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Hesiod on Scarcity

By Gregory T. Papanikos^{*}

This study deals with Hesiod's most important economic contribution. He introduced and explicitly defined the concept of economic scarcity, relating it to the productivity of labor. The latter can be enhanced by an unbounded Prometheus (technology), which permits the exploitation of new materials such as iron. In this paper, a distinction is made between a static and a dynamic definition of scarcity. Related to scarcity is the debate on the etymology of the word "economics". In Works and Days, the word itself is absent, but, nevertheless, the word "oikos" is mentioned many times to clearly mean family business, which needs economic management within the institutionally-determined peace and justice. Without these two pre-conditions, the economies cannot flourish (grow).

Keywords: Scarcity, Hesiod, Ancient Economy, economic growth, justice, peace, productivity of labor

Introduction

Scarcity is defined as the lack of means of life. The opposite is abundance, i.e., more goods exist than needed. Hesiod understood the importance of scarcity in determining human behavior, clearly defined it and provided an excellent and unsurpassed metaphysical explanation of its existence, which, nevertheless, included a pragmatic way of mitigating its intensity. All of these are examined in this paper. Hesiod's discussion of the scarcity issue may be considered as his most important economic contribution. Papanikos (2022a) examines Hesiod's overall place in the economics literature. Scarcity is one of his important contributions that puts him at the beginning of the history of economic thought and economic analysis. Hesiod's clear definition of scarcity and its relationship to economic activities makes him the first known economist in the world.

Scarcity is, by definition, the economic problem of humanity. Hesiod not only provides, what I call, a static definition of scarcity, which most contemporary economists would feel comfortable with, but he also gives a dynamic definition of scarcity, which encompasses a continuum of the intensity of scarcity, which is demonstrated by three distinct categories: deprivation (famine, starvation), saturation (bliss point), and abundance. This dynamic approach entails comparisons across time of the same household, and most importantly comparisons between households across space and time.

All three of these possible categorical human conditions are analyzed in *Works and Days*, which includes both normative and ontological effects that these conditions have on the allocation of time in work activities, leisure time and

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idleness (laziness). Papanikos (2022b) presents, in detail, Hesiod's book, *Works and Days*, arguing that it is the first known economics textbook. At the individual level, Hesiod states that the scarcity problem can be solved by four means. Firstly, by stealing other people's products, i.e., those who sleep during the day so they can "work" during the night. Secondly, extort other people's property and goods by bribing the kings-judges or by lying and borrowing money/goods, which are never returned back. Thirdly, by begging. Fourthly, by working honestly and hard to produce what is needed. According to Hesiod, the last is the best solution in the long-run to the scarcity problem.

Thus, the scarcity problem can be solved when individuals become saturated (the exact word used by Hesiod is *κορεσάμενος*¹), and even better when their accumulated wealth is abundant, i.e., their warehouse is full of material goods. Further accumulation of wealth, beyond saturation, might be the result of either the subjective utility of wealth and/or as a result of the demonstration effect when an individual compares himself with others, such as neighbors, relatives and people of the same profession. Hesiod also has a theory of unhappiness because of the diminishing marginal utility of income (consumption), which can turn negative after the bliss point is reached.

In addition to his pragmatic analysis of the scarcity problem at the level of the individual, Hesiod's metaphysical explanation (Prometheus' fable and Pandora's jar) of the existence of scarcity also suggests that, at the level of humanity, the intensity of scarcity can be mitigated by applying technology (fire) to produce more goods and services and to discover new materials (iron²). Technology and new discoveries give hope. It is what is left inside Pandora's jar for the humanity to use in order to alleviate the intensity of the scarcity problem.

Hesiod has so far been vindicated. The history of the human race is the struggle against scarcity—ethical and unethical or legally and illegally. One can paraphrase Karl Marx and state that the history of all hitherto existing societies is the history of struggles against the intensity of scarcity. The class struggle is only one manifestation of these struggles and relates more to the distribution of the intensity of the scarcity rather than its overall mitigation. At the world level, the struggle against scarcity continues, especially as this is manifested by absolute poverty, malnutrition and the dire condition of the everyday living of billions of people. This is despite Prometheus being unbounded now. Unfortunately for billions of people, Prometheus has been unable to solve the deprivation manifestation of the intensity of the scarcity problem. Hunger, famine, starvation, child malnourishment and diseases still exist, or as Hesiod put it:³

¹The same word is used in modern Greek economic terminology to indicate "saturation", i.e., *κορεσμός*.

²Hesiod, in his economic history (Papanikos, 2022c), uses metals to identify the various historical phases of human development such as gold, silver, copper and iron. Hesiod lives in the iron race (age, epoch, period). However, even in this purely economic explanation of human development he adds something mythical-metaphysical, which is the race of heroes, i.e., those who fought in the battles of Troy and Thebes. My interpretation is that this insertion made his book more attractive to his listeners.

³Unless specified otherwise, I provide the English translation of the original text. By doing so I chose from the many meanings that a word has, the one which makes sense to modern day

but myriad other catastrophes for the people
untold

ἄλλα δὲ μυρία λυγρὰ κατ' ἀνθρώπους ἀλάληται
[100]

The moral of the story is that the war of the human race against Gods (searching for the truth and creating new knowledge) continues! After all, Prometheus was the first to challenge the Gods' power to hide the truth and look at them straight in the eyes (and minds) as equals. Since then, the human race is able to theorize and find out, through the acquisition of new knowledge, solutions to the myriad of human problems. Literally speaking, the word "theory" means, "I see God" and therefore I know what is known by God. Building theories, then, is like building ladders to reach Gods, i.e., to acquire new and useful knowledge.

Singer (1958) was the first to notice Hesiod's important and unique economic contribution to the scarcity issue. Gordon (1963) further developed Hesiod's exceptional scarcity idea by comparing Hesiod and Aristotle. As is the case with Homer, Aristotle has received much greater attention by contemporary economists even though, unlike Hesiod, he was not an economist. Gordon (1963) correctly pointed out that Hesiod was the first to define and analyze the scarcity issue as an economic problem. Aristotle did not. Unfortunately, Singer's and Gordon's papers have not motivated economists to change their views on the origins of the scarcity issue. Almost all economists consider Robbins (1932) as having invented the idea of scarcity. In this paper, Hesiod is considered as the genuine Prometheus while Robbins a pseudo-Prometheus. This predatory practice has happened many times in the history of scientific innovations.

In this paper, I argue that Hesiod's concept of scarcity is not only his most important contribution to economic analysis, but it is much better than Robbins's contribution, i.e., he explains more than Robbins's definition of scarcity. At least this is my reading. Hesiod clearly recognizes, as many economists do today, that people must "economize" because the means of life are scarce. Unlike contemporary economists who ignore the question, "why does scarcity exist?",⁴ Hesiod gives his own metaphysical explanation; not only of its existence, but also of its intensity. The myth of Prometheus is a heuristic way of saying that the scarcity problem may be mitigated by technology and new discoveries.

Scarcity is not the same for all people living in different times and places. Hesiod's metaphysical story can be used to interpret his concept of scarcity as a dynamic one which relates the long historical trend of the scarce means of life to productivity of labor (technology) and to the satisfaction of an ever-growing number of human needs, taking into consideration the declining marginal utility of consumption. Therefore, there exists a point of saturation (*κορεσάμενος*), or as economists call it, a "bliss point". Hesiod had developed an explicit theory of

economists. Unfortunately for the economic interpretation of Hesiod's work, classicists and philologists translate the text having in mind other criteria.

⁴Robbins (1932, p. 15) does make a note that, "We have been turned out of Paradise. We have neither eternal life nor unlimited means of gratification". This of course cannot compare with the Hesiod's Prometheus fable and Pandora's jar and the non-metaphysical hope this entails for future human races to mitigate the intensiveness of the scarcity problem as explained below in this paper.

diminishing marginal utility of income and wealth and applied it to the economic problem of scarcity.

Undoubtedly, the study of economics is the study of scarcity. Even the distributional aspects of economic analysis, which mainstream economists ignore, depend upon scarcity. On the other hand, the so-called radical economists failed to recognize that the greatest achievement of the contemporary economic system (or human race, to use Hesiod's term) has been its continuous ability to substantially mitigate the intensity of the scarcity problem. Hesiod wishes for such a world when he stated that he wanted to live in the future because better things can happen (along with bad of course). It seems that from the scarcity point of view, if Hesiod lived today, he would conclude that many good things have happened along with many bad; as is always the case, I may add.

Robbins (1932, p. 15), in an excellent paragraph, describes the role of scarcity in defining the subject matter of economics. I give here the full passage because it has many similarities to Hesiod's concept of scarcity:

Here, then, is the unity of subject of Economic Science, the forms assumed by human behaviour in disposing of scarce means. The examples we have discussed already harmonise perfectly with this conception. Both the services of cooks and the services of opera dancers are limited in relation to demand and can be put to alternative uses. The Theory of Wages in its entirety is covered by our present definition. So, too, is the Political Economy of War. The waging of war necessarily involves the withdrawal of scarce goods and services from other uses if it is to be satisfactorily achieved. It has therefore an economic aspect. The economist studies the disposal of scarce means. He is interested in the way different degrees of scarcity of different goods give rise to different ratios of valuation between them, and he is interested in the way in which changes in conditions of scarcity, whether coming from changes in ends or changes in means—from the demand side or the supply side—affect these ratios. Economics is the science which studies human behavior as a relationship between ends and scarce means which have alternative uses.

