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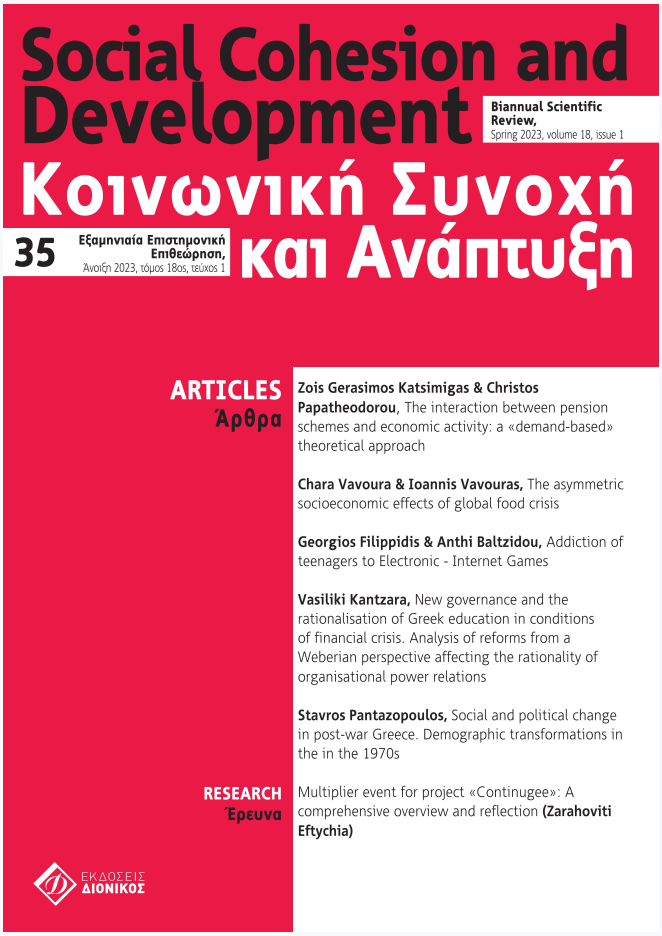

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Chara Vavoura, Ioannis Vavouras

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The asymmetric socioeconomic effects of global food crisis

Chara Vavoura, *University of Athens*

Ioannis Vavouras, *Panteion University of Social and Political Sciences*

Οι ασύμμετρες κοινωνικο-οικονομικές επιπτώσεις της παγκόσμιας επισιτιστικής κρίσης

Χαρά Βαβούρα, *Πανεπιστήμιο της Αθήνας*

Ιωάννης Βαβούρας, *Πάντειο Πανεπιστήμιο Κοινωνικών και Πολιτικών Επιστημών*

ABSTRACT

The planet is experiencing a food crisis, the extent of which is unprecedented in the 21st century. The Covid-19 pandemic and the Russian invasion of Ukraine, combined with the extreme weather conditions of recent years, have been the most important determinants of this crisis. However, the food crisis has not affected all households and states equally but has been more severe for the economically vulnerable households and lower-income countries, where food takes up a large share of their consumption expenditure. The objective of this paper is to highlight the asymmetric and consequently redistributive socio-economic effects of the global food crisis.

KEY WORDS: Global Food Crisis, Harmonised Index of Consumer Prices, Income Inequality, War in Ukraine.

ΠΕΡΙΛΗΨΗ

Ο πλανήτης βιώνει μια επισιτιστική κρίση, παρόμοια με την οποία δεν είχε γνωρίσει κατά τον 21ο αιώνα. Η πανδημία του Covid-19 και η Ρωσική εισβολή στην Ουκρανία, σε συνδυασμό με τα ακραία καιρικά φαινόμενα των τελευταίων ετών, ήταν οι σημαντικότεροι προσδιοριστικοί παράγοντες αυτής της κρίσης. Η επισιτιστική όμως κρίση δεν επηρέασε ισόρροπα όλα τα νοικοκυριά και τα κράτη. Επηρέασε περισσότερο τα πιο οικονομικά ευάλωτα νοικοκυριά και τις χώρες χαμηλότερου εισοδήματος, που μεγάλο μέρος της καταναλωτικής τους δαπάνης αφορά είδη διατροφής. Σκοπός της παρούσας εργασίας είναι η ανάδειξη των ασύμμετρων και κατά συνέπεια αναδιανεμητικών κοινωνικοοικονομικών επιπτώσεων της παγκόσμιας επισιτιστικής κρίσης.

