Unemployment and Job Creation in a Prosperous Economy

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Abstract

Most of the population in the Western world lives in prosperous societies today. However, Economics, according to its traditional definition, deals with allocation of resources in conditions of scarcity. Since the pressing problems nowadays are associated with abundance rather than with shortage, a new way of thinking is needed in order to cope with challenges, such as *technological unemployment*, which have not been experienced in previous eras. My purpose in the present article is to define the *prosperous society* and to discuss the phenomenon of unemployment in this society. I will argue that in order to describe and handle this sort of modern problem, new concepts and new economic models are needed.

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1. What Went Wrong with Economics?

Since the publication of *The Wealth of Nations* (Adam Smith, 1776) the science of economics has developed enormously and has become a highly mathematical domain, more than any other branch of the social sciences. Nevertheless, we often find disagreement among prominent economists, pertaining to the most efficient way to solve problems and crises, as well as concerning the anticipated results of a certain economic policy. Why is it that economics, with all its advanced theories and mathematical equations, so often fails to give unequivocal explanations to economic phenomena and a clear-cut reliable forecast of future events? As the title of an article on the 2008 crisis asked, *What Went Wrong with Economics?* (Economist, 2009).

A part of the answer is that, unlike the laws of nature which are eternal and unchanging, the rules of economics are time-dependent rather than absolute, as Screpanti and Zamagni (2010) wrote:

> The reality studied by the economist is not fixed like that of the natural sciences. Economic facts change through time and space, problems which appear crucial in a certain period may be irrelevant in another, those that are considered important in one country can be completely ignored in another (p.8)

Consequently, economic models which were useful in the past are not necessarily suitable for present situations. This disparity between theoretical models and reality is one reason for the difficulty in explaining and predicting economic processes. Eventually, new circumstances beget new and more suitable theories but, in the interim, old theories are inevitably used for situations for which they may not necessarily be perfectly suitable.John Kenneth Galbraith (1958) who named the old theories *the conventional wisdom*, wrote:

> The enemies of the conventional wisdom are not ideas but the march of events. ... The fatal blow to the conventional wisdom comes when the conventional ideas fail significantly to deal with some contingency to which obsolescence had made them palpably inapplicable (p. 10).

On the failure of the conventional wisdom to handle the 1929 crisis, Galbraith wrote:

> Almost everyone called upon for advice in the early years of the depression was impelled by the conventional wisdom to offer proposals designed to make things worse. (Galbraith, 1958, *ibid*).

The gap between the economic reality today and the established theories of the past stems, inter alia, from the fact that we live in a prosperous society while economics – from the classical period to the neo-Keynesian age – deals with allocation of resources in conditions of shortage. Since the urgent economic problems are currently connected to prosperity rather than to shortage, new tools are needed to tackle the modern dilemmas. In the next sections I intend to define *the prosperous society*, and discuss one problem which is unique to this society, namely unemployment due to technological progress.

2. The Affluence Vision

The concept *Affluent Society* was coined by Galbraith who pointed out that in modern times:

> The ordinary individual has access to amenities – food, entertainment, personal transportation, and plumbing – in which not even the rich rejoiced a century ago (Galbraith 1958, p. 2).

Previous economists had already described this situation of prosperity, although not as an existing reality but rather as a future dream. Adam Smith in 1776 sketched an optimistic view of a developed economy which could provide humanity with all its needs[1]. John Stuart Mill described in 1848 a future paradise of

> a great increase of aggregate wealth, and… a better distribution of it; that not only the rich might grow richer, but many of the poor might grow rich, that the intermediate classes might become more numerous and powerful, and the means of enjoyable existence be more and more largely diffused (Mill, 1848).

In 1930, amidst the Great Depression, Keynes (1933) published an essay called "Economic Possibilities for our Grandchildren"[2] in which he envisioned a state of economic prosperity which would prevail in Britain and the other Western countries within one hundred years at the latest:

> All this means in the long run that mankind is solving its economic problem. I would predict that the standard of life in progressive countries one hundred years hence will be between four and eight times as high as it is. … a hundred years hence we are all of us, on the average, eight times better off in the economic sense than we are today. … the economic problem may be solved, or be at least within sight of solution… (Keynes, 1933).

The reason for the prosperity according to Keynes is the ever-growing industrial productivity, due to accumulating technological innovations. It should be mentioned that prior to that optimistic paragraph, Keynes uttered his concerns that, in the short term, the technological innovations might cause unemployment. However, he wrote, the crisis will be brief and, in the long term, technology will prove beneficial.

3. Abundance versus Scarcity

The prosperity vision of Adam Smith, Mill, Keynes and others began to materialize after World War II, first in the United States and then in Western Europe and Japan. In 1958, Galbraith already referred to the affluent society in Britain and the United States as an existing phenomenon rather than a dream

[1] Thomas Malthus (1798) challenged this vision by arguing that the increase in food production never catches up with the rate of the population growth, and therefore humanity is doomed to overpopulation and starvation. In retrospect, Smith's optimism seems to prevail in developed countries, although the fast population growth in other regions of the world justifies Malthus' concerns.

[2] The essay was published in two parts in *The Nation and Athenaeum*, Vol. 48, 1930 (no. 2, p. 36-37 and no. 3, p. 96-98) and was later reprinted in a book (Keynes, 1933).

for the future. From the 1960s to the 1990s, the affluence spread to further countries in East Asia (i.e. Hong Kong, Singapore, South Korea and Taiwan which, during this period, maintained an annual growth rate of more than 7%). Since the fall of Communism in 1989, this affluence has extended to East Europe as well. Although most of the world's population still lives in conditions of scarcity, abundance is becoming the lot of growing circles which have great influence on the global economy. It is therefore worthwhile to study the economy of the *prosperous society* and discuss its special problems.

One of the problems facing a prosperous society is the unequal distribution of income and the ownership of property. It is well-known that even in wealthy countries not everyone enjoys prosperity, and there are large gaps between the living conditions of the upper and the lower deciles. However, the fact that not all citizens participate in the "good life" does not refute the definition of the country as a prosperous society. If 20% or 30% of the families live below the poverty threshold, but a more equal distribution of income could provide comfortable living conditions for the entire population, we can define the country as a prosperous society that one of its problems is inequality.

It should be remembered that, in the past, a more fair allocation of resources would not have solved the problem of poverty because even economic egalitarianism could not provide all the citizens with decent living conditions by our present standards. The basic definition of Economics in the past referred to scarcity. It was defined as the science which investigated how scarce resources could be optimally exploited in order to meet, in the best possible way, the diverse needs of the population. Lionel Robbins' definition of Economics in 1932 was:

> Economics is a science which studies human behaviour as a relationship between ends and scarce means which have alternative uses (Robbins 1932, p. 15). … the subject-matter of Economics is, as we have seen, conditioned by the scarcity of *given* means, for the attainment of *given* ends. (*ibid* p. 45).