Economic textbooks cite the last sentence as the definition of economics. Economics is not what economists do, **but the analysis of what people are forced to do when they are compelled by the scarce means of living.** I have chosen the word "force" because in many cases people, out of desperation and caused by the scarcity of the means of life, do things which go beyond what a civilized society would consider ethically and legally acceptable. At the individual level, this takes the form of theft and crime and other unethical behaviors, but at the polity (social) level it takes the form of wars (plundering) and injustice. Hesiod analyzes them extensively, but rejects all these alternative ways of solving the scarcity problem. He bases his arguments on ethical and realistic (historical) grounds as I shall show below in this paper.

Robbins is wrong in the above quotation when he stated that the war reduces the scarce resources from other uses. This is a static and short-run analysis. It does not take into consideration the distributional effects of a war. A dynamic historical analysis will show that staging a successful war increases the scarce resources available to be used for non-war purposes by the winner. The present value of a successful war far exceeds the present value of costs, including the initial costs of

preparing for a war. A war (the use or the threat of violence) is one of many methods to acquire scarce means of life and has nothing to do with its many other excuses in staging a war, such as the clash of civilizations or for the beauty of Helen in Homer's story of the Trojan War. If Troy was not where it is and the whole area was not providing the scarce means of living to the Greek city-states, I doubt very much if Greeks would have cared if Helen fell in love with someone from Troy and left her husband in mainland Greece.⁵ In a nutshell, and contrary to Robbins' allegations in the above quote, after the successful war in Troy, the Greeks had much more means of life than before the war. Their war expedition had risks as all "investments" do. It is true that the Trojans lost not only their means of living but their lives as well. This is a distributional problem of scarce resources and economists like Robbins and many others like him ignore this fundamental economic solution to the scarcity problem. On the other hand, Hesiod did not ignore it.

My conclusion from reading history⁶ is that the entire ancient history of wars (almost two millennia) for which we have written information from the Trojan War up to the collapse of the Roman Empire, a long-lasting war is always a continuous struggle to acquire scarce means of life; they are wars against scarcity. Classical Athens of the fifth century BCE is the best-known case along with many other examples.⁷ At the cost of overstating it, one may argue that the history of scarcity is the history of wars to "steal" scarce resources, primarily food and natural resources from other countries and people. The scarce resources (money) that poured into Athens after the successful battles against the Persian Empire in the early fifth century BCE were unprecedented. It created an Athenian empire, which by the continuous use of wars, attempted: (a) to mitigate the intensity of the starvation problem of the very poor Athenians by securing the importation of cheap food (grains) from all over the known world at the time; (b) to satisfy the cravenness for wealth of many individual Athenian citizens; and (c) to show off their wealth by building such masterpieces as the monuments on the Acropolis Hill.⁸ This is exactly what Hesiod had predicted a few centuries before in his *Works and Days* and so eloquently have been told by the two great historians of the world: Thucydides and Xenophon. Robbins lived in a period when people knew and studied the ancient Greek sources (classical studies). It seems that he did not read it, or if he had read it, he did not appreciate the important implications of

⁵Gorgias (5th-4th Century BCE), in his masterpiece of *Encomium of Helen*, gives four reasons (God's will, use of force, love, and logos-soothing) why Helen was the innocent part of the Trojan War. Of course, Herodotus (5th Century BCE) also gives an excellent catalogue of the women who were allegedly the causes of wars (including Helen), but right away dismisses such an approach. Herodotus was writing history and not novels.

⁶In other works, I examined what history is as well as its other aspects, including how history can be used to assist in the implementation of economic policy; see Papanikos (2020a, 2006, 2005) and Papanikos and Pappas (2006).

⁷The most famous one is of course the *Peloponnesian War*, which has so masterfully been narrated by Thucydides in his 5th Century BCE book, including an excellent presentation of the pandemic which hit Athenians in the first year of the war; see Papanikos (2020b).

⁸This includes the temple of Parthenon with an unmatched economic cost. The cost was close to 500 silver talents which was equivalent to half of the annual revenue of the Athenian state. In today's Greece, the cost would have been at least 20 billion euro.

Hesiod's economic contributions. It seems that many contemporary scientists have started to look again at ancient (economic) history for inspiration, and most importantly to avoid not only the "Thucydides Trap", but also to take into consideration the Ancient Greek proverb: a wise man does not make the same mistake twice (*το δις ἐξαμαρτεῖν οὐκ ἀνδρὸς σοφοῦ ἐστὶ*), which allegedly was said by Meandrous.

The notion of scarcity is tautological to the concept of the economy. Without scarcity, the study of economics is useless. Without scarcity there is no need to economize; *φειδῶ* is one of the verbs Hesiod uses which can be translated as being frugal, or as the fourth century BCE Greek scholars would call it, "do economy" or economize. This term has survived to the Modern Greek language, and if someone is good at being frugal, it is called, *οικονόμος*. This relates to the history of the adoption of the word "economics" by later writers. However, as Hesiod points out, the scarcity problem cannot be solved by frugality alone. The human race is "condemned" to work hard because of the threat of scarcity.

The above is an overview of Hesiod's contribution to scarcity and therefore to economic analysis. All the above issues are examined in this paper. The paper is organized into six sections, including this relatively long introduction. Section two discusses the static definition of scarcity, which appears in the contemporary economics textbook. Section three presents Hesiod's unparallel explanation of scarcity, which I call a dynamic definition of scarcity. Section four gives Hesiod's metaphysical explanation of why scarcity exists and how using technology can mitigate the intensity of scarcity. Section five discusses the issue of the concept of "economy", "economics" and "economize" in Hesiod's *Works and Days*. The final section concludes.

The Static Definition of Scarcity

Economics is the study of human behavior when they are faced with the harsh reality of material scarcity. Robbins is credited with giving the best definition of economics. It is based on his meaning of scarcity as was shown in the introduction above. The received view of his analysis of the meaning of scarcity in his well-known book, *An Essay on the Nature & Significance of Economic Science*, Robbins (1932, p. 15) stated that, "Scarcity of means to satisfy given ends is an almost ubiquitous condition of human behavior."

Just to note that the use of the word "almost" leaves room for exceptions because there are some human ends which cannot be satisfied by any allocation of scarce means alone. For example, one cannot buy God's love with scarce means (money), even though some religions have promised God's love if the worshipers donate (pay money) or even sacrifice their lives. Equivalently, you cannot buy someone's true love, including the love of your family members, using scarce resources alone or even by sacrificing your life. You may be able to "buy" their pity, but not their love. Also, you may buy people's pretense of loving you, and for many "consumers of love", this might be sufficient. Finally, and most important of all, one cannot always buy good health, and sooner or later the fate of any

individual, rich or poor, has been predetermined by their own birth. Humans are mortals and this is independent of their wealth. In 2017, the last human being born in the nineteenth-century died. Now it is the turn of the twentieth-century human race to start departing from earth! Hesiod emphasizes this throughout his work. This fatality of the human race underlies all his theory of economic history discussed in Papanikos (2022c). One may distinguish then, between material and non-material scarcity. It is only the material aspect of scarcity, which is the subject of economic analysis.

I call the above description of scarcity the static definition. The problem of scarcity becomes a mechanical dilemma which can be easily solved by linear programming. Every household can make its daily, monthly, annual and lifetime planning by allocating its past, current and future accumulation of scarce resources (income) to meet the infinite ends (consumption). Hesiod gives a full daily, monthly and annual calendar of all the activities necessary to create the means of life to satisfy human needs. This is the necessary, but a mechanical and a relatively easy solution to the scarcity problem. Nonetheless, I consider this static definition as a necessary starting point, but not sufficient to define the meaning of scarcity and therefore the totality of the subject matter of economics.

The static definition unnecessarily and unjustifiably restricts the rich field of economics because some economists have been infected by what I call a “monomaniac ideological framework”. This disease has penetrated their “heart and soul” as Hesiod would have put it. There are many economists who suffer from “a phobia of distribution”. They do not want to consider any economic analysis which touches upon the distribution of income and wealth, or what is similar, the interpersonal comparisons of utilities at the level of individuals, social classes and countries. Robbins went to great lengths in explaining why his definition of scarcity and the obvious fact of the diminishing marginal utility of income (wealth) should not be related to its distribution. Even though he relates scarcity to the law of declining marginal utility, Robbins, nevertheless, unsuccessfully attempted to refute the distributional implication of the law.