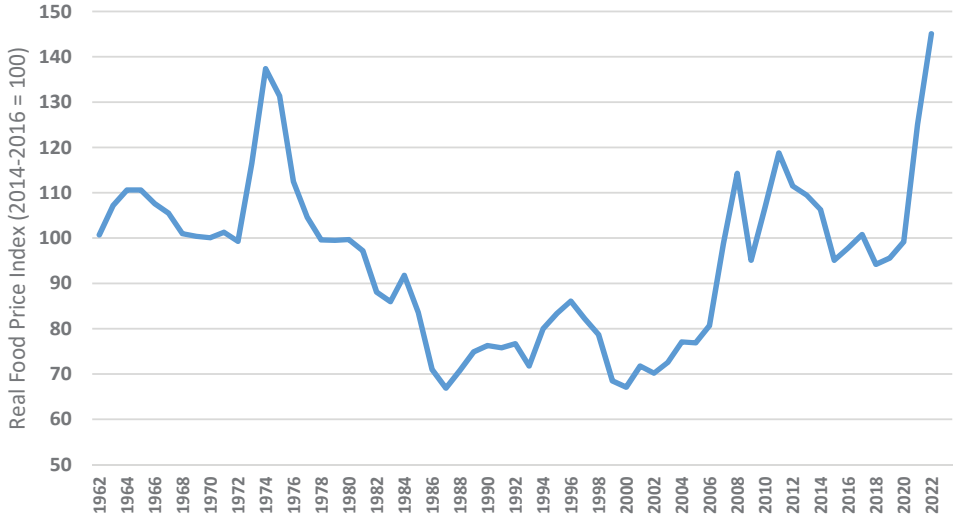
ΛΕΞΕΙΣ ΚΛΕΙΔΙΑ: Παγκόσμια Επισιτιστική Κρίση, Εναρμονισμένος Δείκτης Τιμών Καταναλωτή, Εισοδηματική Ανισότητα, Πόλεμος στην Ουκρανία.

1. Introduction

The world is experiencing the most serious food crisis in recent decades. Based on available data from the United Nations Food and Agriculture Organization (FAO) since the early 1960s, we realize that the current global food crisis has led to the highest real food prices on record. The situation is highlighted in Figure 1 where the evolution of the Real Food Price Index compiled by FAO is shown. The value of this index at the time of writing this paper for the year 2022 was 143.8. This value is much higher than all its previous highest values recorded in the past, namely the corresponding second highest peak of the year 1974 (137.4), as well as those of the years 2008 (114.3) and 2011 (118, 8). Figure 1 also shows that the problem of rising food prices worldwide did not appear only because of the Russian invasion of Ukraine on February 24, 2022. Already in 2021, a sharp rise in food prices had begun. The Real Food Price Index in 2021 compared to 2020 increased from 99.2 to 125.1. That is, it increased by 25.9 percentage points. In 2022 compared to 2021, according to the data available at the time of writing, it appears to have increased further to 143.8. It marked therefore an increase of 18.7 percentage points.

We observe that the effects of the Covid-19 pandemic on global food prices were also significant. More specifically, global food prices in 2021 increased mainly due to the uneven recovery of economies from the Covid-19 pandemic and the widespread supply chain disruptions due to the pandemic. To some extent, the extreme weather conditions that prevailed in 2021 in many regions of the world, which were the worst in recent decades and caused serious crop and livestock losses, also contributed to the food crisis (Global Network Against Food Crises, 2022). However, in general, since the beginning of the 2000s, there has been a trend of increasing real food prices worldwide. This upward trend seems to have been interrupted only temporarily. More specifically it stopped during the years 2009, 2015, 2016 and 2018.

