlation and comparative.

The organization of the paper is the following: next section looks at other studies on the impact of Covid-19; the methodology section gives details on the research methods employed and the types of analyses conducted; the results section presents the findings of the descriptive, correlation and comparative analyses and the last section discusses the findings, relates them with the literature and draws the conclusions.

2. The impact of Covid-19 health crisis in the Literature

Once the Covid-19 pandemic outbreak, researchers were interested to investigate the evolutions of the health crisis and especially its consequences that were identified to be at all possible levels, starting with global level and continuing with national level, domain level, company level and personal level (Belhadi et al., 2021; Ibn-Mohammed et al., 2021, Tudorache & Nicolescu, 2023). From the multiple possible perspectives from which the Covid-19 consequences can be analyzed, for the present research are of interest the ones that focus on the economic impact of the pandemic. From this perspective, scholars identified at global level that the Covid-19 health crisis determined a global economic recession (Aramayo & Vokoun, 2020). The disruption of global value chains and of international trade, especially at the beginning of the health crisis was also acknowledged by researchers (Garofali, 2020; Tudorache, 2021; Tudorache & Nicolescu, 2023; Zahra, 2021). At national level, studies showed that the Covid-19 had diverse influences on economic aspects and identified declines in economies (Aramayo & Vokoun, 2020) and unfavourable influences on the GDP, unemployment and inflation of European countries (Tudorache & Nicolescu, 2022). At industry level, it was found that some industries were negatively affected during the Covid-19 period (especially services such as travelling, hotelling, restaurants, cosmetics), while others were positively influenced (online shopping, medical supplies, internet technologies) (Ibn-Mohammed et al., 2021; Zahra, 2021). At company level, bankruptcies were registered by numerous companies during the Covid-19 health crisis, especially small and medium sized companies (Amankwan-Amoah et al., 2021), while other companies had to adjust their activities according the new regulations (remote work, use of digital technologies) (Zahra, 2021). Other aspects that were studied and reflect an economic influence of Covid-19 conditions refer to the adverse impact that the governmental measures taken to contain the spread of the Coronavirus had on economic activities, such as trade and international trade (Lucio et al., 2022; Plümper & Neumeier, 2022; Tudorache et al., 2023), for example. The present paper aims to complete results of such studies with more evidence at country level on the economic influence of the Covid-19 pandemic's conditions.

3. Methodology

The present study aims to identify general economic influences of the Covid-19 health crisis at macro-level, by the example of two European countries. The research question that the paper tries to answer is: RQ: “What was the Covid-19 pandemic influence on macro-economic evolutions at country level?”. The main objectives of the research are: a) to identify and characterize the health and economic contexts during the Covid-19 crisis at country level; b) to analyze the association between health conditions and economic evolutions at country level and c) to compare countries from the two above perspectives.

In order to reach these objectives, the present research comprises three categories of analyses: first, a descriptive analysis of the health and economic indicators in the selected countries; second, the correlation analysis between health factors and economic aspects in the selected countries and the third is a comparative analysis between the two selected countries. The descriptive analysis includes time series description for the pre-Covid-19 period and during the Covid-19 period for the economic indicators and of the health indicators only for during the Covid-19 health crisis. The correlation analysis includes the computation and interpretation of the Pearson correlation coefficient (r), analysis that aims to identify the existence of an association between health variables and economic variables during the Covid-19 health crisis. The comparative analysis includes the comparison between the selected countries from the perspective of both the descriptive and the correlation analyses.

The European countries included in the study are Italy and Greece, as two countries that were highly affected by the Covid-19 health crisis (Santucci et al., 2023) and that have different profiles in terms of size (in 2023 Italy had 58,870,762 million inhabitants being a large European country and Greece had 10,341,277 inhabitants, being a smaller European country) (Worldometer, 2024). Data about different indicators was collected for periods of time comprised between 2019-2023, depending of the availability of data for each indicator.

The descriptive analysis characterized in terms of evolution in time, the health and the economic contexts at country level. The health context and evolutions were descriptively characterized and analyzed based on indicators such as the number of Covid-19 cases, the number of Covid-19 deaths and the strength of the containment measures taken by authorities, measured by the Stringency indexes. The economic context and evolutions were characterized based on macrolevel indicators such as: GDP change, unemployment, inflation, international trade in terms of total exports and total imports of a country. The data was collected from international sources of data such as Eurostat, World Trade Organization and others. Table 1 presents the indicators analyzed, the periods of analysis and the bibliographical sources used.