Hick’s contribution in the 1930s called the ordinals “revolution”, “liberated” economists from the need to analyze demand along the lines of declining marginal utility. My feeling is that he did not liberate them from their phobia of distribution. Robbins’ publication of 1932 missed this “revolution”. However, Hicks did not give a parsimonious answer to the same question, but restricted the domain of the question to be answered.⁹ The difference is on the distribution of scarce means to satisfy the infinite ends. The Hicksean analysis of indifference curves cannot answer the following question: should economics examine whether society’s welfare can increase if there is a way that income and wealth can be redistributed from rich to poor households without, however, reducing the total quantity of goods and services produced either today or in the future?¹⁰ Is this an entirely

⁹Cooter and Rappoport (1984) provided an excellent overview of the difference between ordinalists and cardinalists.

¹⁰Hicks is credited as having invented the compensation principle, i.e., those who lose have the potential to be compensated by those who gain and are still left better off. This is a perfect (happy) society where the scarcity problem is solved with perfect harmony. It is like the perfect competition

different issue not to be examined by economists? Some economists have responded that the issue of diminishing marginal utility of income (wealth) should not only be used for welfare (distributional) analysis, but it should be used to analyze individual human behavior of nonlinearities between wealth and “happiness”. In other words, we are living in a world that some individuals have accumulated so many scarce resources that one additional unit makes them unhappy. A social (public) intervention to prevent such a conspicuous “market failure” of consumption will make these people happier. Of course, such an unhappy individual may, on their own, act in order to get rid of this excess “fat”. Philanthropic actions are a characteristic example. It is not an accident that the super-rich of this planet have established their own philanthropic associations to help solve the scarcity problem of the world. Of course, economists are absolutely correct when they point out that vanity is an element of the utility function and this is satisfied when such associations bear the name of their founders, usually along with their wives/husbands.

The relatively new field of the economics of happiness demonstrates that there is a point where more income (consumption) makes people unhappy. This literature links utility, income and happiness to the idea of the relative income hypothesis which according to Clark et al. (2008, p. 100), “... can be dated back to at least Thorstein Veblen (1899), and then James S. Duesenberry (1949).”

The authors smartly mentioned “at least” which allows me to argue that Hesiod was the first to point this out. As stated in the abstract of their paper, “Income may be evaluated relative to others (social comparison) or to oneself in the past (habituation).” This is exactly what Hesiod’s analysis does.

Relative comparisons bring the issue to the surface that Robbins and others have tried very hard to avoid: the intensity of scarcity is not the same for all individuals. In other words, it is one thing to allocate scarce means to satisfy infinite ends, but it is another thing to explain why the intensity of scarcity differs between individuals across space (geographically) and time (historically). Hesiod tackled this issue and gave some very interesting answers. His conceptualization of scarcity can be considered as being part of a dynamic explanation, which is examined in the following section.

The Dynamic Definition of Scarcity

Hesiod offers what I call a dynamic definition of scarcity. According to Hesiod, scarcity is the difference between what people want (ends) and what people have (means). As already mentioned, this defines three mutually exclusive states of human condition: (a) abundance, (b) saturation, and (c) deprivation – famine. These three words appear many times in Hesiod’s *Works and Days*.

I have already mentioned that Hesiod uses the word *κορεσάμενος* to describe the state of material saturation. Another word is *ἄρκιος*, which is translated as

or the perfect (ideal) society of Plato. Their common characteristic of all these perfections is that they do not exist. Nevertheless, they have a tremendous value as yardsticks to be used to evaluate real world situations.

sufficient or satisfactory. Hesiod uses this term to draw the demarcation line between work and leisure. Spend time on leisure once you have secured sufficient means of life would be the recommendation of Hesiod and not otherwise. The best word which describes the deprivation is λιμός, which is translated as “famine” in English; the same word is used in Modern Greek.

As for the word “abundance”, there are many words which can identify a state of abundance. I have counted more than ten words in *Works and Days*. Some are mentioned many times in different parts of the text. At this state, people can derive pleasure from the simple accumulation of wealth, by giving to others or by entering into conspicuous consumption, of which Hesiod is not in favor; moderation and not demonstration is what he suggests. It should always be kept in mind that Hesiod, like Adam Smith, was on a mission: to make the world materially and ethically better.

These three human conditions can be objectively or subjectively defined. They differ from individual to individual. Abundance is defined when the ends are less than the means. In this case, people are wealthy (rich) with a lot of property and plenty of leisure time. Saturation is a state of human condition when the means of life suffice to satisfy all the ends (needs), including the need for leisure time. Deprivation is a state of affairs where individuals and their families starve and the means of life are not sufficient to cover their basic (biological) needs.

The extent of this difference between ends and means measures the intensity of scarcity, which is determined by a number of factors including:

- (a) the individual time devoted to work and not to leisure/laziness;
- (b) the previously accumulated wealth;
- (c) the stability secured by peace and justice; and
- (d) the uncertainty of life.

The latter Hesiod attributes to Gods because they are the ones who determine the “natural” phenomena, which affect the production and productivity of work, particularly in farming and seafaring. Thus, Hesiod does not blame only the individual as being responsible for his being destitute, but gives two other reasons attributing them to archons and Gods. Not hard work, but luck as well to be born in a good society without wars and injustices as well as Gods’ blessings determines the intensity of scarcity. This issue relates very much to the recent discussion of political philosophy instigated primarily by the work of Sandel (2020), which considers that meritocracy is not so much the result of individual hard work, but the result of chance, which includes whether one was born into a rich or a poor family; in an advanced or less advanced politeia; raised during a war or peace period.

Hesiod suggests that the problem of scarcity must be solved only by hard and honest work with the spirit of fair competition between the various trades and artisans. Any current surplus should become accumulated property so that the future scarcity problem becomes less acute, i.e., the intensity of the scarcity is reduced by decreasing the ratio of ends to scarce means. Hesiod warns that cities cannot progress economically (do not produce more goods) and are in general

non-sustainable in the very long term, if they attempt to solve their present scarcity problem by wars, plunder, theft and injustice. Sustainability is also included in the existence of the human race itself. The threat of extinguishing humanity is an integral part of Hesiod's theory of economic history either by Gods' will or by self-destruction because of wars. The idea that the human race has created the means of its own destruction is as evident in Hesiod's works as it is today with the atomic bomb and climate change.

As already mentioned above, there were many states and races which relied on wars to solve their scarcity problem. As predicted by Hesiod, they disappeared from the face of the earth. Of course, there are many other civilizations (human races) which were able to survive, but they had to adjust to a fairer distribution of the means of life. This is the case with all western powers. Now they must share some of their power with the rest of the world if they want to avoid what was aptly called the "Thucydides Trap".

Hesiod discusses all three mutually exclusive human conditions mentioned above as I shall show below. Unlike Robbins' received view on scarcity, the dynamic concept of scarcity--defined as the difference between ends and means--was used by Hesiod to show: (a) the hard objective condition individuals face when the available means of life do not suffice to cover their basic needs (avoid starvation); (b) the need to accumulate any current surplus to avoid future deprivation of the basic means of life which may result in famine in addition to additional satisfaction people derive by accumulating wealth, or as Hesiod so wonderfully put it: if your soul or heart craves for more wealth; and (c) the subjective feeling of deprivation people experience when their social reference group (neighbors, relatives, economic and social class etc.) has higher means and therefore is able to satisfy more ends.

Points (b) and (c) are the dynamic elements of Hesiod's definition of scarcity, which are lacking from Robbins' definition of scarcity. A part of this dynamic definition of scarcity has been vindicated by the development of the relative income hypothesis and the demonstrative effect of consumption; see Arrow and Dasgupta (2009). However, the most important element of Hesiod's dynamic definition of scarcity is its relation to production (work time) and productivity of labor. The latter is related to technology (use of fire) and new discoveries (iron). Both issues are examined in the following two sections of this paper.

Work, Production, Productivity, Leisure and Laziness

Hesiod's concept of scarcity is related to the uncertainty (Gods' will) of life, but primarily to time allocated to work. It is work that increases production and adds to the accumulation of private wealth. In today's economic jargon, Hesiod suggests that people should maximize their income (wealth) from working hard, subject to the uncertainties of life. Hesiod is very clear on the allocation of individual time between work, leisure and laziness.

Scarcity and the Productivity of Labor

As I have mentioned above, the description of the three human conditions of severe scarcity (famine), saturation and abundance are everywhere in Hesiod's *Works and Days*, but the best excerpt which clearly defines scarcity is the one that related it to the productivity of labor. Hesiod defined scarcity (actually, the lack of scarcity) as follows:

Because easily by working one day
have for a year and idle be

ῥηιδίως γάρ κεν καὶ ἐπ' ἡματι ἐργάσσαιο,
ὥστε σε κείς ἐνιαυτὸν ἔχειν καὶ ἀεργὸν
έόντα [43-44]

Scarcity exists because the productivity of labor is not sufficient to produce what people need. In the above example, Hesiod's extremely high productivity of labor required only one day's work to satisfy all annual needs. This is the essence of scarcity according to Hesiod, i.e., the relatively low productivity of work. Robbins correctly points out that scarcity is a relative concept, but Hesiod shows why this is the case by integrating it into his definition of scarcity. At the limit, scarcity will stop to exist or will become less acute¹¹ when the productivity of labor will tend to infinity, i.e., people will not need to work, and they will be idle, or as Hesiod put it in the above passage, *καὶ ἀεργὸν έόντα*. The word *ἀεργὸν* means that there is no need to work to produce anything because everything will come almost for free like Hesiod's Golden Age as is further explained in Papanikos (2022c).