Chart 1: *Evolution of the Annual Real FAO Food Price Index during the period 1961-2022: Base 2014-2016 = 100*



Data source: Food and Agriculture Organization of the United Nations (FAO), Food Price Index (fao.org/worldfoodsituation/foodpricesindex/en/). For the year 2022, release date: 07/10/2022.

The recent global food crisis is a large-scale one. As noted by the United Nations, humanity has not known a similar food crisis in the 21st century (UN, 2022). The lingering effects of the Covid-19 pandemic combined with the Russian-Ukrainian war and the generally observed climate change, which is now accepted as having transformed into a climate crisis, do not apply symmetrically to all individuals of each society and all countries of the world. In other words, the recent global food crisis has large redistributive effects on the lowest incomes, ultimately increasing the ranks of the global poor.

Of course, all food crises have some redistributive character, given that households and states that have limited possibilities to react to them are more vulnerable and suffer the greatest effects because of them. There are generally three main transmission mechanisms of this crisis, namely increases in food prices, increases in energy prices and a tightening of financing conditions in the context of a contractionary monetary policy that is typically implemented to counter inflationary pressures. The third mechanism is of particular importance in emerging markets and developing economies (EMDEs) according to the World Bank (World Bank, 2022). These three mechanisms working in parallel cause a vicious circle that renders it extremely difficult to get out of this crisis (UN, 2022). It is noted that the restrictions on food and fertilizer exports, which have been inflated since the start of the war, are already much stricter than those implemented during the food price crisis of 2007/8 (UN, 2022). According to the estimates of the United Nations, about 94 states with a total population of about 1.6 to 1.7 billion inhabitants are already seriously exposed to at least one of the above three mechanisms and are unable to respond to it (UN, 2022), while about 1, 2 billion people live in countries exposed to all three transmission mechanisms of the food crisis, which are called the "perfect storm" (UN, 2022).

The basic objective of this paper is to highlight the asymmetric economic and social effects of the current global food crisis. The highlighting of this problem will possibly contribute to the formation of economic and social policies suitable for dealing with it.

2. Real Income Levels and Consumption Standards

As income rises the total consumption expenditure of individuals or households increases. The higher the income is, the higher are the levels of consumption expenditure. For example, in Greece in the year 2020, according to Eurostat estimates, the mean consumption expenditure at purchasing power standards (PPS) per adult equivalent of the total population was 13,510. However, the mean consumption expenditure of the first quintile (the relatively poor) was 10,113 while that of the fifth quintile (the relatively rich) was 18,3150.

At the same time, as income rises, the composition of consumption changes. In other words, the so-called "consumption standards" are changing. The bulk of consumption expenditure shifts from basic or subsistence goods to more luxurious goods. This situation is reflected in the change in the weighting of the goods and services included in the calculation of the Consumer Price Index (CPI). These weights reflect the relative importance of goods and services in the budget of the average household. For this reason, these weightings are revised to the extent that noticeable changes in consumption patterns are observed.

In particular, as income increases, the share of food items in total consumption expenditure of individuals or households tends to decrease and consequently their weightings. For example, in Greece during the period 1959-2009 the weighting of food in the total consumption expenditure of households decreased from 43.75% to 17.12% according to ELSTAT (former ESYE)