At that time, due to the assumption that resources are always limited and cannot satisfy all the wishes of all the people, economic theory concentrated on the study of equilibrium between the demand that can never be fully satisfied, and the supply which is always limited and cannot meet all the needs. Another basic assumption of classical economics is the existence of a free market, where each producer is allowed to produce what she wants and can produce, and each consumer can buy anything from any producer he choses. Hence a competitive process arises among all the players in the market, where the interest of the individual consumer is to maximize his utility, while the interest of the producer is to maximize her profit. This is a core principle of Economics, from Adam Smith's vague and un-quantitative formulation, through Alfred Marshal's supply and demand curves, to the complex mathematical equations describing Neo-Walrasian equilibrium in a market with a myriad sort of goods, countless consumers with different tastes and preferences, and a multitude of producers, big and small, trying to predict consumers' desires (De Vroey, 2002).

This glorious structure was based on the axiom of shortage: there are never enough resources to satisfy everyone's wishes. Thus, for example, if an individual can afford food for a certain sum of money each week, and his consumption includes one kilogram of tomatoes, if the price of tomatoes rises from 2 to 4 dollars per kilo, he will have to decide whether to reduce the consumption of tomatoes or cut down another commodity, such as cucumbers. But what happens in a prosperous society in which it makes no difference to the typical consumer if he needs to spend two extra dollars – or even ten – each week in order to have his daily tomato? Moreover, according to classical economics, if the price of tomatoes drops from two dollars to one dollar, the quantity of tomatoes the consumer buys will grow (not twofold because of the law of "diminishing marginal utility" but, let's say, from one to one and a half kilos). But if the person habitually consumes exactly one kilogram of tomatoes per week, what will he do with the excess amount - buy and dump?[3]

In this example, the classical model of supply and demand does not fit the reality of the prosperous society. In many other cases, this model is still valid [4]including situations of inelastic demand or supply, i.e. situations which are insensitive to changing prices. However, where there is no shortage, and the manufacturing system quickly delivers any commodity required by the consumers (and even tries to persuade them to purchase more than they really need, by aggressive advertising and marketing), the laws of demand and supply are not as relevant as they were in the times of scarcity. [5]

4. Defining the Prosperous Society

The examples in the previous section show the gap between contemporary economic reality in developed countries and economic theory. The models taught in basic economic courses deal with

[3] According to some research, about half of the food produced all over the globe is thrown into the garbage. This is one of the less pleasant sides of the prosperous society (Smithers, 2013).

[4] One might argue that the classical model is relevant to the tomato case as well, since when the supply of a certain agriculture product in the market diminishes, at least some consumers will buy less, otherwise the price will skyrocket. But another realistic option is that the product will be sold out, and some consumers will not be able to acquire it at any price. It negates the assumption of traditional economics that there is always an equilibrium price, so that all consumers who are ready to pay that price get the amount they want, and all the producers who are willing to sell for that price sell all their stock.

[5] Frequently, price adjustment is achieved not by supply-demand curves and competition between manufacturers, but by other measures, such as administrative regulations and consumer protests. Another deviation from traditional economics is related to the "indifference curve," which represents different combinations of goods to which the consumer is indifferent. According to conventional theory, consumers always aspire to reach the highest indifference curve they can afford. Thus, an increase in one's income, or declining prices, will always transfer her to a higher curve with a greater amount of products. However, in a prosperous society, many buyers are satisfied with the consumer-basket they have and do not wish to enlarge it by spending more money on products. The reason for the gap between theory and practice in this case is the fact that in the traditional theory, the law of diminishing marginal utility applies to each product individually rather than to the aggregate consumption. In a prosperous society, the law should apply to the total individual consumption which would require a change in basic economic theory (d'Orlando & Sanfilippo, 2010).

issues that were once important, but are less crucial in today's prosperous economy, while the real problems of our wealthy civilization do not always receive proper attention. Before discussing the technological unemployment problem which is the main subject of this article, I wish to have a precise definition of the term *prosperous society*. Instead of vague phrases, such as "living conditions previously unknown," I would like to delineate clear criteria which distinguish between a prosperous society and other societies.

The definition I wish to offer is based on the assumption that the main goal of an economic system, in the capitalist economy as well as in other economies, is to provide the consumers with the variety of goods and services they need. A prosperous society can be defined as one that is able to achieve that goal, namely, provide the citizens with all the products and services they require. How can it be ascertained that this objective has been achieved? Can a limit be put on consumers' aspirations for more and more luxuries? This question can be answered by social studies which explore the various needs of a population, and establish criteria for reasonable economic welfare.[6] These criteria usually define two types of provisions:

1. Necessary or essential supplies like food, clothing, medical care, shelter, etc.
2. Less vital necessities, such as entertainment, sport, vacations and other luxuries.[7]

The prosperous society might be defined as a society in which everyone is provided with all the products of the first type, and at least some products of the second type. Keynes (1933), for example, distinguished between two classes of needs. The first class is "absolute needs" which are necessary in any situation. The second class is "relative needs" whose main purpose is to make us feel superior to our fellows. He wrote that even in the wealthy society which he envisioned one hundred years in advance, the needs of the second class, which satisfy the desire for superiority, may still be insatiable. As for the first class, he believed that

> a point may soon be reached, much sooner perhaps than we are all of us aware of, when these needs are satisfied in the sense that we prefer to devote our further energies to non-economic purposes (Keynes 1933, p.365-67).

I now want to argue that this classification is irrelevant in the present discussion. In economical terms, there is no difference between basic products and luxury ones as long as the consumers think they need these products. I therefore prefer to adopt a broader definition of a prosperous society, according

[6] One example is the "capabilities approach" of Martha Nussbaum and Amartya Sen (1993; Nussbaum, 2011) which deals with universal needs and basic capabilities which are essential to wellbeing.

[7] A useful distinction between *necessity goods* and *luxury goods* is based on the behavior of the demand curve. When income rises, the demand for necessity goods rises less steeply than income, and the proportion of expenditure on these goods falls. The demand for luxury goods, on the other hand, rises more steeply than the rise in income. This distinction is known as Engel's law.

to which in this society there is no shortage of any sort; i.e., the economic system can give everybody all his needs and desires, not only the essential ones.

The differentiation I choose to establish between necessary products and unnecessary ones is as follows. A **necessary product** is any merchandise or service (essential or luxurious) which, in a case of shortage, some consumers will feel its absence. An **unnecessary product** is a commodity or service which, when in shortage, almost no consumer will feel its absence. Examples of unnecessary products will be discussed below. A prosperous society, according to my definition, is a society which can provide consumers with all the products they feel they need, whether these products are essential or luxurious goods.