In the above excerpt, Hesiod does not blame only the individual for the existence of scarcity, but the low productivity. The low productivity is the result of the lack of technology as Hesiod explained in his metaphysical interpretation of the existence of scarcity, which is discussed in the next section of this paper. There existed an initial stage of human development in which people did not work because earth provided all they needed for free. This metaphysical explanation of the existence of scarcity leaves the door open for an optimistic outlook of the dynamic historical evolution of the intensity of the scarcity problem. Hesiod was optimistic about the future despite the hardships of his contemporary iron race. He writes:

Now the iron race exists; never a day
without work-tiredness and pain, not a non-
tormented night;
hard Gods give concerns;
but, however, mixed are the goods with bad.

νῦν γὰρ δὴ γένος ἐστὶ σιδήρεον• οὐδέ ποτ' ἡμαρ
παύονται καμάτων καὶ οἰζύος, οὐδέ τι νύκτωρ
φθειρόμενοι.
χαλεπὰς δὲ θεοὶ δώσουσι μερίμνας·
ἀλλ' ἔμπηξ καὶ τοῖσι μεμείξεται ἐσθλὰ κακοῖσιν.
[176-179]

¹¹I do not know any economist who will not consider starvation (famine) as an acute manifestation of the scarcity problem. They disagree on the proposed solutions. Some argue that it is a matter of the world distribution of food because the total production of food is sufficient to feed more than the entire world population and avoid episodes of famine and malnutrition. Some other economists argue that such distribution will result in less food for the future and therefore the famine problem cannot be solved by distribution alone. The best long-term solution is to increase production in the areas of the world which suffer from the acute manifestation of the scarcity problem by increasing the productivity of labor. I think on the latter solution, no economist would disagree.

The word *καμάτου* has survived into Modern Greek and means “tired from work”, which is another indication of how scarcity can be overcome, i.e., with hard work and pain. In Modern Greek, the two Hesiodic words of *ἥμαρ* and *καμάτου* have survived as one word: *μεροκάματο*, which means “the daily wage rate”. Hesiod believed that he lives in the Iron Age, mixed with good and bad. However, it is up to human beings to exploit the goods and avoid the bad. His optimism is expressed in the two preceding lines of the above passage when Hesiod wished that he was born after the Iron Age because it will be better than the current state of human economic affairs.

Hesiod developed another interesting theory about the productivity of labor. People should start their work as early as possible, at dawn, because it is during the dawn that one can do most of a day’s work. Hesiod put it much better as follows:

Because the dawn’s work provides one third of the day	ἥως γὰρ ἔργοιο τρίτην ἀπομείρεται αἶσαν,
The dawn moves you on the road, and moves you on the work	ἥως τοι προφέρει μὲν ὁδοῦ, προφέρει δὲ καὶ ἔργου [578-579]

The words used by Hesiod reveal the economic depth of his thought. The word *ἀπομείρεται*, translated here as “provide”, also means to distribute the production of what is destined (*αἶσαν*) to be produced in one day. This way, nature and metaphysics intermingle again. What one can produce in one day because of the uncertainty of life, especially in agriculture and seafaring, is a destiny determined by Gods, but taken this as given, human beings can get a bigger share of what is destined to them only if they start working early in the morning. This is a testable hypothesis whether the productivity of labor is higher early in the morning (at dawn) relative to the rest of the day. Actually, Hesiod’s theory of the daily productivity of labor makes it one-third which is an empirical testable hypothesis; one of many that exist in his book of *Works and Days*. One may wonder how Hesiod came up with this number, one of the few which are cited in his book. Of course, his own experience provided the evidence for such claims.

Attitudes towards Work, Leisure and Laziness

Gods play only a partial role in what a man can produce on a daily, monthly and annual basis. The rest is determined by an individual’s attitude towards work, leisure and laziness. Hesiod develops a theory which relates scarcity to an individual’s own choices in allocating the scarce time among the three alternatives: work, leisure and laziness. He distinguishes the non-work time between laziness and enjoyment (leisure). He was against laziness, especially if people are faced with the severe manifestation of the scarcity problem as is demonstrated by starvation and famine. In this case, only hard and long work can solve the scarcity problem and avoid famine.

The important dynamic element of scarcity is the relation between works and ends. The higher the ratio of works to ends, the higher the manifestation of scarcity. And here comes the most important relation between the two variables: if leisure time is an end in itself, as Hesiod thought it was, then this ratio becomes

complex (non-linear) because more work may not increase the satisfaction of ends, but reduce it, once a certain level of satisfaction (bliss point) is reached which includes the satisfaction derived from consuming leisure time. Contemporary economic analysis has made this an important determinant of an individual's co-decisions between work-time and leisure-time. Hesiod understood this relation very well and there are many passages in his book that illustrated this negative relation between work-time (means) and leisure-time (ends). Early on in his book, Hesiod stated that the intensity of scarcity determines the time left for leisure/idleness activities:

little time to waste in running around in the downtown (agora) has	ὥρῃ γάρ τ' ὀλίγη πέλεται νεικέων τ' ἀγορέων τε
he who has not stored in his house abundant means of life	ῥῆτινι μὴ βίος ἔνδον ἐπηετανὸς κατάκειται [30-31]

People must first bring to their house abundant (*ἐπηετανὸς*¹²) means of life (food, clothes, etc.) before they start wandering around in the downtown of the city, i.e., in the agora. They must reach a point of saturation, *κορεσσάμενος*, with the means of life before they engage in other activities. However, reaching the stage of saturation requires a lot of hard work. Hesiod was very straightforward that with the current natural conditions, human beings must work as hard as they can in order to avoid famine (*λιμὸς*), reach saturation (*κορεσσάμενος*) and enjoy abundance (*ἐσθλοῖσιν πολέεσσιν*¹³):

But you always remember my order, work, Perses of divine race, so that famine becomes your enemy, befriended by the wreathed venerable Dimitra	ἀλλὰ σὺ γ' ἡμετέρης μεμνημένος αἰὲν ἄρετμῃς ἐργάζεο, Πέρση, δῖον γένος, ὄφρα σε λιμὸς ἐχθαίρῃ, φιλέῃ δέ σ' εὐστέφανος Δημήτηρ αἰδοίῃ, βίотου δὲ τεῖν πιμπλῇσι καλήν [298-301]
so that your storage is full of the means of life	

Hesiod here clearly suggests that given nature, work and only work is the way to achieve abundance, or in his own words: if the warehouse (*καλήν*) is not totally filled up (*πιμπλῇσι*) with the means of life (*βίотου*).

In this paragraph, it becomes obvious that Hesiod made a link between the metaphysical conditioning of scarcity and the human being's role in mitigating the scarcity problem by working. However, even this distinction between the destiny determined by Gods and the pragmatic recommendation to work hard is interdependent because the Goddess of Agricultural Production (food), Dimitra, loves people who work. This is not novel to only Hesiod's work. In one of the Aesop's fables, there is a sailor who, after a shipwreck, called upon the Goddess of Athena to save him without himself having to do anything (move his hands and swim). The Goddess told him, "I am with you, but move your hands" (*σὺν Ἀθηνᾶ καὶ χεῖρα κίνει*). Some attribute this to Homer and others to Euripides. Hesiod made an economic theory out of this.

¹²As mentioned above, this is one of the many words Hesiod used to mean abundance. It can also be translated as "rich" and "sufficient".

¹³Another expression meaning abundance. *ἐσθλοῖσιν* means rich and *πολέεσσιν* means very much.

Thus, metaphysics go hand in hand with the reality of everyday life. If you work (move your hands and the other parts of your body), Gods will help you to produce more. Thus, work is to be praised and idleness to be condemned:

Work is nothing to be ashamed of, idleness is	ἔργον δ' οὐδὲν ὄνειδος, ἀεργίη δέ τ' ὄνειδος [311]
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I translate the word *ἔργον* as work, but I think a better interpretation of the meaning of the word would have been “production” or “work-production”. People’s first priority is to avoid famine. There are many references in Hesiod’s *Works and Days* about famine:

Think how you can find solutions to your needs and avoid famine	φράζεσθαι χρειῶν τε λύσιν λιμοῦ τ' ἀλεωρήν [401]
--	---

Hesiod suggested in such cases of desperation that hope is not sufficient to solve the acute scarcity problem:

Hope is not sufficient to feed a deprived man who seats in the clubs, when his means of life are not sufficient.	ἐλπίς δ' οὐκ ἀγαθὴ κεχρημένον ἄνδρα κομίζει, ἥμενον ἐν λέσχη, τῷ βίος ἄρκιος εἶη [500-501]
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In these cases, people must work and not waste their time in clubs¹⁴ because laziness forces people to beg for their food:

Lest after you become poor in other people’s houses beg and get nothing	μή πως τὰ μέταξε χατίζων πτώσεως ἀλλοτρίους οἴκους καὶ μηδὲν ἀνύσσης [394-395]
--	--

People must avoid laziness and napping if their means of life are not sufficient:

Avoid seating in shaded areas and napping During the harvest time when the sun burns the skin Run to bring the seeds into your house Walking up early in the morning so that your means of life are abundant	φεύγειν δὲ σκιεροὺς θώκους καὶ ἐπ' ἡδὲ κοιτὸν ῥῃ ἐν ἀμῆτου, ὅτε τ' ἥελιος χρὸς κάρφει. τημοῦτος σπεύδειν καὶ οἶκαδε καρπὸν ἀγινεῖν ῥῥου ἀνιστάμενος, ἵνα τοι βίος ἄρκιος εἶη. [574-577]
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Hesiod makes the connection between famine and laziness:

Because famine always accompanies the idle man	λιμὸς γάρ τοι πάνπαν ἀεργῷ σύμφορος ἀνδρὶ [302]
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¹⁴Hesiod made two references to the clubs (*λέσχη*), but gave no details. I assume that if someone’s wealth is sufficient then he can visit these clubs and spend some of his leisure time. It seems to me that he is not against them in general, but only in cases which people have not solved their scarcity problem. The same word has survived in Modern Greek as well meaning the same thing.