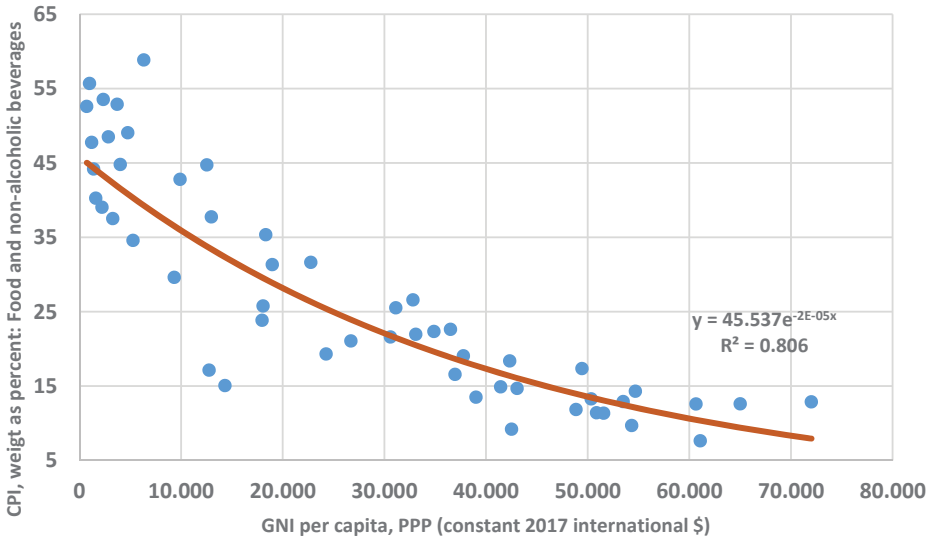
estimates. That is, in 2009 in Greece a typical household spent just 17% of its total consumption expenditure on food compared to 43.75% for the year 1959. At the same time, during the period 1960-2008 the average per capita Gross Domestic Product (GDP) in constant 2015 US dollars ($) increased from $5,030 to $23,929. In other words, we observe that increases in GDP per capita significantly affect the consumption patterns of households. One of the major effects of this increase is the relative reduction of expenditure on food in total consumption expenditure. This relationship is also confirmed in the following years. The reduction of GDP per capita in the post-2009 period in Greece resulted in an increase in the share of food in total consumer expenditure to 23.26% in 2021.

Therefore, if we want to investigate the evolution over time in the relative importance of food in total consumption expenditure in a country in relation to the changes of its average real GDP per capita, we could follow the adjustments of the weights of the corresponding CPI of that country. At the same time, if we want to compare the differences in the importance of food in total consumption expenditure between different countries in a given period of time, we could resort to comparisons of their respective CPI weights. The comparison of CPI weights is therefore a reliable indicator for investigating the effects of the relative importance of food in total consumption expenditure, both in a country over time and in international comparisons of these effects.

This analysis is attempted with the help of Chart 2, where we compare the consumption patterns of 52 countries of the world with different per capita incomes. More specifically we examine various high, middle and low per capita income countries. The countries of Chart 2 are ranked by their respective Gross National Income (GNI) per capita in the year 2021 in purchasing power parities (PPP) or international dollars (I$) to enable international comparisons of incomes based on their real purchasing power rather than their nominal monetary size. On the vertical axis of the chart, we depict the weight as percent of food and non-alcoholic beverages in the corresponding CPI of each country included in the sample.

From the Chart 2 we observe that the countries included in it and whose per capita income in 2021 was over I$60,000, the weight of food and non-alcoholic beverages in total consumption expenditure was well below 15%. In countries associated with a per capita income between 40,000 and 60,000 I$ the corresponding weight was well below 20%, while in countries with a per capita income below 10,000 I$ the corresponding weight was higher than 30% and in many of them higher than 50%. In other words, in many low-income countries, expenditure on food approaches or even exceeds 50% of the total consumption expenditure of households. Chart 2 depicts clearly the inverse relationship existing between the level of income and the share of food in total consumption expenditure of households.