5. Work as a Necessary Product

In a prosperous society, one of the things that a citizen relies on the government to provide him with, along with clean air, transportation infrastructure, schools, hospitals, and personal security, is a job. Research in positive psychology has shown that, on the average, the happiness level of unemployed people is remarkably lower than that of the workers. A jobless person who cannot find work feels inferior and useless even if he receives a decent unemployment allowance which allows for a reasonable standard of living (Winkelmann, 2014). Work endows the worker with satisfaction and interest, pride and a feeling of fulfillment, social connections and a sense of attachment to his colleagues and to the organization. Unemployment takes a heavy toll on a person's self-image, life satisfaction, social status and the way he is perceived by society.

In the 2012 USA presidential race both candidates, Barack Obama and Mitt Romney, challenged each other on the question of who was likely to produce more jobs if he won (Kessler, 2012). The expression they used was *job creation*, namely, creating jobs even if these jobs were not required for any purpose other than reducing unemployment. In the 2016 campaign the issue was raised again by Hillary Clinton who spoke about "jobs, jobs and more jobs" (Porter, 2016). One of the main goals of any government is to keep unemployment low. Failure in achieving this goal casts doubt on the status of the country as a prosperous society. This is because, in a prosperous society, a workplace becomes a necessary product and shortage in jobs is equivalent to shortage in any other necessary product.

Maintaining a high level of employment is not an easy task due to a paradox pertaining to the very nature of capitalism. The mission of creating jobs and keeping unemployment low conflicts with two other aspects of capitalist economy:

1. Free competition among producers is maintained, inter alia, by legislation against monopolies and cartels, in order to minimize the prices of goods.

2. Technological advances and automation are widely employed in order to reduce costs and increase productivity.[8]

These two features are intertwined. The competition impels the producer to seek ways to streamline production, and using technology is the principal way to raise productivity and reduce costs. However, as automation increases more and more, workers become redundant and unemployment increases as well. The most salient example is in food production. A century ago more than half of the workforce in the Western world was engaged in agriculture. Thanks to tractors, combines, irrigation systems, fertilizers, pest control and other innovations, the productivity of agriculture has increased dramatically. The rate of workers in agriculture in developed countries nowadays is about 1-3 percent. In Sweden, the agrarian sector is 1.1% of the workforce and supplies more than 80% of the food consumption. In Britain, the rate is 1.4% and in Canada 2.0%. In Turkey, the agrarian sector constitutes nearly 30% and in China more than 40%.[9] Actually, the size of the agricultural sector is used as a measure for the degree of economic development. The lower the rate, the more the country is considered developed.

What happened to the redundant workers when the employment in agriculture dropped, for instance, from 50% to 2%? Experience showed that most of them found work in other sectors. A useful model in employment theory divides the occupation branches into four sectors.[10] Agriculture and the extraction of raw materials (primary), industry (secondary), administration and services (tertiary), research and technological development, R&D or RTD (quaternary). Modernization continuously shifts the center of economic activity from the primary, through the secondary and finally to the tertiary and quaternary sectors.

Thus, when the labor force in agriculture diminished, the dismissed workers moved on to the secondary sector, some of them to jobs directly connected to agriculture, such as tractor plants and fertilizer companies, and some to other occupations. However, during the last decades the industrial sector has undergone a similar process of automation, while smart machines have substituted for human workers at the assembly lines. Mass production of clothes, furniture and other goods are now being manufactured in computerized factories with a minimal number of human workers.

[8] Consumers and producers do not benefit equally from these two aspects of capitalism. The competition among producers is mainly beneficial to the consumers. Using technology to improve production is initially beneficial to the producers, and only later, as a result of competition, spills over to the consumers.

[9] The data were taken from the site of the UN Food and Agriculture Organization (retrieved 1.3.2016) http://www.fao.org/home/en/

[10] The model, initially with three sectors, was proposed by Alan Fisher (1939) and elaborated on by Colin Clark and Jean Fourastié.

Consequently, the secondary sector has diminished as well, while the tertiary and quaternary sectors have expanded. For example, in 1993, 4% of the manpower in Britain worked in the primary sector, 29% in the second and 67% in the third and fourth sectors. In 2012, the numbers were: 1% in the primary sector, 23% in the second and 76% in the third and fourth. In other developed countries, the trend was similar: in 2012, about 75% of the workers in the USA and Sweden worked in the third and fourth sectors, and in Japan and Germany about 70%.[11]

The contraction of the second sector in developed countries is partly due to the relocation of industrial plants to developing countries. For example, in China, the second sector encompassed over 40 percent of the workforce in 2012 and most of its production went to export. However, taking a global view, the overall trend since the beginning of the twentieth century is a decrease in the first two sectors and an increase in the third and fourth. Unfortunately, the threat of dismissal from workplaces because of automation does not spare the two elite sectors. Computers are steadily replacing human staff in banks, public and private offices, law firms, accounting and other white collar vocations. An increasing share of retail commerce has shifted to internet shops, and the robotic car might, in the near future, add taxi drivers and truckers to the unemployed (Halleck 2015). Theoretically, technological progress that makes it possible to satisfy all the needs of the society with less manpower should be welcome, but the rules of the game in the capitalist economy turn the blessing into a curse.

6. The Curse of Automation: Technological Unemployment

In 1933, Keynes coined the term "technological unemployment" for the loss of jobs caused by technological advance. Keynes was optimistic and maintained that this was a temporary problem and, eventually, automation would be greatly beneficial for civilization:

> For the moment the very rapidity of these changes is hurting us and bringing difficult problems to solve. ... We are being afflicted with a new disease of which some readers may not yet have heard the name, but of which they will hear a great deal in the years to come – namely, *technological unemployment.* This means unemployment due to our discovery of means of economising the use of labour outrunning the pace at which we can find new uses for labour. But this is only a temporary phase of maladjustment. All this means in the long run *that mankind is solving its economic problem.* (Keynes, 1933, end of Ch. 1)

[11] The data are from the 2015 Labour Force Survey of the Office for National Statistics, UK (retrieved 1.3.2016) http://www.ons.gov.uk/ons/index.html

After this paragraph follows the optimistic paragraph which was cited in Section 2, on the forthcoming rich society. However, over the years some less optimistic opinions were also voiced (see Woirol, 1996; Bix, 2000). Already in 1821 Ricardo wrote:[12]

> … the discovery and use of machinery may be … injurious to the labouring class.

Among those who opposed Ricardo was his contemporary Jean-Baptiste Say, who declared that production necessarily creates demand, and therefore any commodity that arrives at the market finds a buyer. The arguments about Say's law over the years reflected the difference between those who accepted the law and held that there was no danger of economic crisis due to excess production (thus, technological advance would not not create unemployment) and those who rejected Say's law as a general economic principle.