He stated that despite what Gods have decided about an individual's future and chance, working is better:

Whatever is your fortune, to work is best	δαίμονι δ' οἷος ἔησθα, τὸ ἐργάζεσθαι ἄμεινον [314]
---	---

Thus, the acute manifestation of scarcity which brings starvation and famine can be solved only with spending a lot of time to work and no time to leisure and/or be lazy. However, work not only solves the problem of famine, but it can make you rich with a lot of wealth if this is what you desire.

if your soul inside your mind craves wealth, do as I say, and one work after another work undertake	σοὶ δ' εἰ πλούτου θυμὸς ἐέλδεται ἐν φρεσὶν ἦσιν, ὧδ' ἔρδειν, καὶ ἔργον ἐπ' ἔργῳ ἐργάζεσθαι [381- 382]
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And in another section of the book:

With works men get a big herd and become rich	ἐξ ἔργων δ' ἄνδρες πολύμηλοί τ' ἀφνειοί τε [308]
---	---

Once you have solved the problem of scarcity and your coffins are full of the means of life, then you can enjoy your life (leisure time):

to enjoy the means of life taken from inside your house thriving reaching the bright spring, looking without the others who will have your need	καί σε ἔολπα γηθήσειν βίотου αἰρεόμενον ἔνδον ἐόντος. εὐοχθέων δ' ἵξεαι πολὺν ἔαρ, οὐδὲ πρὸς ἄλλους ἀυγάσαι• σέο δ' ἄλλος ἀνὴρ κεχηρμένος ἔσται. [475-478]
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Hesiod used another two words to show the utility individuals derive from consuming the means of life. I translate the word *γηθήσειν* as “enjoyment”, which also means rejoice from consuming something; in this case here, by consuming the means of life (*βίотου*). Hesiod's reference to being taken from inside your house means from your accumulated wealth since this is an annual planning of production.

The second word “*εὐοχθέων*” is unique in Hesiod which is also another indication of the deep economic background of his analysis. I translated the word as “thriving” (“prosper” could be another word), but what it literally means is to enjoy yourself from consuming plenty of material goods without the need to toil and suffer.

Now it is leisure time. Hesiod gives an excellent description of an example of how to use and enjoy leisure time, which today can be described as a picnic in the countryside. It is worth citing here the full description (taken from West's English translation of *Works and Days*):

When the golden thistle is in flower, and the noisy cicada sitting in the tree pours down its clear song thick and fast from under its wings in the fatiguing summer season, then goats are fattest and wine is best, women are most lustful, but men are weakest, because Sirius parches their head and knees, and their skin dried out with the heat. Then you want rocky shade and Bibline wine, a milking cake and the goats' last milk, and meat of a scrub-grazes cow that has not yet calved, and of firstling kids. And after it you want to drink gleaming wine, sitting in the shade, having had the heart's fill of food, facing into a fresh westerly breeze. From a perennial spring that runs away and is unclouded pour three measures of water, and the fourth of wine.

Ἥμος δὲ σκόλυμός τ' ἀνθεῖ καὶ ἡχέτα τέττιξ
 δενδρέῳ ἐφεζόμενος λιγυρὴν καταχέυει· αἰοδὴν
 πυκνὸν ὑπὸ πτερύγων, θέρεος καματώδεος ὥρη,
 τῆμος πιόταταί τ' αἶγες καὶ οἶνος ἄριστος,
 μαχλόταται δὲ γυναῖκες, ἀφαιρότατοι δὲ τοὶ
 ἄνδρες
 εἰσὶν, ἐπεὶ κεφαλὴν καὶ γούνατα Σείριος ἄζει,
 αὐαλέος δὲ τε χρῶς ὑπὸ καύματος· ἀλλὰ τότε ἦδη
 εἴη πετραίη τε σκιὴ καὶ βίβλινος οἶνος,
 μάζα τ' ἀμολγαίη γάλα τ' αἰγῶν σθεννυμένων,
 καὶ βοῶς ὕλοφάγοιο κρέας μὴ πω τετοκυῖης
 πρωτογόνων τ' ἐρίφων· ἐπὶ δ' αἶθοπα πινέμεν
 οἶνον,
 ἐν σκιῇ ἐζόμενον, κεκορημένον ἦτορ ἐδωδῆς,
 ἀντίον ἀκραέος Ζεφύρου τρέψαντα πρόσωπα,
 κρήνης τ' αἰενάου καὶ ἀπορρύτου, ἥ τ' ἀθόλωτος,
 τρεῖς ὕδατος προχέειν, τὸ δὲ τέτρατον ἰέμεν οἶνον.
 [582-596]

I do not think that any English translation or an adoption to modern Greek can really present the beauty of this description of a picnic of three thousand years ago.¹⁵ For example, the first line of the above excerpt Hesiod could have said simply, “in August”, but instead gave a description of the month which is a scenario for a cinematic play. It is the best description of the month of August in Greece even today. It is really amazing for a village man like Hesiod to give such a description. Not only must people work hard to acquire the scarce means of life, but enjoy consuming them along with other pleasures that usually the scarcity of means cannot buy.

However, Hesiod was aware that human beings are insatiable. Abundance may not be sufficient for some individuals. They might want more and their surpluses can be used to buy other people's property. In this case, Hesiod suggested the accumulation of property by buying other people's property:

Then you can buy the property of others, and
 not the others yours

ὅφρ' ἄλλων ὦνῃ κληρὸν, μὴ τὸν τεὸν ἄλλος
 [341]

Here, wealth is indicated by the word *κληρὸν*, another economic term which has survived unchanged into Modern Greek. Why would individuals want to accumulate more wealth if they have solved their scarcity problem? Hesiod developed his theory of deriving pleasure from not only the consumption of goods and leisure time, but from the accumulation of wealth itself for its own absolute pleasure, as well as relative to their neighbors.

Hesiod explained very well the existence of scarcity, but he also gives a metaphysical explanation of why scarcity exists and a pragmatic way out of this, which comes from technology and new discoveries. The metaphysical dimension of scarcity is examined in the next section.

¹⁵This description of a picnic has attracted the interest of many classicists; see Bershadsky (2011) for a discussion of the Hesiodic picnic and the relevant literature cited.

The Metaphysical Origin of Scarcity

Economics is the science of scarcity which is a permanent characteristic of human existence. However, no economist has ever answered the question: why does scarcity exist?¹⁶ I have not seen even a single hint in an economics textbook why scarcity exists. They assume its existence and then they try to explain how this affects or should affect the allocation of (rare) resources relative to needs. Hesiod's didactic textbook does better. Unlike modern economics textbooks, he offers an explanation of why scarcity exists which is an amalgam of good economic history and mythology. Hesiod stated what all modern economic historians accept: at an unspecified time period (most probably during the Neolithic period), men and women became food producers from food gatherers. Hesiod does not offer a non-metaphysical explanation of this important transition, i.e., some kind of innovation, population growth, climate change, invasions, civil wars etc. However, neither do modern economic historians. The "explanation" of settling down and the domestication of animals is not an explanation, but a definition of food production.

Hesiod's metaphysical explanation of the scarcity problem embeds a pragmatic solution. Technological advancements can mitigate the intensity of scarcity in the future—this is the hope left in Pandora's jar for the future human races to use, and this is what Prometheus' story of stealing the fire from Gods (discovery) symbolizes. Hesiod was optimistic that the future will be better. For the time being, people must work hard to get what was given to them with small toil or for free in the beginning. Also from Hesiod, the evolution of the human race is linked with the discovery of new resources such as iron. This issue is particularly important because it relates the metaphysical explanation of the existence and the intensity of scarcity to the realistic process of mitigating it.

Hesiod goes beyond these "natural" explanations of human behavior. He wants to explain why scarcity exists, but, most importantly, to explain how the human race can obtain more means to satisfy the undisputable fact of indefinite needs, if not at the individual level, definitely at the world level. Hesiod gave a metaphysical explanation in which embeds a pragmatic solution: technology. For the purpose of this paper, technology is defined as knowledge applied to a production process with an aim to reduce the intensity of the scarcity problem analyzed by economics (Papanikos, 1994).