Data collected and sources

Table 1

Types of indicators	Indicators	Time period	Frequency in analysis	Bibliographical Reference
Economic indicators	GDP change	2019-2023	quarterly	Eurostat
	Unemployment	2019-2023	monthly	Eurostat
	Inflation	2019-2023	monthly	Eurostat
	International trade	2020-2021	monthly	World Trade Organization
Health related indicators	Number of Covid-19 cases	2020-2023	monthly	European Centre for Disease Prevention and Control of EU
	Number of Covid-19 deaths	2020-2023	monthly	European Centre for Disease Prevention and Control of EU
	Stringency index	2020-2023	monthly	Oxford Coronavirus Government Response Tracker - Our World in Data

Source: author.

The correlation analyses included the investigation of two types of associations: a) the association between the number of Covid-19 cases (computed as number of Covid-19 cases/1000 inhabitants) and macrolevel indicators such as unemployment and inflation and b) the association between the Stringency indexes and the exports and imports per one million inhabitants.

The comparative analysis included comparisons in terms of evolutions in time of the health and macroeconomic indicators in the two countries, as well as the comparisons of the results of the correlation analyses in the two countries.

4. Results

This section presents the results of the three types of analyses (descriptive, correlation and comparative) conducted in the two selected countries, respectively Italy and Greece.

Descriptive analysis: health and economic contexts

The health context

Health evolutions during the Covid-19 period for Italy and Greece are illustrated in Table 2 and in Graphic 1A-C. Aspects such as evolutions of main indicators depicting the Covid-19 evolutions (as number of cases and number of deaths) are included in order to characterize the health situation at country level. Also, another relevant aspect related to the Covid-19 health crisis that is included in the

present analysis refers to the level of restrictions imposed by governments in the two countries during the health crisis, measured based on the Stringency indexes.

The health context in Italy and Greece, 2020-2023

Table 2

Month and year	Number of Covid-19 cases*		Number of Covid-19 deaths*		Stringency index (values 0-100)*,**	
	Italy	Greece	Italy	Greece	Italy	Greece
January 2020	2	0	0	0	1.63	0.00
February 2020	2153	6	69	0	31.17	2.20
March 2020	102834	1326	13570	42	80.42	54.66
April 2020	108249	1348	17168	102	90.65	84.26
May 2020	20264	298	3444	35	73.68	70.76
June 2020	7034	488	1102	12	67.59	51.85
July 2020	8162	1444	380	17	66.99	56.63
August 2020	29456	5788	176	57	66.61	56.14
September 2020	39645	7545	434	122	65.80	60.54
October 2020	286700	25874	4391	262	68.01	56.43
November 2020	905113	66421	19225	1798	81.79	75.52
December 2020	507319	33707	19811	2555	80.86	83.54
Average 2020	-	-	-	-	65.00	54.81
January 2021	501449	17039	12614	823	76.55	81.75
February 2021	378284	35924	8859	727	75.93	81.08
March 2021	724427	65755	10691	1459	79.33	88.44
April 2021	581704	95845	10850	2619	78.67	84.63
May 2021	507319	53778	4028	1471	70.55	67.55
June 2021	566268	18093	1049	589	70.84	58.11
July 2021	239139	73391	313	316	61.31	58.40
August 2021	40501	86260	1072	705	53.79	63.08
September 2021	103064	76651	1829	1258	57.34	68.93
October 2021	114564	82255	983	1044	50.16	71.37
November 2021	248341	181867	1673	2033	49.84	71.30
December 2021	1505755	42071	4487	2962	50.69	73.26
Average 2021	-	-	-	-	64.69	72.27
January 2022	4556214	647013	9500	2518	68.02	79.2
February 2022	1775563	478425	8415	2343	64.84	73.32
March 2022	2144557	673417	5445	1941	60.23	60.21
April 2022	1664568	250291	4309	1463	55.57	58.3
May 2022	883379	115646	3078	576	46.62	38.71
June 2022	1438332	281120	2189	488	44.5	35.71
July 2022	2241958	456809	4355	1105	44.5	32.22

	Number of Covid-19 cases*		Number of Covid-19 deaths*		Stringency index (values 0-100)*,**	
August 2022	757839	252885	203	1150	44.5	27.38
September 2022	737671	127914	488	624	42.12	27.38
October 2022	1021204	165875	2242	553	42.12	27.38
November 2022	805288	159023	1684	576	43.94	27.38
December 2022	616603	162902	2247	785	43.27	27.38
Average 2022	-	-	-	-	49.94	42.69
January 2023	250356	113672	1981	737	-	-
February 2023	118789	51254	1124	428	-	-
March 2023	113280	45686	994	365	-	-
April 2023	93687	28563	721	203	-	-
May 2023	63944	27555	629	217	-	-
June 2023	1438332	14089	329	141	-	-
July 2023	15525	9835	118	76	-	-
August 2023	54836	29937	283	167	-	-
September 2023	142416	38996	539	183	-	-
October 2023	138214	47147	731	239	-	-
November 2023	109042	33119	499	190	-	-

Note:* Last available data for Covid-19 cases and deaths is November 2023 and the last available data for the Stringency indexes is December 2022.