In the wake of rising unemployment in the 1970s, several renowned economists warned of the danger of technology. They claimed that unlike ordinary machines which replaced muscle power but needed monitoring and maintenance, computers and smart machines reduced the need for the human brain, and made the threat of technological unemployment much more concrete. For instance, Wassily Leontief (1983) wrote that in the past, machines were not able to function "without the guiding hand, the sharp eyes, and the constant attention of alert workers, supervised in their turn by skilled foremen". But nowadays,

> A new wave of technological change, the wave of computerization, automation, and robotization, is rolling in. … the electronic chip is capable of performing more and more complex "mental" functions. … As soon as not only the physical but also the controlling "mental" functions involved in the production of goods and services can be performed without the participation of human labor, labor's role as an indispensable "factor of production" will progressively diminish. (Leontief, 1983).

Paul Samuelson (1989) wrote an article under the heading "Ricardo Was Right!" Several popular books depicted a dark future by claiming that the computer revolution would reduce the demand for many types of professions, such as banking workers (replaced by internet banking), clerks in public and private companies, and production workers in plants replenished by robots. More and more employees would be discharged from workplaces and the inevitable result would be mass unemployment (Aronowitz & Difaziom, 1994; Noble, 1995; Rifkin, 1995).

Various solutions were proposed to solving the problem of technological unemployment, but if the problem is real, these solutions do not appear to be satisfactory. One type of solution is based on

[12] Ricardo wrote this in Ch. 31 (On Machinery), the chapter that was added to the third (and last) edition of his book *On the Principles of Political Economy and Taxation*, which was first published in 1817. He included this after having been persuaded by Malthus that technology could reduce wages and cause unemployment in the long run (Foley, 2008).

welfare payments, e.g. generous unemployment benefits or unconditional basic income paid by the government to everybody. However, as I have already written, the value of a working place is beyond the salary it provides: studies have clearly shown that most people in the working age have to work to be happy. Other proposals called for the expansion of public works, but there is a limit to the amount of employment this solution can provide, for example, after the construction of one railway between two cities there is no need to lay a second rail in parallel. Another proposal called for investing in education so that a larger segment of the population would be able to participate in high-knowledge professions. Indeed, studies have shown that, on the average, employee salary increases, and chances to become unemployed decreases with rising education level (Brynjolfsson & McAfee 2014, p. 135), but one of the claims by those who are concerned by technological unemployment is that the computer has become increasingly sophisticated and can perform assignments that require knowledge and education (Leontief, 1983; Brynjolfsson & McAfee 2014, Ch. 12). Thus, in the long run, the expansion of education will not solve the problem and may even create a class of over-qualified unemployed.

On the other hand, some economists have claimed that no special effort is required to resolve the technological unemployment problem because of spontaneous compensation mechanisms that constantly create new jobs in place of those which have been lost (Antonelli & De Liso, 1997; Pianta & Vivarelli, 2000). For example, when computers replaced human workers in different trades, more workers were needed for the development and maintenance of computer hardware and software. The pessimistic view regarding technological unemployment was nicknamed by its opponents "The Luddite Fallacy."[13]

In the second decade of the 21st century, the pessimistic voices have strengthened. They argue that due to advances in computerization, improved artificial intelligence and the emerging of machine learning (algorithms that improve themselves in the process of working), compensation mechanisms that worked in the past are going to be less effective in the near future for the reasons that Leontief foresaw in 1983. Therefore, high and stable unemployment rates, unknown before, are expected in the coming years (Cowen, 2013; Brynjolfsson & McAfee, 2014; Summers, 2014; Hern, 2014; Economist, 2014; Ford, 2015). According to research which checked many types of professions, about half of the jobs in developed countries can be taken over by computers and sophisticated robots (Frey & Osborne, 2013).

[13] The Luddites were English textile workers who, in the years 1811-1816, led violent acts against the industrialization of their trade which threatened to replace them with unskilled, low-wage laborers. They broke into the factories at night destroying the weaving and knitting machines and sometimes causing loss of life. The term "Luddite Fallacy" implies that the Luddites were wrong because their violence did not halt the industrial revolution and because, in the long run, industrialization led to economic growth, added jobs in many fields and improved the general situation of the population (Pistono, 2012).

The conclusion in these books and articles is that despite the impressive and ongoing growth in the aggregate product due to mechanization and computerization, only part of the population will enjoy the prosperity. The income inequality which increased in the second half of the twentieth century (Piketty, 2013) will continue to grow. About 15 percent of the population will experience economic affluence, due to inherited wealth or to high-paying careers in Hi-Tech, management and top positions in entertainment and sport. The rest will experience periods of unemployment, low wage jobs and financial insecurity as a result of technological unemployment (Autor & Dorn, 2013).

Some studies have portrayed a more balanced picture, in which the reduction of jobs is transitory and a suitable policy can minimize the decrease in existing jobs and speed up the creation of new ones (Vivarelli, 2015). Research on the integration of robots in industrial plants in 17 countries over the years 1993-2007 showed that while robots boosted productivity, they hardly affected the human employment rate, both at higher and lower education levels (Graetz & Michaels, 2015). According to a report by the International Labour Organization (2013), the worldwide rate of unemployment in 2012 was 6% of the workforce, which is close to the natural unemployment rate of 5%,[14] an impressive figure considering the high unemployment that existed in some developed countries at that time.

However, when considering all the data, the inevitable conclusion is that the mechanization and computerization of many professions have a negative impact on the labor market. For example, between 1950 and 1980, the annual increase in the productivity and in the median income in the USA was more or less the same, and amounted to about 90% during 30 years. Between 1980 and 2010, on the other hand, the productivity of the American economy grew by another 90% while the median income rose only by 40% (Frey & Osborne, 2015). A similar conclusion emerges from the comparison between the aggregate product and the number of jobs in the USA: until 2000, the two graphs climbed at approximately the same rate. Between 2000 and 2013, the product rose by about 30% while the number of jobs was constant (Rotman, 2013). The conclusion is that the share of the workers in the national product was reduced. Similar data were found in other developed countries. According to an EU report, the overall rate of unemployment in the EU in mid-2015 was 9.6% (for example, in Germany it was 2.9%, in Greece 25.6% and in Spain 14.0%). The main reasons for this high level of unemployment, according to the report, were the debts of some EU countries, particularly Greece, and the Euro crisis which followed, but other reasons mentioned were globalization and technological progress (Eurostat, 2005).

[14] Natural or normal unemployment is the minimal rate of unemployment in a situation of equilibrium between supply and demand of work. Natural unemployment stems from the fact that part of the labor force is temporarily between works, in search of work, or unable to work.

7. The Fifth Sector as a Solution to Unemployment

As we have seen, technological progress caused a gradual shift of workers between the four occupation sectors. When the first sector shrank, an expansion of the second sector followed, and when the second later contracted, the third and fourth sectors flourished. These transitions involved, inter alia, the emergence of employment branches the production of which had little or no demand in the past. For example, when the first IBM personal computer (PC) appeared in 1981, no one dreamed that its fate would be different from that of the 1970s micro-computer which found limited usage, mainly in academia and industry. However, the PC gradually entered every home and business, and has created a huge number of Hi-Tech jobs in R&D, manufacturing, information security, teaching, marketing etc. A similar process occurred with the cellphone: its fast spread since the mid-1990s and the invention of the smartphone a decade later not only started a revolution in communications but also created millions of jobs worldwide. The internet, the social networks and other modern communication channels that made the world a global village have generated jobs for many workers who had dropped out of other branches. In fact, many inventions of the recent technological revolution have created new domains of occupation.