Hesiod developed an unparalleled myth of Prometheus and Pandora which had a long-lasting effect on western thought. Four centuries after Hesiod's elegantly metaphysical explanation of the intensity of scarcity and its pragmatic solution through technology, the great dramatic play writer Aeschylus wrote a trilogy on Prometheus which unfortunately, only one survived. Aeschylus had Prometheus saying:

¹⁶Many economists confuse the definition of a concept with its explanation. Scarcity exists because the supply of goods and services is less than what people need. This is the definition of scarcity. The verb "exists" must be replaced with the verb "is". This is not an explanation (theory) of scarcity. However, this is not the only tautology in economics. The quantity theory of money is a tautology one because from an identity becomes, metaphysically, a functional (behavioral) relation.

All technologies for the mortals from πᾶσαι τέχναι βροτοῖσιν ἐκ Προμηθέως
Prometheus come [Aeschylus, *Prometheus*, 506]

Two comments should be made. I translated the Greek word *τέχναι* as “technology”. It is a mistake to translate it as “arts”. The etymology of the word Prometheus suggests forethought in the sense that one should study the things first. This way, technology requires knowledge. The discovery or the making of fire for productive use is not an art but a technology, and that’s what Prometheus symbolizes then and now, i.e., the discovery of new things to make people’s lives more comfortable.

More than two-and-half millennia later, Percy Bysshe Shelley in 1820 published his drama entitled, *Prometheus Unbound*. Of course, in economics Prometheus was used by David S. Landes in his book entitled, *The Unbound Prometheus: Technological Change and Industrial Development in Western Europe from 1750 to the Present*, first published in 1969.

To Hesiod it was clear that Prometheus was the personification of technology; the liberator of the human race from the intensity of scarcity. The legacy of Prometheus has been tremendous not only in the modern world, but in the classical world as well.

The myth has a very straightforward economic explanation. Humans’ destiny is not in vain. They can mitigate the intensity of the scarcity problem. For Hesiod, in both in *Theogony* and *Works and Days*, Prometheus appeared as a thief who stole the fire from Zeus (Gods). Fire is equivalent to technology. However, why would Prometheus need to do something like this if all goods were in abundance? The story that during a sacrifice to the Gods, Prometheus tricked them by keeping the best pieces of the animal also violates the abundance hypothesis. Why would Prometheus need to pull such a trick if meat was abundant? A non-economic explanation of the beginning of the myth would have been better, but Hesiod did not provide one. For example, Hesiod he could say that Prometheus stole a beautiful mortal girl from Zeus with the help of all mortals (humans). However, this explanation was already used to explain the Trojan War. Instead, Hesiod used another story with a beautiful woman who brought scarcity and sickness to humans. Pandora was the vehicle through which Gods punished the mortals for their “stupidity” to steal the technology of making fire from Gods. However, it is clear that hope is what was left for the humans, and this hope can come by new knowledge which can be applied to improve the conditions of living.

Hesiod used Prometheus’ story as a starting point that in the beginning there was abundance, but then Gods created scarcity by hiding the technology (fire) to retaliate because Prometheus deceived Zeus in the distribution of sacrificed animals. He made him choose one out of two packages and the one that looked better had only bones. I guess Zeus lacked the necessary foresight after all! If he had, he would have known that you cannot judge a book (present) from its cover.

Zeus got upset and retaliated against the entire human race by hiding the means of life: technology (fire). Or in Hesiod’s own words:

But Zeus wrathfully hid them
Because he was deceived by the crafty
Prometheus

ἀλλὰ Ζεὺς ἔκρυψε χολωσάμενος φρεσὶν ἦσιν,
ὅττι μιν ἐξαπάτησε Προμηθεὺς ἀγκυλομήτης
[47-48]

The first thing Zeus did was to hide fire, which I guess was considered the most important innovation of the human race. Imagine what would happen today if Gods were to hide all energy sources from humans. In Hesiod's own words, Zeus:

For this reason, he planned for people pernicious
things by hiding the fire

τοῦνεκ' ἄρ' ἀνθρώποισιν ἐμήσατο κήδεα λυγρά.
κρύψει δὲ πῦρ [49-50]

Prometheus, with a very illustrious description, stole the fire from Zeus. Gods then colluded to prepare the most destructive weapon for men: a very beautiful woman in appearance (a sexbomb in modern language), but a satanic mind. Zeus thought that this will destroy men because they are very weak and they will "embrace with tenderness their own destruction". Hesiod's description is really superb. He made Zeus say the following:

Instead of fire I will give them destruction, so
that all
will be happy in their heart by embracing their
destruction

τοῖς δ' ἐγὼ ἀντὶ πυρὸς δώσω κακόν, ᾧ κεν
ἅπαντες
τέρπωνται κατὰ θυμὸν ἐὼν κακὸν ἀμφαγαπῶντες
[57-58]

Then, Zeus called upon Hephaestus, the artisan/the handyman, to create a woman and then all other Gods gave her external and internal gifts, as these were requested by Zeus. The woman was called Pandora (all-gifted) because all Gods gave her gifts. Zeus's purpose was to seduce the men of the human race with her sexy appearance, but with an ugly soul and heart. I very much like Pandora's myth, but I do not understand why Zeus:

... then asked Athena
to teach her the works, the assorted loom to
waive

αὐτὰρ Ἀθῆνῃν
ἔργα διδασκῆσαι, πολυδαίδαλον ἱστὸν ὑφαίνειν
[63-64]

The last thing a man would ask a sexy woman is whether she knows how to weave, unless in Hesiod's time this had a hidden sexual connotation. This is really a surprise, but my serious interpretation is that women were productive and Hesiod wanted to emphasize the role of women in this archaic division of labor.

I do not think that Hesiod himself was satisfied with this metaphysical explanation of scarcity, and for this reason he offered another one which has also received a lot of attention. Throughout the centuries it constitutes the backbone of his theory of economic history as I further explain in Papanikos (2022c). As with Prometheus and Pandora, his theory of economic history started with abundance.

Unfairness, Theft and Begging

Hesiod distinguished between ethical (good) ways of solving the scarcity level and immoral (bad) ways of acquiring the scarce means of living. At the level of the individual, Hesiod distinguished three ways of unethical acquisition of the means for living: injustice which favors one individual like Hesiod's brother, theft and begging. All three are examined here.

Injustice and Unfairness

Hesiod relates his ethical behaviour to Gods. Those who steal money are condemned, but those who make money in an honest way are much better.

Money should not be stolen, those which are given by Gods are much better. Even if violence is used to steal wealth or with lies, as many times happen, when profits deceive people's minds, and the shame is overcome by shamelessness; easily Gods blacken him, diminishing their business.

χρήματα δ' οὐχ ἄρπακτά, θεόσδοτα πολλὸν ἀμείνω.
εἰ γὰρ τις καὶ χερσὶ βίη μέγαν ὄλβον ἔληται,
ἢ ὅ γ' ἀπὸ γλώσσης ληίσσεται, οἷά τε πολλὰ γίγνεται, εὖτ' ἂν δὴ κέρδος νόον ἐξαπατήσῃ ἀνθρώπων, αἰδῶ δέ τ' ἀναιδείῃ κατοπάζῃ.
ῥεῖτα δέ μιν μαυροῦσι θεοί, μινύθουσι δὲ οἶκον [320-325]

I translated the above, using almost the exact words as Hesiod does. In these six verses, there are so many words which, then and now, have a sound economic meaning. The word *χρήματα* meaning “money” is used today in Modern Greek. The word *ὄλβον* means “wealth”. The word *κέρδος* is used today to mean “profits”, having the same meaning as three thousand years ago. The word *οἶκον* means in this context (family) business.

Hesiod considers that any society that is not ruled by justice alone will in the long term disappear as all races did in the past. This is well documented in his concise theory of economic history and his theory of economic growth. Individuals in such a society can use their power and money to bribe the judges and get other people's property and money. Hesiod described Perses, his brother, as such an individual, but, at the same time, he warns the basileis (who were the judges at the same time) to judge the economic differences between two individuals fairly and to not take bribes. Early on in his text Hesiod calls the judges “gift-eaters” (*δωροφάγους*) which is an excellent way to say that they are bribed by gifts:

... great tributes to the gift-eaters kings,
who this way legal differences want to judge

μέγα κυδαίνων βασιλῆας
δωροφάγους, οἳ τήνδε δίκην ἐθέλουσι δικάσσαι [38-39]

Hesiod makes an entire “lecture” [213-221] to his brother because injustice has no future and it is very difficult even for the kings-judges to bear, and impossible for a single individual to endure it.