**Values close to zero illustrate a low level of restrictions, while those close to 100 illustrate a high level of restrictions.

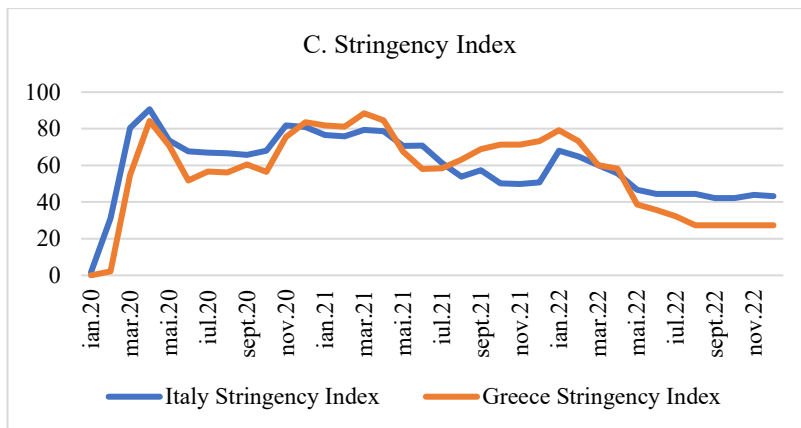
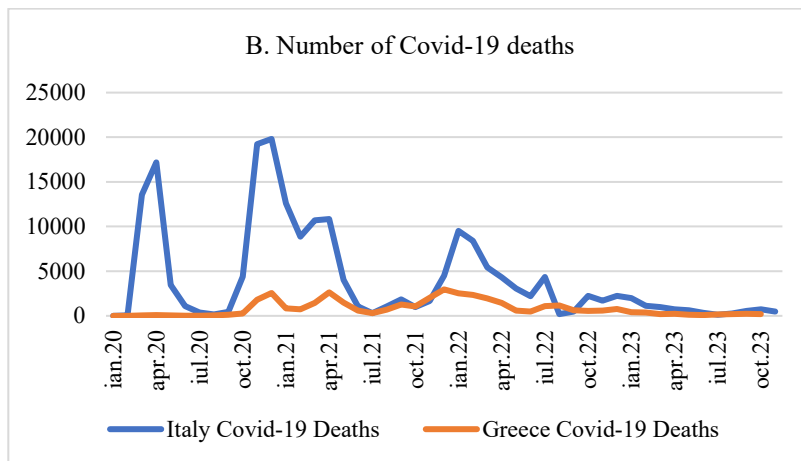
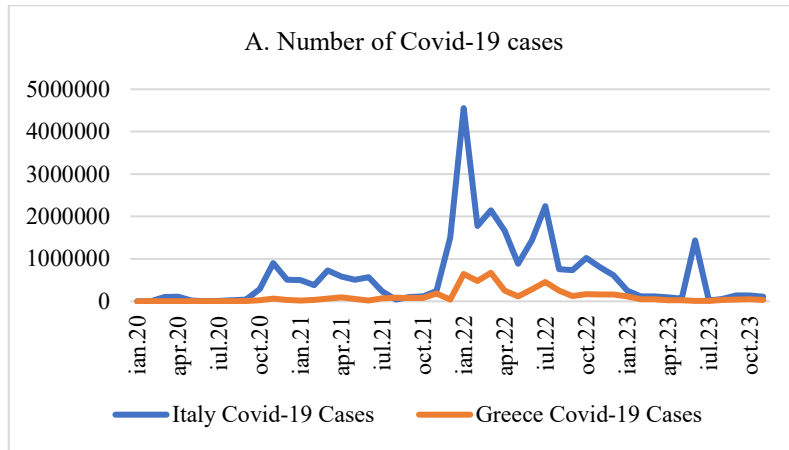
Source: author based on the international sources presented in Table 1.

As it can be noticed, the health situation during the Covid-19 health crisis was characterized by a large number of Covid-19 cases and Covid-19 deaths. Both the number of cases and the number of deaths evolved in both countries in numerous waves in the period 2020-2023, depicting the different variants of the Coronavirus that was revived at certain time intervals. The waves had ups and downs at various levels and were disposed differently in time.

Italy

The number of Covid-19 cases was large at the beginning of the health crisis during 2020, but it actually peaked in 2022, when vaccinations were in place, containment measures started to relax, as the strength of the virus was decreasing at the time and people were more protected due to vaccinations.