The computer and the smartphone are examples of products that became needed items. If they disappear from our lives, we shall strongly feel their absence. However, some of the new goods and services can be easily relinquished. If they vanish, only those who made their living in their production and marketing will suffer, while the consumer will not miss them in the least. Examples of such goods and services will be discussed below. Unnecessary products were deemed an annoying phenomenon in the past, and economists talked of them with a certain disdain (Galbraith, 1958, Ch. 12 & 23). However, their contribution to the contemporary problem of technological unemployment should put them in brighter light.

The distinction between necessary and unnecessary products has already been mentioned in Section 4, when discussing the prosperous society. I wish to argue that the most effective solution to the problem of unemployment is increasing the production of unnecessary products. This solution is not new; it has automatically been put into action for thousands of years whenever a society became more efficient and could provide all its needs with fewer workers. When this happened, the surplus employees gradually moved to produce and deliver new goods and services, some of which were not vital to the wellbeing of the society. When the transition from a hunter-gatherer economy to agriculture took place some eleven thousand years ago, and fewer workers could provide all the society's needs, the excess labor force was directed to new areas, such as priesthood, erection of temples and jewelry manufacturing (Diamond, 2002; Barker, 2009). The construction of Stonehenge in the Neolithic age characterized a society that was able to take enough workers out of the production of daily necessities and send them to chisel and drag huge stone pillars to place them in circles. In the Middle Ages,

unemployed youngsters were recruited to build huge cathedrals or participate in needless crusades. Nowadays there are other professions the main goal of which is to engage extra workforce.

It should be taken into account that the process requires time: when there is a change that allows the reduction of the number of employees in essential branches, there is an interim period until the appearance of new products and professions. During this period, unemployment problem may seem intimidating and unsolvable although the solutions are already at hand. The data cited above about the gap between increasing productivity and the standstill of jobs on the one hand, and the median wage, on the other hand, indicate that we are in the midst of such an interim period, which started in the 1980s. But the creation of new jobs is already progressing, and some of these jobs involve redundant products.

It should be re-emphasized that not every new appliance and experience that was deemed unneeded in the past is a redundant product now; consumers have gotten used to various new pleasures and eagerly make them part and parcel of their consumption basket. Cheap flights for vacations, membership in country clubs, state-of-the-art PCs, 70-inch TVs, and many other luxuries are today considered necessary although we could live without them in the past. Therefore the definition of a redundant or unnecessary product is:

An unnecessary product is a commodity or service that, if it is not provided anymore, nobody or almost nobody will miss it.

When checking the structure of the employment market at a given time, it is possible to distinguish between jobs which involve necessary products, and jobs which produce redundant products. Hence the following definition has originated:

A job is defined necessary if it produces necessary products and unnecessary if it produces redundant products.

We can now define a new sector of employment in addition to the previous four sectors, and call it the **fifth** or the **quinary** sector. This sector is the collection of all the unnecessary jobs in the four sectors. It should be noted that there is a model in which there are five sectors instead of four, whilst the fifth sector contains some of the activities that were traditionally included in the fourth. However, we adopt the usual division of four productive sectors, and define the fifth sector as the collection of all the jobs that could be spared without causing suffering or discomfort to the consumer. In the following are some examples of jobs and products of the fifth sector. This list should be updated from time to time since the quinary professions are period-dependent – the solutions of the unemployment problem at a certain time are not necessarily those of previous times.

1. Culture and Entertainment. In most countries, the available sources of culture and entertainment items exceed the demand by far. Usually the consumer has several free or low cost TV channels, hundreds more on cable or satellite TV, and almost unlimited access to programs and series through

the internet. Even if you spend 20 hours a day watching programs, and restrict yourself only to movies, or to romantic series, or to reality shows, you will be able to see only a fraction of the available programs. The same is true for movies in the cinema, books, concerts, exhibitions, lectures and other cultural products. Fans of culture and entertainment over the world are used to the fact that they can consume only a small part of the supply. Actually the production in these domains could have been reduced by considerable percentages without causing a shortage. That is why the 2007/8 strike of 12,000 screenwriters in the United States, which lasted more than three months, has not created a shortage of broadcasted series and programs (NYT, 2008). To conclude, the fields of culture, entertainment, media and communication in developed countries present valuable potential for fifth sector jobs.

2. The Kingdom of Sport. Huge resources are invested annually in competitive sports, as governmental grants, support of institutions and companies, broadcasting contracts and money spent on tickets to sport events. As in the field of culture and entertainment, there is no doubt that sport is an important consumer good, but the volume of events is much larger than the absorption capacity of the consumers. In the 2012 London Olympics, for example, the stadiums in some of the events were half empty (Booth & Gibson, 2012). The same occurrence was observed in Rio in 2016 (Ansari, 2016). The professional and amateur sport empires, with their workers, managers, players and spectators, national and international organizations and companies for sports equipment, are today important sources of employment rather than providers of consumers' necessity.

3. Advertising is another domain whose product is partly quinary. Serious claims were made against some negative aspects of advertising, that makes us spend more than we can afford, consume unnecessary goods and buy unhealthy products such as high-fat foods, sugary drinks, and – in the past – tobacco products (Klein, 1999; Frith & Mueller, 2010). But even if we focus on the positive aspects of advertising, like the transfer of important information to consumers, driving the economy forward and encouraging competition between manufacturers, the amount of advertising that a person in the modern world is exposed to is much beyond what is necessary to achieve these goals. Proof of this is when the advertising of certain products is prohibited (e.g., cigarettes), the public continues to consume them. The cost of maintaining the advertising world, including the tremendous budgets invested in making ads and messages more attractive and efficient, is eventually paid for by the consumer through the price of the product. This money finances a branch of employment that, to a great extent, belongs to the fifth sector.

4. Liberal professions, such as lawyers, psychologists, cosmeticians and aesthetic surgeons also contribute to the fifth sector since the demand for their services is flexible and in a prosperous society, it can expand almost indefinitely. Each prosperous society has its popular liberal professions. In Israel,

for example, there is a special affection for legal services: the number of lawyers per capita is the highest in the world (one lawyer to 140 citizens, compared to 1 to 250 in the United States). The Israelis often turn to courts and to attorneys with matters that could be resolved in other ways (e.g., by downloading contracts from the internet, or settling a dispute by mediation instead of a lawsuit). In certain countries in South America, people frequently visit psychotherapists who are prevalent (one to 120 persons in Argentina) and relatively inexpensive (Romero, 2012).