Chart 2: *The relationship between GNI per capita and weight of food and non-alcoholic beverages in CPI*



Data sources: 1) International Monetary Fund (IMF), Consumer Price Index (CPI), Cross-country weights as percent, weight of food and non-alcoholic beverages. 2) World bank, World Development Indicators (WDI), Gross National Income (GNI) per capita, PPP (constant 2017 international $). Notes: 1) Data from the following 52 countries are included in the chart: Armenia, Australia, Austria, Bangladesh, Belarus, Belgium, Benin, Bhutan, Bulgaria, Burundi, Cambodia, Canada, Central African Republic, Chad, Chile, Colombia, Cyprus, Denmark, Dominican Republic, Estonia, Ethiopia, Finland, France, Germany, Greece, Haiti, Hungary, Iraq, Israel, Italy, Latvia, Mexico, Netherlands, New Zealand, Niger, Nigeria, Norway, Pakistan, Poland, Portugal, Rwanda, Serbia, Sierra Leone, Slovenia, South Africa, Spain, Sudan, Sweden, Switzerland, Ukraine, United Kingdom and United States. 2) Data on GNI and CPI weights refer to 2021 or to the most recent year available at the time of writing the paper.

3. The Distributional Effects of the Recent Global Food Crisis

According to the preceding analysis, the current global food crisis and the increase in food prices that necessarily accompanies it, does not affect all individuals and households in a society or all countries of the world in a symmetrical way, but, rather, it exerts unbalanced effects. This happens because it has a greater impact on the more economically vulnerable individuals and households that are net food consumers. In parallel, it affects lower income economies in which a very high proportion of consumer spending is on food items. We should note however at this point that those economically vulnerable individuals and households that are net food producers, i.e., they produce more food than they consume, could improve their welfare due to the global food crisis.

Although no evidence is yet available to systematically investigate the redistributive effects of the current global food crisis, there already exist empirical studies that have analyzed the re-

distributive effects of large increases in food prices in the previous periods. At the same time, in the context of the policy of economic development, the effects of the increases in the prices of food products have been the subject of empirical investigation in the past.

In principle, it could be argued that since about 75% of the world's poor population lives in rural areas where agriculture is their main economic activity, increases in food prices could raise their incomes. As a result, global food crises could improve the distribution of income in favor of these people and hence they could eradicate global poverty at least in the long term. This conclusion is reached by a number of researchers on the field, such as Headey, who find that increases in international food prices are associated with a decrease in national poverty rates in a large number of developing countries, which is mainly due to an increase in the demand for agricultural labor and increase in the supply of agricultural products, phenomena caused by the increases in international prices of agricultural products (Headey, 2018).

However, the opposite seems to be happening in reality. Reductions in the prices of agricultural products worsen the welfare of the rural population, given that most rural households are net food consumers rather than net food producers (Polaski, 2008). More specifically, a large part of the world's poor rural population does not produce enough food to meet its own consumption needs and is forced to supplement its income with income from dependent agricultural employment. This category of low-income individuals does not benefit from increases in food prices (Ravallion, 1990). It appears that increases in international prices of agricultural goods, when not coupled with labor productivity improvements, tend to increase poverty in developing countries or low-income economies rather than to reduce it (Ivanic and Martin, 2014). Only those individuals and households that have the necessary resources required to improve their productivity, such as for example adequate irrigated agricultural land, fertilizers and insecticides, can improve in fact their welfare when international food prices rise (Zezza et al., 2008).

Empirical research in the agricultural sector of various countries has shown that the gainers from world food price increases are the relatively wealthy individuals in the agricultural sector and the losers are the relatively poor (Ravallion, 1990). During the period 2007-2008, when there were large increases in food prices worldwide, the poorest households were hit hardest. This outcome resulted in increases in the "depth of poverty" or "poverty gap". The same problem manifested itself at the world regional level. The rural areas or regions of the world were most affected from the increases in world food prices during the above period (Compton et al., 2010).