However, the Covid-19 related deaths had a different evolution as compared to the evolution of the Covid-19 cases. The number of deaths was very large in Italy at the beginning of the health crisis, in 2020 when most countries were unprepared to face the new unknown virus. The number of deaths related to Covid-19 virus peaked at around 17,000 in April 2020 and around 19-20,000 in November-December 2020.



Graphic 1. Health situation in the period 2020-2023

Source: author.

The Stringency indexes, that reflect the strength of the restrictive measures put in place by authorities to contain the spread of the virus, were very high at the beginning of 2020, reaching levels of 90 out of 100 of the Stringency index value and illustrated extremely strong restrictions. They were kept quite high during 2020 and 2021 and only in 2022 the Stringency index started to decrease in Italy and with a higher pace towards the end of 2022, reflecting a diminishing trend in the restrictions. However, they were kept at least at a medium level with values of 40-50 of the Stringency index, until the calculation of the restrictions have been discontinued at the end of 2022.

Greece

In Greece the number of Covid-19 cases was low at the beginning of the health crisis in 2020, only to increase at the end of 2020 and during 2021, depicting a strong and prolonged wave of the Covid-19 in that period. In 2022 the number of cases was kept at a high level, only to decrease in 2023.

The number of deaths that were related to Covid-19 were very low at the beginning and during 2020, basically due to, on the one hand, the fact that Greece had not very strong international connections and interdependencies when the crisis outbreaked at the beginning of 2020 and then, later on the restrictions were very strong in Greece, limiting the spread of the virus. The number of deaths peaked in Greece at the end of 2020 and after that at the end of 2021 and beginning of 2022, with numbers around 2000-2500 monthly.

The analysis of the Stringency indexes' evolution in Greece illustrates that the authorities started with very strong restrictions (Stringency index reaching 85 in the first part of 2020). This was followed by a level of relative relaxation, due to a downward trend of the number of cases during the summer of 2020. But at the end of 2020 restrictions were strengthened again with values of the index being around 80 and continued to remain high (values of 60-70) during 2021. In 2022 a decreasing trend was encountered, the strength of the restrictions was situated at medium levels (values of 40-50) according to the Stringency indexes.

The economic context

Table 3 and Graphic 2A and B depict the economic evolutions during the Covid-19 health crisis in the two analyzed countries. For this purpose macro-level economic indicators and their evolutions were investigated in Italy and Greece in the period 2019-2023, including the pre-Covid-19 period, the two main years of the Covid-19, respectively 2020-2021 and the end period of Covid-19, respectively 2022-2023.

Italy

In Italy, The GDP change in the pre-Covid-19 period (2019) was rather stagnant with a small decrease at the end of 2019. However, when the Covid-19 health crisis outbreaked, the GDP in Italy has known large decreases (-5.7% in the first quarter of 2020 and -12.9% in the second quarter of 2020). In the third quarter of

2020, the GDP recovered (with a 15.6% increase rate, higher than the previous decrease rate). After that, changes in GDP consisted of very small increases (between 0-2.7%) during 2021.

The economic context in Italy and Greece, 2019-2023

Table 3

Month and year	Unemployment (%)		Inflation (%)		GDP change, quarterly (%)	
	Italy	Greece	Italy	Greece	Italy	Greece
Jan 2019	10.4	19.4	0.9	0.5		
Febr 2019	10.5	19.4	1.1	0.8		
Mar 2019/2019Q1	10.2	18.5	1.1	1.0	0.0	0.9
Apr 2019	10.3	18.3	1.1	1.1		
May 2019	10.0	17.5	0.9	0.6		
Jun 2019/2019Q2	9.6	17.2	0.8	0.2	0.2	0.8
Jul 2019	9.6	17.8	0.3	0.4		
Aug 2019	9.4	17.4	0.5	0.1		
Sept 2019/2019Q3	9.8	17.3	0.2	0.2	0.1	0.0
Oct 2019	9.5	17.1	0.2	-0.3		
Nov 2019	9.8	17.1	0.2	0.5		
Dec 2019/2019Q4	9.7	17.2	0.5	1.1	-0.4	-0.2
Jan 2020	9.7	16.7	0.4	1.1		
Febr 2020	9.5	16.4	0.2	0.4		
Mar 2020/2020Q1	7.7	17.4	0.1	0.2	-5.7	-1.6
Apr 2020	7.5	17.7	0.1	-0.9		
May 2020	8.7	19.6	-0.3	-0.7		
Jun 2020/2020Q2	9.5	20.3	-0.4	-1.9	-12.9	-14.2
Jul 2020	10.1	17.0	0.8	-2.1		
Aug 2020	10.0	17.0	-0.5	-2.3		
Sept 2020/2020Q3	10.0	17.1	-1	-2.3	15.6	5.6
Oct 2020	10.0	17.3	-0.6	-2.0		
Nov 2020	9.6	17.5	-0.3	-2.1		
Dec 2020/2020Q4	9.8	17.0	-0.3	-2.4	-1.6	3.9
Jan 2021	10.2	16.4	0.7	-2.4		
Febr 2021	10.2	16.2	1	-1.9		
Mar 2021/2021Q1	10.1	17.2	0.6	-2.0	0.3	4.2
Apr 2021	10.2	17.0	1	-1.1		
May 2021	9.9	15.4	1.2	-1.2		
Jun 2021/2021Q2	9.4	14.8	1.3	0.6	2.7	2.1
Jul 2021	9.1	14.2	1	0.7		
Aug 2021	9.1	13.8	2.5	1.2		