5. The financial market is the arena of many players: banks, investment companies, stock exchange brokers, investment advisors, and so on. Millions of employees in financial institutions around the world work hard to maximize investor profits, and concurrently – the revenue of their workplace. Public savings are conducted by financial professionals in a multilevel system, from the banker or broker who directly handles our money through investment companies which manipulate sophisticated financial instruments to experts who try to decipher the direction of the market and economics professors who publish mathematical models of investment and return. Within this complex system, there are many jobs that could be eliminated without harming the main goal – transferring money from savers to borrowers and investors (Shutt, 2010; Weber, 2015). It can therefore be said that a large portion of the financial system is basically quinary.

6. Military expenditures. According to a study published by the Stockholm International Peace Research Institute (SIPRI) in 2012, the world spending on military and security purposes fell after the end of the Cold War, but since 1999 is again on the rise, and "the increase has been a global phenomenon, reflected in almost all regions, by countries of all sizes and in most cases unconnected to any obvious increase in security threats." (Perlo-Freeman, 2012). According to the study, allocations to the armed forces, intelligence services and arms industries during peace time in most of the developed countries could be substantially cut. To mention one example, the development costs of the F-35 American fighter skyrocketed to 400 billion dollars in 2015. A few years after the aircrafts go into service they might become outdated, considering the development of unmanned aircrafts (Cohen, 2015). Although its military benefits might be negligible, the F-15 has provided many jobs for the American labor market. The calls to cut military expenses meet firm resistance from the security establishment, and one of the arguments is that any reduction will result in mass layoffs (Levy, 2010). It can be assumed that some of the jobs sponsored by military budgets in peacetime belong to the fifth sector.

7. Scientific research and higher education are two additional domains that participate in the fifth sector. Scientific and technological research is the leading edge of progress and the mainstay of a prosperous society. However, there are branches of high-cost basic research which have little direct impact on the welfare of society. One example is space exploration. The American space agency,

NASA, which was founded in 1958, carried out six manned landings on the moon in the Apollo program during the years 1961-1972. The astronauts took measurements and photographs, and brought to Earth a few hundred kilograms of moon rocks. The direct and indirect costs of the Apollo program are evaluated at 170 billion dollars in 2005 values, and claims were made in the scientific community that the benefits of the project never justified the enormous cost (Compton, 1989). The measurements made on the lunar surface and the rocks brought to Earth have not added much to our knowledge about the moon and the solar system, and the technological advances that the program has yielded (e.g. in the fields of rocket propulsion, electronics and computers) could have been achieved for a much lower price. In 1972, the NASA budget was drastically cut and the Apollo program was terminated before the completion of its planned flights. Additional gradual reduction occurred following the Columbia disaster in February 2003. In fact, since the landing of the Space Shuttle Atlantis in 2011, America had no means of reaching space and NASA satellites have been launched by Russian spaceships costing millions of dollars each launch.

The debate on investments in basic research has been going on for decades. One of its peaks was protests against the construction of the large particle accelerator in Texas (at a cost of about 10 billion dollars) that caused the cancellation of the project in 1993 by the US Congress, after spending more than two billion dollars on planning and groundworks (Weinberg, 1993). The opponents of big money investments in basic science argue that it is better to spend the money on applied research or on poverty reduction. On the other hand, it was argued that investment in basic science is beneficial because, time and time again, basic research has led to important practical discoveries, and the investments are worthy therefore in the long run. In addition to instrumental reasons, ethical reasons, such as the importance of knowledge in forming human philosophy and world view were also used to justify basic research. Another justification that can be made in favor of basic science involves a distinction, on which I will elaborate below, between good and bad quinary jobs. I will argue that basic research is indeed a quinary area, but it is much more beneficial to invest money in this area than in other quinary fields.

Higher education in developed countries has been the subject of similar discussions. The central role of academic institutions in the welfare of a prosperous society is beyond any doubt. It is impossible to imagine a modern society without the engineers, physicians and graduates of natural science, social science and humanities produced by the universities. However, it was argued that academic institutions could achieve their goals more efficiently, and at a lower cost, by reducing nonessential activities (for example, sports that has become a major industry in American colleges), and by using innovative educational technology in a larger portion of the courses, instead of frontal teaching (Craig, 2015; Carey, 2015). As in the case of the basic research, the answer is that many jobs in higher education are indeed quinary, but they are "good" quinary jobs that should be supported.

8. The cost of democracy

In the representative democracy which prevails in the Western world, there are inherent phenomena of inefficiency and waste, e.g., subsidizing two groups of parliament members, a majority group and an opposition group, whose quarrels often thwart efforts to maintain functioning ruling. This dualism is apparently inevitable, but there are expenses that could be reduced, such as the high costs of election propaganda. For example, the estimated cost of the 2012 US presidential race between Barack Obama and Mitt Romney was some two billion dollars, collected by crowdfunding and traditional donations (Braun & Gillum, 2012). The two candidates could present their attitudes to the public with a tenth of this sum. However, the money financed thousands of quinary jobs of advertising agencies, public relation experts and technical workers for months.

9. The price of Capitalism

The free market competition which is a basic principle of capitalism contributes to the fifth sector as well. The purposes of the competition are to enhance the efficiency of the production process and to reduce the prices of goods. However, competition often pushes the prices up because the development, manufacturing, and marketing of the products are done independently by several companies. The good news is that it creates quinary jobs and reduces unemployment.

An even greater contributor to the fifth sector is excessive consumption - another characteristic of capitalism. I do not mean only unnecessary or quinary products but also necessary items which are often over-produced and over-consumed. We buy more than we need; we frequently buy a new artifact while the old one is still useable, or buy things and never use them. The capitalist culture of consumption has its dark sides, yet it plays a key role in improving economic conditions and reducing unemployment.

When the culture of consumption demanded to replace the old record player by the CD player, the video recorder by the DVD and the film camera by the digital camera, it made sense as the new devices were more sophisticated and efficient than the old ones. But why should we buy new clothes and new furniture, and throw away the old ones while they are still usable? What prevents us from using our clothes and furniture over and over as long as they are not worn out? Galbraith wrote in 1958 that the main goal of increasing production had changed. Instead of providing consumers with the products they need, it became a tool for ameliorating unemployment, bankruptcy of businesses and financial troubles (Galbraith, 1958, Cp. 13). Today we know that enhanced production causes environment pollution, demolishes vital natural resources and contributes to global warming, but it is deemed to be crucial for sustaining a modern economy.

The comedian Jerry Seinfeld, in a stand-up show, talked about the culture of consumption. He said that once we buy a new thing, it immediately becomes rubbish. The fate of everything we buy is to be thrown in the garbage. Until that happens, it will gather dust in the corner of the room, then will be demoted to be stored in the basement and then thrown away. When the garbage trucker passes through a neighborhood, he sees people returning from shopping with their bags and tells himself that soon he will see what they have. This comic passage reflects the wasteful rate of consumption in a prosperous society more than a volume of academic researches.