This is the essence of Hesiod's practical moral philosophy. People must be good because this is not only what Gods like, but it seems to be the best long-term strategy. My interpretation is not that Gods punish the injustice, but also the

uncertainty of life creates such unexpected difficulties which an individual can bear easier with justice rather than injustice. Unlike many other religions and beliefs, Hesiod here seems to suggest that people pay for their injustice in this world during their current life and not in an afterlife stage. Thus, Hesiod stated that men who straight judge never face famine (*λιμός*):

Never with straight judges, men face famine	οὐδέ ποτ' ἰθυδίκησι μετ' ἀνδράσι λιμός ὀπηδεῖ [230]
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However, there are many other excerpts where Hesiod mentions and condemns criminal (unjust) behavior. One must always keep in mind that Hesiod wrote the *Works and Days* in reaction to the unjust behavior of his brother and of the judges (*basileis*) of his time. He denounced violence:

And now pay attention to justice, and totally forget violence	καὶ νῦ δίκης ἐπάκουε, βίης δ' ἐπιλήθεο πάμπαν. [275]
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Unlike in the animal world, God has given justice to the human race, which is much better.

Gave justice to people, which is much better	ἀνθρώποισι δ' ἔδωκε δίκην, ἣ πολλὸν ἀρίστη γίνεται [279-280]
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Not only from a moral point of view is justice is better, but Hesiod developed a theory that in the long-term, injustice and criminal activities lead to the detriment of the future generations.

Hesiod continues to lecture his brother that good behavior is better than a criminal one. The latter might look better in the beginning, but there is nothing that compares with virtue.

Theft

He relates theft to the lack of means of life, i.e., individuals inflicted by scarcity. Hesiod relates this scarcity to laziness. Hesiod writes that,

The idle man who vainly hopes for the lacked means of life, bad thoughts come to his mind	πολλὰ δ' ἀεργὸς ἀνὴρ, κενεὴν ἐπὶ ἐλπίδα μίμων, χρηίζων βιότοιο, κακὰ προσελέξατο θυμῷ [498- 499]
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This is similar to what Solon, one of the seven sage men of the ancient times, said almost one century after Hesiod's *Works and Days*, which has survived until today: "idleness is the mother of all badness." I am sure Solon had read *Works and Days*, but nobody could tell that his apothegm was inspired by Hesiod's book.

Hesiod has an excellent description of the thief. He is an idle man who sleeps during the day so he can thief during the night when the hard-working people of the day sleep. The thief enters into their houses and warehouses and steals their valuables. Hesiod made a beautiful note of that in the following excerpt giving advice to honest people of how to protect their valuables.

and get a sharp-teeth dog, don't spare its food,
just in case that the day sleeping man takes your
valuables

καὶ κύνα καρχαρόδοντα κομῆν, μὴ φείδεο
σίτου,
μὴ ποτέ σ' ἡμερόκοιτος ἀνὴρ ἀπὸ χρήμαθ'
ἔληται [604-605]

I translated the word *χρήμαθ'* as valuables, but the word in Modern and Ancient Greek means “money”. In *Works and Days*, it means more than that and may include all useful (valuable) things such as money, goods (food), any form of wealth (utensils, furniture etc.). The day sleeping man *ἡμερόκοιτος ἀνὴρ* is the thief.

Begging

Begging might work one or two times, but it cannot be sustained in the long term. The same can be said for theft and unfairness (injustice).

The idle men are similar to the drones in the bee world who steal the work of the bees which is unethical. Gods and people do not like such behavior.

Gods and people get upset with those who live
without work

τῷ δὲ θεοὶ νεμεσῶσι καὶ ἄνδρες, ὅς κεν ἀεργὸς
ζῶη, [303]

However, Hesiod welcomed the good competition. He had a clear view that people derive utility from comparing their wealth to other people's wealth and work hard to surpass them. This is called by contemporary economists, the demonstration effect, as I have already mentioned.

Health and Scarcity

Hesiod's definition of scarcity does not include only the lack of means of life, but relates to health as well. Contemporary economists have developed indices to measure this dimension of scarcity of health. In that initial state of human race, people lived in abundance, they also lived without severe diseases, *νούσων τ' ἀργαλέων*, which resulted in death, *κῆρας*. A few lines below, Hesiod defined the lack of health and the existence of serious sicknesses, day and night:

Human diseases day and night hit people
automatically bringing them many bad.

νοῦσοι δ' ἀνθρώποισιν ἐφ' ἡμέρη, αἱ δ' ἐπὶ νυκτὶ
αὐτόματοι φοιτῶσι κακὰ θνητοῖσι φέρουσαι
[102-103]

Leisure and Recreation Time

Good health is necessary to enjoy leisure and recreational activities as was demonstrated above. Assuming good health, they can enjoy the rest of their time off. Thus, scarcity includes the scarcity of work time as well. One day's work is not sufficient, but as Hesiod explained scarcity manifests itself with the need of people to work hard all year long to provide the means of life.

However, if one has the means of life provided, then he has solved the scarcity problem and he can enjoy himself. Robbins has analyzed this reverse relation between work and leisure and (1932, p. 12) stated, “In the first place, isolated man wants both real income and leisure. Secondly, he has not enough of either fully to satisfy his want of each. Thirdly, he can spend his time in augmenting his real income or he can spend it in taking more leisure. Therefore, he has to choose. He has to *economize*. Whether he chooses with deliberation or not, his behaviour has the form of choice. The disposition of his time and his resources has a relationship to his system of wants. It has an economic aspect” (*italics added*). I emphasize here the word “economize” because it is very important in defining economics relevant to scarcity.

The Meaning of the Word *Οἶκος* in Economics

Scarcity defines economics as many economists learned from their introductory course. Is this all? Economics is what economists do! Since this is a tautology, I may paraphrase it and state that economics is what Hesiod did in his *Works and Days*! Hesiod did not use the word *oikonomia* which is a synthetic word from *oikos* and *nomos*. The word was used later by Xenophon and many others thereafter. On the same token, no ancient Greeks used the word “technology” which is a synthesis of the two words: *technai* and *logos* or ecology, which is the synthesis of *oikos* and *logos*. However, the word *technai* was used to mean what today is called technology as mentioned above. The protection of the environment was a priority in ancient Greece and especially in ancient Athens when it became too crowded, as many writings have mentioned the many laws created to protect the hygiene of the polis.

However, I would like to offer another interpretation of the word *oikos* (*οἶκος*), which appears so many times in Hesiod’s *Works and Days*. I shall argue in this section that the word “*oikos*” (*οἶκος*) has many meanings; one of these is “business enterprise”. Hesiod clearly stated that the purpose of the *οἶκος* (business enterprise) is to make profits (*κέρδος*) or money (*χρήματα*). The two Greek words – *κέρδος* and *χρήματα* – are used today in any contemporary Greek economics textbook. The Greek language has no other direct words to describe profits and money. Hesiod used exactly the same words, as shown below, with the same etymology, the same spelling, and the same intonation. Diachronically, economic jargon at its best!

Not only did the word “*oikos*” means “a business enterprise”, but it also has survived into Modern Greek expressions such as “commercial enterprise” (*εμπορικός οἶκος*), “publishing house” (*εκδοτικός οἶκος*), “fashion business” (*οἶκος μόδας*), “nursing home” (*οἶκος ευγηρίας*), a “whorehouse” (*οἶκος ανοχής*) and many others which denote any form of institutional economic association in general. Also, the word *οἶκος* stands for something more than a “house” or a “home” made of bricks and mortar. It means all the areas of the world that are inhabited by people. For example, the word *οἰκουμένη* is an Ancient Greek word from *οἶκος* and *μένω* (stay) meaning the entire known inhabited world, i.e., the

universe or an ecumenical world. The latter can be translated with a twentieth century neologism of globalization.

Hesiod used the word *οἶκος* more than ten times in his *Works and Days* and in most cases, as explained below, the meaning of the word makes no sense unless it is translated as “business enterprise”. Of course, as is even the case in Greece today, a business enterprise in Hesiod’s period was a family business; not relatively small, but nevertheless a family business with all the common characteristics of such business enterprises. Hesiod is talking about a family business of the eighth century BCE, which is comparable with any family business in contemporary Greece in the same sector such as farming, stock-breeding, artisan (*technai*), artists, commercial seafaring, etc. A Greek family business, then and now, can be a very large company, not only according to Greek standards, but according to present global standards. Many Greek shipping companies that are at the top of the world are, strictly speaking, family businesses.

Hesiod uses another word to describe big business and gives an emphasis to the business meaning of the word, *οἶκος*. In line 377, he uses the word *ἐν μεγάροισιν*, which can have no other meaning, but to mean “a business estate”. Hesiod did not mean a house with bedrooms, but the *οἶκος* with all the economic activities and capital of a family business that produced profits by using land, capital of all sorts, labor of all sorts, and managerial skills. They may also engage in trade (including dangerous seafaring) to make more profits and import goods not produced locally. How much better can a contemporary economist can put it, than Hesiod’s clear statement of making profits from selling your produce abroad using seafaring:

And then the fast ship to the sea pull, with the freight inside Get ready to put to sea, so that in your business bring profits	καὶ τότε νῆα θοὴν ἄλαδ' ἐλκέμεν, ἐν δέ τε φόρτον ἄρμενον ἐντύνασθαι, ἵν' οἴκαδε κέρδος ἄρῃαι [631-632]
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It is clear from the above passage that the word *οἴκαδε* makes sense only if it is translated as a business enterprise irrespectively if it is a family business, which was the only type of business enterprises that existed in Hesiod’s time and is still the dominant form of enterprise in the contemporary capitalist Greek economy.¹⁷

Hesiod continues a few lines below giving his theory of economies of scale in seafaring (emporium):

The maximum the freight, the maximum the additional profits	μεῖζων μὲν φόρτος, μεῖζον δ' ἐπὶ κέρδει κέρδος [644]
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All words of this line you find in any general modern Greek economics textbook, and particularly an introductory textbook of the economics of shipping. The excellent expression, *ἐπὶ κέρδει κέρδος*, from the above passage means additional profits: “add profits to profits”, which is the result of a larger freight inside the ship. This is always true with shipping. Technology is the only constraint to building the largest possible commercial ships. Hesiod knew it.