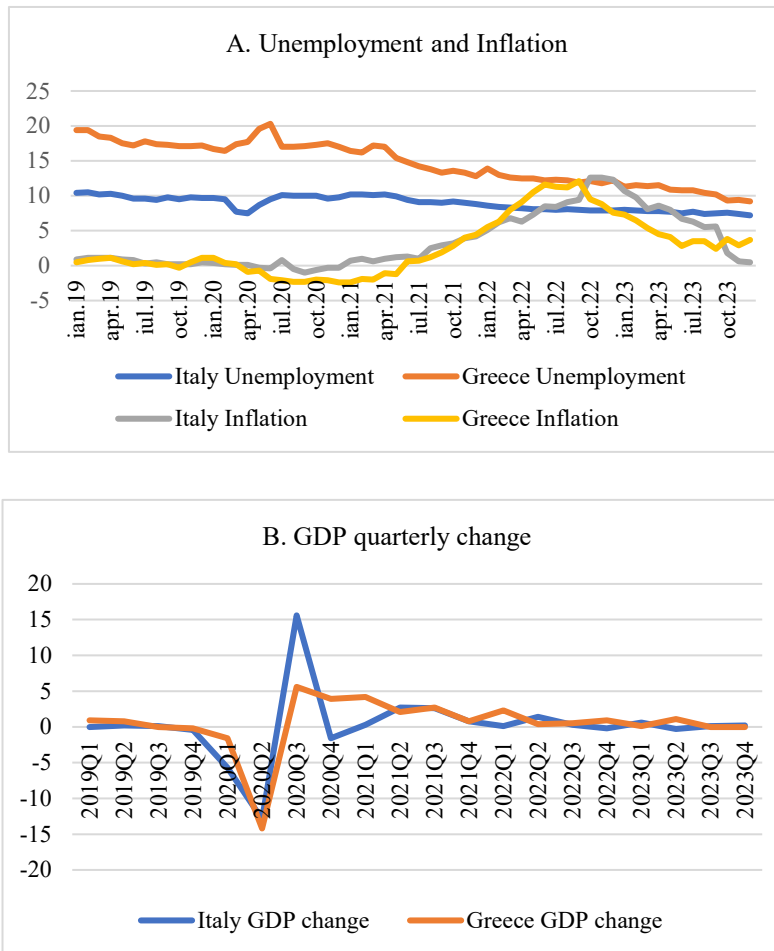
	Unemployment (%)		Inflation (%)		GDP change, quarterly (%)	
Sept 2021/2021Q3	9.0	13.3	2.9	1.9	2.6	2.7
Oct 2021	9.2	13.6	3.2	2.8		
Nov 2021	9.0	13.3	3.9	4.0		
Dec 2021/2021Q4	8.8	12.8	4.2	4.4	0.8	0.8
Jan 2022	8.6	13.9	5.1	5.5		
Febr 2022	8.4	13.0	6.2	6.3		
Mar 2022/2022Q1	8.3	12.6	6.8	8.0	0.1	2.3
Apr 2022	8.2	12.5	6.3	9.1		
May 2022	8.1	12.5	7.3	10.5		
Jun 2022/2022Q2	8.1	12.2	8.5	11.6	1.4	0.4
Jul 2022	8.0	12.3	8.4	11.3		
Aug 2022	8.1	12.2	9.1	11.2		
Sept 2022/2022Q3	8.0	11.9	9.4	12.1	0.3	0.5
Oct 2022	7.9	12.1	12.6	9.5		
Nov 2022	7.9	11.8	12.6	8.8		
Dec 2022/2022Q4	7.9	12.2	12.3	7.6	-0.2	0.9
Jan 2023	8.0	11.3	10.7	7.3		
Febr 2023	7.9	11.5	9.8	6.5		
Mar 2023/2023Q1	7.8	11.4	8.1	5.4	0.6	0.1
Apr 2023	7.8	11.5	8.6	4.5		
May 2023	7.7	10.9	8.0	4.1		
Jun 2023/2023Q2	7.5	10.8	6.7	2.8	-0.3	1.1
Jul 2023	7.7	10.8	6.3	3.5		
Aug 2023	7.4	10.4	5.5	3.5		
Sept 2023/2023Q3	7.5	10.2	5.6	2.4	0.1	0.0
Oct 2023	7.6	9.3	1.8	3.8		
Nov 2023	7.4	9.4	0.6	2.9		
Dec 2023/2023Q4	7.2	9.2	0.5	3.7	0.2	-