8. The fifth sector and the prosperous economy

We have defined the fifth, or quinary, sector as a collection of all redundant jobs. These jobs are redundant in the sense that if they are eliminated or reduced, consumers will not miss their products. For example, terminating the landings on the moon has not caused mass street protests in the United States or in other countries. Similarly, a considerable reduction in the production of movies, entertainment programs and books will not create a serious shortage among consumers. However, the fifth sector is essential to the economy because quinary jobs are ideal solutions to the problem of technological unemployment, and a counterweight to the takeover of computers and robots of more and more human jobs.

In the past, the term "unnecessary jobs" carried negative connotations. Thorstein Veblen (1899) referred contemptuously to the "leisure class'" engagement in intellectual and artistic activity, or in purposeless high studies, instead of undertaking productive work. John Kenneth Galbraith wrote sarcastically about "the new class" that replaced physical work with "mental, artistic or managerial work" (Galbraith, 1958. Ch. 24),[15] and expressed his discontent of the overgrown governmental and public sectors in the United States, e.g. in the State Department and in the military sectors, including the Pentagon, the armed forces, and the arms industries (Galbraith, 1992, ch. 9-11).

[15] Galbraith's New Class is not identical with the fifth sector because it includes essential professions, such as physicians, teachers and CEOs along with quinary professions, such as artists, writers and philosophers. According to Galbraith's definition, the New Class is the collection of occupations that are not involved in arduous or boring work, have high social status, and provide the worker with a feeling of fulfillment and satisfaction. Galbraith's cynicism towards the New Class which "thousands join every year while virtually no one leaves it" (1958, p. 267) was undoubtedly directed to the quinary part of this class, although Galbraith did not make an explicit distinction between the segment we call quinary, and the productive segment.
The term New Class appears in the scientific and ideological literature in two more prominent contexts. In 1957, a year before Galbraith wrote about the American New Class, the Yugoslav dissident Milovan Djilas published his book *The New Class: An Analysis of the Communist System* (Djilas, 1957), which criticized the special privileges of party members and functionaries in the communist bloc. In the 1970s, the term New Class re-emerged in the writings of American neoconservatives carrying a leftish political stigma. It referred to educated people in academia, the media, liberal professions and the governmental administration which resisted the Vietnam War, and supported the reduction of income inequality, legislation against air-pollution, limitations on weapon sales, car safety accessories (such as airbags) and similar initiatives that imposed restrictions on the industry and the free market (Bruce-Briggs, 1979). None of these uses of the term *new class* matches the definition of the quinary sector in the present article.

In the 21st century, the attitude towards this issue should be completely different. We have to accept the fifth sector as an integral part of our modern economic and social systems. The fifth sector has existed in the past, as proven by sites such as Stonehenge, but its weight in today's Western economy is much greater. It should be remembered that during most of human history, more than 90% of the people were farmers and craftsmen, and only a small percentage were administrators, priests, artists and philosophers (Harari, 2014). Since the beginning of the industrial revolution in the 18th century (e.g., since the invention of the steam machine by James Watt in 1774), this ratio has gradually been changing in favor of the fifth sector. Within a few decades, the ratio might be reversed: 10% of the workers will be employed in the four productive sectors, assisted by an army of robots and computers, and 90% will be engaged in the fifth sector.

The fifth sector provides work for highly educated workers as well as for blue-collar workers, such as, cosmeticians, hairdressers and production workers. It not only creates jobs but also consumers. Employed people spend more money on services and supplies than the unemployed, and therefore each quinary job supports additional jobs in the productive sectors. Cutting down the fifth sector for reasons of efficiency and saving public money might trigger a recession. Moreover, in addition to practical reasons, the quinary jobs make our society what it is: a civilization which nurtures culture, entertainment, science and creativity, and offers its associates a variety of choices for self-realization. It can be said that the existence of the fifth sector is largely responsible for the feeling of wellbeing in a prosperous society.

The argument can be overturned – instead of seeing the fifth sector as a forced solution to the problem of technological unemployment, one can welcome the reduction of jobs caused by the technological revolution and consider it a constructive process which liberates humanity from hard and boring toil. Instead of lifting heavy loads, sitting on a tractor in the heat of the summer or adding up long series of numbers, a growing part of modern society can spend time in creative and pleasant activities, such as scientific research, writing plays or learning new subjects. The enlargement of the fifth sector can be perceived as a fulfillment of an old dream: the liberation of mankind from the burden of hard and exhausting work, and making daily work an enjoyable task. In September 2015, the Bloomberg news site reported that the Japanese government had decided to support the development of robots for various tasks in order to cope with the Japanese aging populace, shrinking workforce and public aversion to immigration, and to liberate human workers from hard or hazardous tasks. "Japan is not afraid of robots" said Prime Minister Shinzo Abe when his government announced a five-year plan to deepen the use of intelligent machines in manufacturing, supply chains, construction and health care while expanding the robotics markets from ¥660 billion to ¥2.4 trillion by 2020 (Nohara, 2015).

9. Good and Bad Quinary Jobs

Although the fifth sector is, in principle, a positive phenomenon, one can distinguish between good and bad quinary jobs in terms of their economic, social, and environmental influences. For example, the excessive production which leads to the "buy and dump" consumer culture is harmful since it causes wasting of natural resources, pollution, and enhancement of global warming. Scientific research and higher education can be classified as "good" quinary domains for several reasons. Pure research often produces useful byproducts; experienced researchers in this field can move relatively easily to applied R&D; universities and research institutions nurture education and knowledge which are valuable for a healthy society. Another example of a good quinary domain is the field of art and culture which is characterized by a frugal use of natural resources and reflects the desire of humanity for the sublime and inspiring.

Theoretical and experimental research of the fifth sector should be encouraged and promoted. The research should first focus on identifying the extent and limits of the fifth sector in various countries, and second, on characterizing the special features of various quinary domains. The next step is to analyze the relative benefit to the society of various quinary jobs in order to find out which should be supported and nurtured. Another important objective of the research is related to regulation and balance. It is important to constantly regulate the fifth sector so that it is not too big or not too small in order to keep the balance between this sector and the productive sectors. If the fifth sector becomes too small, it may increase unemployment. When it is too large, it may cause a shortage of workers in the productive sectors and increase government deficit. Achieving this balance and preserving it is one of the most important challenges of a prosperous society. One of the causes of the 2012 economic crisis in Greece that took the Eurozone by surprise was the bloated public sector which reached up to 40 percent of the workforce and enjoyed retirement at the age of 55 with generous pensions (Daley, 2015).