¹⁷This is the reason that I have argued in Papanikos (2015) that it is very difficult to handle tax evasion in Greece because there are so many small family businesses.

It is interesting to note that commercial shipping is the number-one activity of contemporary Greek business people. All of them are family businesses, pretty much like in Hesiod's times. As a matter of fact, Greece has one of the highest percentages of the so-called independent (family) business in the world. I mention this because there is a strand of economic historians who claim that the ancient (Greek) economy cannot compare with the "capitalist" economies of the modern world. They are wrong. They reach these conclusions because they make the mistake to compare the wrong "spaces" or "ecumenies". Contemporary Greek capitalist economic activities look pretty much like Hesiod's period which differs from other advanced countries not in the objectives (profit and utility maximization), but in natural and institutional constraints. I can argue that contemporary Greeks follow this long tradition of organizing economic activities, at least if one looks at the Greek commercial shipping throughout the centuries, or if I may exaggerate, over all the historical millennia. One must be very careful and explain all factors that give rise to the characteristics of the Greek economy which tend to persist for so many centuries. In other words, the difference is not so much between economic systems (archaic or modern), but on natural and man-made (institutional) constraints.

Thus, Hesiod is talking about profits and money which can be made by engaging in economic activities taking place in the institution of a business enterprise called "oikos". As mentioned above, Hesiod used the word *οἶκος* many times. The first appearance is early on in line 23 when Hesiod is talking about the fair and unfair competition between the various professions (business). Hesiod's argument is that the fair competition is the one which forces people, assuming justice and peace (no violence), to compete in their economic activities (business) of farming, stock-breeding, building, wielding by copper and iron smiths, logging, entertaining, etc. As in any business, profits can be made with good management:

Your business well managed

οἶκόν τ' εὖ θέσθαι [23]

There is no question that Hesiod talked in this line about business enterprises (various economic activities). He gave the examples mentioned above to indicate what is meant by *οἶκόν τ' εὖ θέσθαι*; he definitely did not mean the utility bills of his family home because he talked on this in another occasion. Later on, Hesiod gave an excellent description how one must organize his farm business. In an informative passage he states:

In your business first get an ox to plough, a woman, not by marriage, so that she follows the oxen
money have in the business everything must be prepared in advance
in case you ask from others, they refuse, and you do not have
lost time, decreases your production
don't postpone for tomorrow and the day-after-tomorrow
because the man who works without profit does not full his warehouse
nor the dilatory; diligence promotes production;
always the neglectful man fights with losses.

Οἶκον μὲν πρότιστα γυναῖκά τε βοῦν τ' ἀροτῆρα,
κτητὴν, οὐ γαμετὴν, ἥ τις καὶ βουσὶν ἔποιτο,
χρήματα δ' ἐν οἴκῳ πάντ' ἄρμενα ποιήσασθαι,
μὴ σὺ μὲν αἰτῆς ἄλλον, ὃ δ' ἀρνῆται, σὺ δὲ τητᾷ,
ἢ δ' ὥρη παραμείδηται, μινύθῃ δὲ τὸ ἔργον.
μηδ' ἀναβάλλεσθαι ἔς τ' αὖριον ἔς τε ἐνηφιν•
οὐ γὰρ ἐτωσιοεργὸς ἀνὴρ πύμπλησι καλιῆν
οὐδ' ἀναδαλλόμενος• μελέτῃ δὲ τὸ ἔργον ὀφέλλει•
αἰεὶ δ' ἀμβολιεργὸς ἀνὴρ ἄτησι παλαίει.
[405-413]

The word *οἶκος* is mentioned two times in this passage and of course means a business enterprise, otherwise it does not make sense. Hesiod talked about a woman, and differentiates her from the woman-wife, which he makes a specific note that she is not your wife, but she will work in the fields along with the oxen. My interpretation is that Hesiod knew, as many men know today, wives rarely obey men. Given that he was against the use of violence in general, his suggestion makes perfect sense and many men should follow his advice if they want to have a happy family life. Presumably, if this was a self-sufficient small family farm, Hesiod's wife would work on the fields as is still the case today in Hesiod's village. However, Hesiod advises all men how to choose a wife.

The above passage gives solid business advice of how to increase production, make profits and reduce losses. Everything is in the management of *οἶκος* or the business enterprise.

The word *οἶκος* is also used to mean “family” and especially “family size”. When Hesiod discusses injustice, he warns that Gods punish men and their societies as well as their families by making women not able to bear children:¹⁸

Nor women bear children, diminishing the household size	οὐδὲ γυναῖκες τίκτουσιν, μινύθουσι δὲ οἶκοι [244]
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Hesiod talked here about the ecumenical world because the word *οἶκος* is used in the plural form. All households (*οἶκοι*) are affected by Gods' wrath who punish unjust societies. Now, the interpretation of the word *οἶκοι* is difficult because it can mean more than a family and it can include everything, particularly even their business. In a passage discussed extensively in Papanikos (2022a), Hesiod believed that more children are better because they can work in the family business enterprise (*πατρώιον οἶκον*), and in this way they can increase its wealth.

Only one child should be maintaining the family business	μονογενῆς δὲ πάις εἴη πατρώιον οἶκον
Because this way wealth increases in the estate	φερδέμεν ὥς γὰρ πλοῦτος ἀέξεται ἐν μεγάροισιν.
Dying old another child must be left behind	γηραιὸς δὲ θάνοις ἕτερον παῖδ' ἐγκαταλείπων [376-378]

However, the same expression (*μινύθουσι δὲ οἶκοι*) is used in another passage which can also be interpreted as related to business.

Easily then Gods disgrace them, decreasing their business	ρεῖτα δὲ μιν μαυροῦσι θεοί, μινύθουσι δὲ οἶκον
Only for short time wealth follows them	ἀνέρι τῷ, παῦρον δὲ τ' ἐπὶ χρόνον ὄλδος ὀπηδεῖ [325-326]

The word *οἶκος* was used to describe the houses of the third race, which I interpret as it was used within the concept of universal or ecumenical description of the entire inhabited world:

Whom their weapons were made of bronze, of bronze were their houses	ὧν δ' ἦν χάλκεα μὲν τεύχεα, χάλκεοι δὲ τε οἶκοι
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¹⁸It should be noted that this line may be a later addition to Hesiod's *Works and Days*, but is consistent with what Hesiod described in this section.

They work with bronze; the black iron did not know. χαλκῷ δ' εἰργάζοντο• μέλας δ' οὐκ ἔσκε σίδηρος [150-151]

However, Hesiod does use the word *οἶκος* to mean “home” (bedrooms and living room). He was very clear and explicit about this. In one occasion, Hesiod was discussing the climatic conditions and especially the cold and rain. He advises that once they do their work people should return to their home to be protected:

Once works are finished go to your home ἔργον τελέσας οἰκόνδε νέεσθαι [554]

Here Hesiod made a clear distinction between the “space” of the work and the space of the home. These two spaces were not the same. Home is where people go to rest and sleep which is the meaning of the word *οἰκόνδε* here. Exactly the same word is used when Hesiod advised when the seafaring trade should be done, i.e., before the fall and winter so that the weather is good. Once you have done the seafaring on time, Hesiod recommended to return fast to your home to avoid the bad weather:

Bring to the sea your ship with all the freight put inside ἐλκέμεν ἐς πόντον φόρτον τ' ἐς πάντα τίθεσθαι, σπεύδειν δ' ὅττι τάχιστα πάλιν οἰκόνδε νέεσθαι [672-673]
Run then fast again and to your home return

Again, it is obvious the separation of the home-space and the business-space. People in the seafaring business make money travelling abroad so to speak and when they finish, they must return to the safety of their home.

The above analysis shows that the word *οἶκος* by Hesiod in *Works and Days* meant both the business enterprise, which uses factors of production to make profits and accumulate wealth, but, at the same time, it was used to mean home where one rests and sleeps. Pretty much like in Modern Greek

Conclusions

Scarcity defines economics as was pointed out by Robbins (1932). However, so thought Hesiod in the 8th Century BCE. Both explained scarcity as a phenomenon, without which there would be no need to do economic analysis or economize. The purpose of this paper was to show that Hesiod was not only the first to make scarcity the foundation of his economic analysis, but he did it much better than Robbins.

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