Source: author based on the international sources presented in Table 1.

However, starting 2022 and continuing in 2023 the situation worsened in Italy with even smaller GDP quarterly increases of under 1% and in two separate quarters there were encountered negative growths. The unfavourable evolutions of the country's economic situation in the years 2022-2023 were not related to the Covid-19 presence, but rather to other international events with a much higher impact on economic evolutions such as the start of the war between Russia and Ukraine in February 2022 and the consequent energy crisis (Garicano et al., 2022).

The unemployment was at a high level in Italy at the beginning of the Covid-19 crisis, with unemployment rates of 10% in 2019. In 2020, when the Covid-19 health crisis started unemployment decreased for a little while, reaching levels of 8.5%, only to come back to the 10% pre-Covid-19 levels during the second half of 2020 and the first half of 2021. After that, unemployment had a decreasing trend in 2022 and 2023 reaching 7.2% in December 2023.

Inflation was low in Italy before the start of the health crisis, with levels of 0.2%-1% in 2019 and it remained low during 2020, with a number of months when the inflation was negative, depicting a decrease in prices, due to the decrease in demand. At the end of 2021, inflation started to increase in Italy peaking after the start of the Russia-Ukraine military conflict with values of 10%-12% in 2022 when a profound energy crisis took place in Europe due limited supply of energy, as Russia was imposed economic restrictions from European Union and other countries. Inflation started to decrease in Italy in 2023, so that at the end of 2023, in December, the inflation rate was 0.5% being recovered.



Graphic 2. Economic situation in the period 2020-2023

Source: author

Greece

Greece started at the beginning of the Covid-19 crisis with a situation depicting a minimum economic growth, with values less and around 1% in 2019. Sharp decreases of the quarterly GDP took place in the first two quarters of 2020 (up to -14%), followed by recovery, but at a smaller pace. During both 2022 and 2023 the economy of Greece was rather stagnant with around zero GDP quarterly growth rates.

Unemployment in Greece in the pre-Covid-19 period was very high, with levels of almost 20% in 2019. The level of unemployment remained high during the main years of the Covid-19 health crisis, respectively 2020, with values of around 17% and decreasing to 13% in the months of 2021. Unemployment followed constant decreasing trends in 2022 and 2023, reaching at the end of 2023 the level of 9%.

Inflation was low in Greece in the period prior to Covid-19 with levels under 1%. During the main years of the health crisis, 2020 and 2021 inflation decreased in Greece reaching negative figures that illustrate that prices decreased during that period in Greece. The main explanation is associated with a decreased demand of goods and services during Covid-19 period. At the end of 2021 inflation began to raise in Greece and sharply increased during 2022 reaching two digits figures (for example 12% in September 2022). In 2023 inflation started to decrease, reaching at the end of 2023 the level of 3.7%, the country not being recovered from this perspective.

Correlation analysis: the association between the health crisis and economic evolutions

This section presents the results of the correlation analyses conducted in the two selected countries, respectively Italy and Greece. The two types of analyses looked at: a) the association between the Covid-19 cases and the unemployment and inflation, as important macroeconomic indicators and b) the association between international trade at country level and the strictness of the governmental restrictions taken during the Covid-19 crisis, measured through the Stringency index. In order to do this, there were computed the following indicators: the number of Covid-19 cases/1000 inhabitants and total exports/1 million inhabitants and total imports/1 million inhabitants. Table 4 present the results of the correlation analyses and Table 5 present their interpretation.

It can be observed that the Covid-19 conditions did influence economic evolutions in the two countries, to different extents. In terms of the association between the number of Covid-19 cases/1000 inhabitants and macroeconomic aspects, inflation was more affected by the Covid-19 than unemployment, as inflation was positively associated with Covid-19, illustrating the movement of inflation and the number of Covid-19 cases in the same direction. The association was medium to strong, as the values of r were between 0.31 and 0.54, with Greece having its inflation more affected by Covid-19 than Italy.