According to the preceding analysis, the impact of food price increases due to the recent global food crisis are particularly significant in low-income economies that are net importers of food commodities. These countries are exposed to the phenomenon of the "perfect storm" to which we have already referred. That is, they are faced with all three transmission mechanisms of the global food crisis. Consequently, not all regions of the world are equally affected by the food crisis. For example, the region estimated to be most affected is Sub-Saharan Africa (UN, 2022). For the EU, supply chain disruptions due to the war in Ukraine and the impact of economic sanctions imposed on Russia by the international community is estimated that could push the European economy into a recession, while increases in food and energy prices are estimated to hit households, mainly the poorest ones, but not significantly (EIB, 2022). The effects will be of a greater importance in countries that are more sensitive to changes in energy and food prices and a relatively larger proportion of their population is at risk of poverty, i.e., in the countries of Central and South-Eastern Europe (EIB, 2022).

4. The War in Ukraine and the Food Crisis

The war in Ukraine has added another dimension to the already acute problem of the global food crisis. This war, as well as any war conflict in which countries of geostrategic importance and economic power are involved, has significant economic effects both at the regional (European) and at the global level. It has already affected global production, global employment, global financial flows and especially foreign direct investment, as well as world trade. Its effects are most severe in food and energy markets.

It must be noted that Russia and Ukraine account for a small percentage of world trade and world Gross Domestic Product (GDP). In 2021, the share of both countries in global merchandise trade was estimated to be 2.5%, while the share of both in global GDP was estimated to be only 1.9% (WTO, 2022). Moreover, in terms of exports of all commodities, Russia has a very low share on global commodity exports. According to the World Trade Organization (WTO), in 2021 Russia accounted for just 2.2% of global merchandise exports. In terms of merchandise imports, Russia has an even lower share. According to the WTO, in 2021 Russia held just 1.3% (WTO, 2021).

However, despite the limited participation of Russia and Ukraine in world trade, it should be clarified that in some commodities the two countries hold a very high percentage of world exports, such as wheat (25% in 2019), barley (15% in 2019) and sunflower oil (45% in 2019). Russia alone holds 9.4% of world trade in fuels, while in natural gas it holds 20% (WTO, 2022). At the same time, Ukraine alone accounts for 14% of global corn exports (Artuc et al., 2022).

After the Russian invasion of Ukraine, the global supply of the above goods was significantly disrupted, both because of the direct effects of the invasion, such as the blocking of Ukrainian grain exports through the Black Sea, and because of the international community's economic sanctions imposed on Russia. At the same time, we should not ignore the extreme weather phenomena that occurred in many parts of the planet, such as high temperatures in India, the USA and France, floods in China and drought in Africa. These problems combined with the increasing protectionism that prevailed in various countries due to the insecurity created in terms of securing the supply of food and raw materials, led to large increases in the prices of food products (McGuirk and Burke, 2022). That is, food price increases due to the Russian-Ukrainian war exacerbated the already existing global cost of living crisis that had also been worsened due to the Covid-19 pandemic.

The effects of war on individual countries are not symmetrical. Some countries are affected more and others less (Celi et al., 2022). This is determined by the degree of dependence or interdependence of the economy of each individual country on the economies of the countries involved in the conflict, but also by the extent of uncertainty and insecurity caused in each country by geopolitical tensions. In particular, the effects of the specific war on each economy basically depend on the extent of its dependence on imported energy, food and intermediate goods and raw materials from Russia and Ukraine, such as cereals (grain, corn, etc.), fertilizers, ores (palladium, nickel, aluminum, etc.), natural gas and oil. It should also be noted that the effects of the war in each individual country also depend on the percentage of its population that is at risk of poverty, given that the increases in food and energy prices affect more the most vulnerable households (EIB, 2022).