Unemployment on the other hand, registered associations with the number of Covid-19 cases that had different directions (positive in Italy and negative in Greece) and different strengths (weak in Italy and strong in Greece).

In terms of the association between international trade components and the intensity of the restriction measures, it was encountered a negative association that was weak to medium in Italy and a positive association that was weak in Greece.

Correlations between the health and economic aspects during Covid-19 health crisis

Table 4

Countries	Association between Covid-19 and macroeconomic evolutions		Association between restrictions and evolution of international trade	
	Pearson coefficient Covid-19 cases /1000 inh. with unemployment	Pearson coefficient Covid-19 cases /1000 inh. with inflation	Pearson coefficient Stringency index with exports/1 mill inh.	Pearson coefficient Stringency index with imports/1 mill. inh.
Italy	0.1417	0.3181	-0.1049	-0.3859
Greece	-0.6200	0.5474	0.2404	0.1566

Source: author

Interpretation of the correlations between the health and economic aspects during Covid-19 health crisis

Table 5

Countries	Association between Covid-19 and macroeconomic evolutions		Association between restrictions and evolution of international trade	
	Pearson coefficient Covid-19 cases /1000 inh. with unemployment	Pearson coefficient Covid-19 cases /1000 inh. with inflation	Pearson coefficient Stringency index with exports/1 mill inh.	Pearson coefficient Stringency index with imports/1 mill. inh.
Italy	Positive, Weak	Positive, Medium	Negative, Weak	Negative, Medium
Greece	Negative, Strong	Positive, Strong	Positive, Weak	Positive, Weak

Note: Interpretation of the correlation coefficient r: very weak: $r < 0.1$; weak: $0.1 < r < 0.3$; medium: $0.3 < r < 0.5$; strong: $0.5 < r < 0.7$; very strong: $r > 0.7$ (Laerd, 2020).

Source: author

Comparative analysis: Italy vs. Greece

This section presents the results of the comparative analysis conducted in order to identify similarities and differences between the evolutions of the two selected countries, respectively Italy and Greece.

In terms of the health situations, there were identified both similarities and differences in the two countries over the analyzed period. Also, in terms of the economic situations there were identified more similarities than differences, while in terms of the way the health conditions were associated to the economic evolutions, there were rather more differences than similarities between the two countries.

The main similarities encountered in the two countries as far as the evolutions of the health and economic contexts are concerned and the way they were linked, during the Covid-19 period are the following:

a) both countries started from rather similar economic situations in the pre-Covid-19 period with stagnant economies from the perspective of the GDP growth, with rather high (two digits) unemployment and low inflation (less than and around 1%).

b) in both countries, inflation was low in the pre-Covid-19 period and it continued to remain low during the main years (2020-2021) of the Covid-19 crisis, reaching negative figures in both countries. This relates to a decrease in prices in both countries (more in Greece than in Italy) during the Covid-19 period, mainly due to the decrease in demand. In the last years with Covid-19 (2022-2023), when the military conflicts appeared in the area, inflation increased massively in both countries, at different paces in different periods of time.

c) both countries imposed very high restrictive measures in order to contain the spread of the Coronavirus, the evolutions of these measures following similar patterns (as measured by the evolutions of the Stringency indexes).

d) in both countries the economic evolutions were connected with the health conditions during the Covid-19 health crisis.

e) in both countries, inflation was the economic aspect that was linked the most with the evolution of Covid-19, with a positive direction and a medium to strong intensity.

The main differences between Italy and Greece in terms of health and economic situations during the Covid-19 pandemic and their linkages, are:

a) unemployment evolved differently in the two countries: Greece started in the prior to the Covid-19 period with a higher level of unemployment than Italy that was kept high during the main years of Covid-19 and decreased continuously starting year 2021 until at the end of 2023 reached half the level from 2019 (9.2% as compared to 19.4%). By comparison, Italy maintained the high unemployment rates of 9-10% from the pre-Covid-19 period (2019) during the Covid-19 years and only in 2022, unemployment started to decrease slightly reaching 7.2% in December 2023. It can be concluded that unemployment decreased faster in Greece than in Italy.

b) the number of Covid-19 cases were much higher in Italy than in Greece, both in absolute terms and in relative terms: in the first two years of the pandemic with Italy peaking with 15.33 cases/1000 inh. in November 2020 and with 25.51 cases/1000

inh. in December 2021, while Greece had a maximum of 17.39 cases/1000 inh. in November 2021 and of 9.16 cases/1000 inh. in April 2021. The situation was similar in the period 2022-2023 when Italy had higher numbers of Covid-19 cases/1000 inh. than Greece in most months.

c) the number of Covid-19 related deaths was much higher in Italy as compared to Greece, with peaks of monthly deaths in Italy in December 2020 – 19,811 deaths, while Greece had the highest number of deaths related to Covid-19 in December 2021 – 2,962 deaths.

d) the directions and strengths of the associations between economic evolutions and health conditions were rather different in Italy and Greece: unemployment was linked in different directions with the evolution of Covid-19 (positive in Italy and negative in Greece); international trade was negatively associated with the strength of the restrictions in Italy, while in Greece it was a positive association.

The overall economic and health situations in Greece and Italy were rather similar during the Covid-19 period, but with punctual different evolutions, both in terms of economic and health aspects.

5. Discussions and conclusions

The present paper analyzed the economic and health evolutions during the Covid-19 pandemic and the way how they interrelate with each other, by concrete examples of two European countries, namely Italy and Greece. A three-fold methodology was used for this purpose including descriptive, correlation and comparative analyses for the two selected countries. The main economic aspects considered were macrolevel indicators that included GDP change, unemployment, inflation and international trade. The main health related aspects included the number of Covid-19 cases, the number of Covid-19 deaths and the intensity of the restriction measures taken by authorities to contain the virus (via the Stringency index).

The findings of this research illustrate that health and economic evolutions were related during the Covid-19 health crisis and that the pandemic had economic consequences at macrolevel in both countries. The evolution of the Covid-19 took place in waves, but restriction measures were kept at high levels in the analyzed countries, contrary to other researchers' results that state that restrictions followed the Covid-19 waves (Cascini et al., 2022). Both evolutions of the Covid-19 virus and the associate measures impacted the economic evolutions of countries, as also found in other researches (Aramayo & Vokoun, 2020; Tudorache & Nicolescu, 2022). The present analysis illustrates that economies encountered sharp decreases at the beginning of the crisis (2020) with recoveries shortly after, that were followed by economic stagnation. This economic downturn is seen as impacting intermediate inputs and other types of activities (Khorana et al., 2021).

The results show that both unemployment and inflation were influenced by the evolution of the health crisis, with inflation being affected at a higher extent. Similar findings were exposed by Lakatos (2020) who explained how lockdowns and

other associated measures disrupted the supply side and the manufacturing sectors, with unfavourable influences on both output and unemployment. Another finding relates to international trade being impacted by the pandemic and this comes to support the results of other researchers. For example, Correia et al. (2020) point out that during the Covid-19 crisis the decreased income available for households (determined by lockdowns and loss of jobs) resulted in a lower demand for products, including the imported products, therefore negatively affecting international trade. Similarly, Espitia et al. (2021) exemplify on the case of 28 countries how demand and supply shocks had negative influences on bilateral trading immediately after the Covid-19 outbreak, while Tudorache (2021) illustrated a different situation in Romania and Hungary also at the beginning of the Covid-19 health crisis.

Another category of findings of the present research refer to the similarities and differences between the two countries analyzed, Italy and Greece. Existing similarities refer to: initial similar economic conditions prior to Covid-19 outbreak; both countries kept rather high restriction measures throughout the whole period of Covid-19; in both countries the inflation reached negative levels during the Covid-19 period due to lower levels of demand as also found in other countries (Lakatos, 2020; Correia et al., 2020); in both countries, inflation was associated with the evolution of Covid-19, as it was the case in other European countries as well (Tudorache & Nicolescu, 2022).

Differences between the two countries mainly include: stronger manifestation of the Covid-19 in Italy as compared to Greece; the direction and strengths of the linkages between economic and health factors differed in the two countries; international trade in Italy was negatively and with a medium intensity associated with Covid-19 conditions and restrictions, while in Greece the association was positive and weak. Similar results were exposed by Lucio et al. (2022) who found that containment measures affected international trade. Also, the results of this research reinforce the findings of other studies that point out that the effects of the Covid-19 conditions on foreign trade can be diverse and even divergent, highly depending on various national related factors or on product category and industry (Tudorache & Nicolescu, 2023).

The main conclusion is that health crises influence economic evolutions of countries and that policy makers need to take measures to support economies and their economic relationships at international level (Boffardi et al., 2022) in such difficult periods.

The contributions of the present research relate to the following: the findings come to offer more evidence about the influence of the Covid-19 conditions on economic aspects at country level; also, the analyses conducted can constitute lessons for authorities for making appropriate decisions to diminish the negative influences of health crises on the economy.

Also, the limitations of the present study relate to the low number of countries considered (only two) and to the fact that only macrolevel aspects were analyzed in relationship with the Covid-related evolutions. Future research can include more countries in the analysis and deepen the investigation at industry or company level.

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