Focusing our analysis on the EU level where there is more reliable statistical evidence for international comparisons, it is confirmed that the recent food price developments exerted and continue to exert unbalanced effects on its individual member states. More specifically, by considering the monthly data - annual rate of change (percentage change on the same period of the

previous year), that is the twelve-month changes, of the Harmonised Indices of Consumer Prices (HICP) as they are estimated by the National Statistical Institutes (NSIs) and the Eurostat to measure consumer price inflation in the EU for international comparisons, we find the following as far as the food and non-alcoholic beverages inflation index (FHICP), code 01 of the international classification COICOP (Classification of Individual Consumption by Purpose) of the United Nations (UN) (Eurostat, 2022):

(a) Until August 2021, the European (27 member states) average annual rate of change of the FHICP was lower than 2%. From August 2021 till November2021 it reached the 2.9%. Until February 2022 it reached the 5.5% (It is noted that on February 24, the Russian invasion of Ukraine began). In March 2022 it increased to 6.7%, while in April 2022 it reached the 8.6%. The increases of the FHICP continued during the following months. In August 2022, the average European FHICP index had risen to 14%. So, it is concluded that in the EU food prices started to rise before the Russian invasion of Ukraine, as a result of the bottlenecks caused by the Covid-19 pandemic. The Russian invasion accelerated their increase rates.

(b) Although in August 2022 the average European FHICP index was 14.0%, very large differences in FHICP rates are observed between the individual member states. In some member states the FHICP rate was close to 20%, namely in Bulgaria (24.1%), Czechia (19.9%), Estonia (21.8%) Romania (19.1%) and Slovakia (21.0%), while in some others it was higher than 25%, namely in Latvia (25.9%), Lithuania (29.8%) and Hungary (33.1%). At the same time, in some member states the corresponding FHICP was lower than 10%, namely in Ireland (8.7%), France (8.4%), Cyprus (5.0%) and Luxembourg (8.1%). We are therefore observing the large asymmetric effects of the global food crisis on food prices in the individual EU member states. These unbalanced or asymmetric effects of food price inflation on individual countries reveal the extent of their structural differences. Moreover, they highlight once again the problem that the EU is not an "optimum currency area" and make it extremely difficult to design and implement a single long-term European strategy against the global food crisis.

5. Conclusion

The global food crisis, that got worse after the Russian invasion of Ukraine, does not have a balanced impact on all households and all countries of the planet. It has a strong redistributive character. It affects more seriously people and countries that have limited capacity to respond to it. This responsiveness to a large extent depends on income. People with low disposable income who are net consumers of food products and countries with low real per capita disposable income in which a high proportion of consumer spending is on food products tend to be hardest hit by the crisis. Based on existing experience we know that the global food crisis also affects the majority of rural households, who are net consumers of food products and not pure producers. Only those rural households that can access the necessary financial resources to raise their productivity levels can improve their welfare as a result of the food crisis.

The Russian invasion to Ukraine added another dimension to the problem of global food crisis. The food price increases it caused were largely unbalanced. The extent of its effects was determined by the degree of dependence or interdependence of the economy of each individual country on the economies of the countries involved in the conflict (Russia and Ukraine), but also by the extent of uncertainty and insecurity caused in each country by the geopolitical tensions that emerged. As for the EU as a whole, given the structural differences between its member states, it is extremely difficult to formulate a common strategy to respond to the global food crisis.

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Biographical Notes

Chara Vavoura is Postdoctoral Researcher of Economics at the Department of Economics, University of Athens. She studied Economics at the Athens University of Economics and Business, the University of Oxford and the University of Nottingham. (Corresponding author: Chara Vavoura, National and Kapodistrian University of Athens, Gripario Megaro, Sofokleous 1 & Aristidou 11, Athens, 10559. e-mail: cvavoura@econ.uoa.gr).

Ioannis Vavouras is Professor Emeritus of Economic Policy at Panteion University of Social and Political Sciences. He was elected three times as Head of the Department of Public Administration of Panteion University and two times as Rector of Panteion University. He has about 160 scientific publications [24 books (2 of them in English), 114 journal articles, volume chapters and discussion papers (53 of them in English) and 21 articles in Greek periodicals]. Finally, he has more than 50 contributions in conferences, seminars and graduate programs.