An interesting example of control of the fifth sector is the fluctuation in Swedish economic policy. Since the 1930s, Sweden has developed a socio-economic model that was unique in the capitalist world. It was based on an advanced welfare scheme, public housing for needy families, and high-level egalitarian education and health systems. This model was funded by high taxes and by the way, assured a high level of employment by maintaining a large governmental sector for dealing with welfare, education and health. In the 1990s, the Swedish government began to cut public spending and to change the "Swedish model" because the balance between the fifth sector and the productive sectors was violated, and it was clear that the welfare payments, generous unemployment allowance and high pensions could not go on forever without deteriorating the government budget to deficit. As a result of the cutbacks, unemployment increased and job security decreased, but economic stability improved. After the victory of the Social Democratic Party headed by Stefan Löfven in September 2014, Sweden

did not return to the 20th century model, although the government promised to increase the budget for initiated public works and for the health and educational systems (Löfven, 2014).

Disproportion between the fifth sector and the productive sectors can be fatal. In his book *Collapse*, Professor Jared Diamond from UCLA analyzes the reasons that certain civilizations have managed to survive for millennia while others have collapsed or decayed (Diamond, 2005). An example of a civilization which collapsed is the society that thrived on Easter Island in the Pacific during the 16th and 17th centuries and, along its shores, erected hundreds of monumental stone statues. The population at its peak, in the early 17th century, is estimated at about 15,000 inhabitants. The collapse was accompanied by a depletion of food sources, starvation and cannibalism, and when the first Europeans came to the island in 1722, the population amounted to less than 3,000 sick and starving residents. There are several theories about the reasons for the calamity. According to Diamond, the main reason was the enormous resources which were invested in building the statues at the expense of the basic needs of the islanders. In the terms of the present article, we would say that the *fifth sector* in Easter Island grew out of proportion, causing the devastation of the society. According to Diamond's book, this can happen not only in primitive societies, such as on Easter Island, but in modern industrial societies as well.

Spotting the imbalance between the fifth sector and the productive sectors is not always easy. Suppose that due to the worsening of the security situation in a country, more policemen and security guards are recruited, and there is a growing demand for protective measures and self-defense courses. All this increases the GNP, and apparently economic activity goes up and unemployment decreases. But the resources directed to security are taken from productive sectors, such as industry, agriculture and building. Therefore, despite the increase in the National Product and the decrease in unemployment, the imbalance between the various economic sectors reduces welfare and shakes the economic stability of the society.

Controlling the size of the fifth sector can be done by budget restrictions, as took place in Sweden or by other measures. For example, in 2015, the Israel Minister of Justice, Ayelet Shaked, announced that the period of internship for new lawyers was to be doubled, from one to two years, in order to decelerate the growth of the sector. It should be noted that the division between necessary and redundant jobs is statistical. If we reach the conclusion that 30% of the lawyers in a country belong to the quinary sector, we usually will not be able to say whether the job of a specific person is necessary, redundant, or partly redundant. The statistic refers to the whole sector.

10. The Mechanisms by which Quinary Jobs are Created

How are quinary jobs created? Two main mechanisms are responsible for the creation of these jobs and their regulation. One mechanism is connected to the free market and private initiatives while the other is activated by governmental policy and decisions. Both mechanisms operate simultaneously and assist each other.

The free market mechanism creates quinary jobs spontaneously, whenever the manufacturing of some product becomes more efficient, and the goods required by the consumers can be supplied with less manpower. We can imagine its appearance at the dawn of history when a Neolithic artist discovered that since the daily catch of his fellow-hunters exceeded expectations, he could devote his time to making stone ornaments, and trade them for meat.

The same mechanism of supply and demand of superfluous products exists today as well. Let's suppose that in a certain industrial branch, e.g. the car industry, human workers are widely replaced by robots. It can be presumed that the cost of the robot work – considering the development, manufacturing and maintenance of the robots – is cheaper than human work (otherwise it wouldn't be profitable to use robots). Therefore, as a result of bringing the robots in, the number of human workers diminishes and, at the same time, the production cost per car is reduced. The reduction of costs could result in three outcomes: reducing the price of the car for consumers, raising the wages of the workers that have not been fired, and increasing the dividend for the shareholders. Sometimes all three groups, consumers, workers and shareholders, will profit while, in other cases, only one or two of the groups will benefit.[16] In any case, some people will have more money in their pocket at the end of the month, and since we are talking about a prosperous society where most of the essential needs of the population have been supplied, at least some of the extra money might be spent on quinary products. Thus, the fact that some people connected to the car industry became a bit wealthier may increase the demand for quinary workers. On the other hand, the fired workers will increase the number of jobseekers in the market and some of them will manage to start a new career in quinary fields.

One may ask, why would people spend money on unnecessary stuff? The answer is – because they have excess money. Once you have everything you need, including enough savings to secure the future of your family, keeping money in your pocket instead of spending it makes the money worthless. Burying money under the floorboards forever is equivalent to throwing it away. In addition, the choice of quinary products and services is enticing and presents a temptation which is hard to

[16] The wage of the remaining worker will increase if they are the skilled workers in charge of the maintenance of the robots, and who now possess a substantial bargaining power over the employer. However, it could happen that only the low salary workers remain because it is unprofitable to replace them by robots. It is also possible that because there are more jobseekers in the entire industry, there will be less demand for workers and the wages will go down.

resist, especially when accompanied by aggressive advertising and marketing. Who among us has not been tempted to buy a garment which, after being worn on one occasion, was put in the closet and stayed there, or purchase a book which remained unread, or pay an unjustified price for boring entertainment or an unpalatable meal at a restaurant where the dishes are small and expensive? People pay thousands of dollars on luxury watches that operate no better than a cheaper watch, and buy designer clothes and pricey footwear, believing they have received full value for their money.

In Section Four, I mentioned Keynes' saying about absolute needs which are necessary in any situation, and relative needs whose main purpose is to make us feel superior to our colleagues. In fact, the purposes of the second type are much more diverse than just to provoke envy. They make us feel lucky and successful, and please us whenever we recall them. These feelings are well-exploited in advertisements for luxury products that often use sentences like "you can afford it!" or "it's time to treat yourself!" Studies have shown that the acquisition of luxurious goods make most people more happy than buying necessary items (Arnold & Reynolds, 2003).

It should be re-emphasized that the automation process enhances general wealth although not all workers enjoy it equally (Brynjolfsson & McAfee 2014). As the average standard of living in the society increases due to automation, part of the growth is manifested in the consumption of quinary goods and services. The higher the level of affluence of the society, the greater the proportion of quinary products in daily life, since the consumption of essential goods and services is already close to saturation.

Some quinary goods and services are offered not by workers which were dismissed from the productive sectors, but rather by people who initially chose to work in the quinary sector, or moved to it in order to express their creativity and fulfill a dream. I once met a man who had worked as an engineer in the aerospace industry, and at the age of 50 retired and established an institute for teaching a spiritual discipline called "Yemima's Method".[17] The project became quite successful and provided employment for numerous lecturers. The enthusiasm of such entrepreneurs often grips the potential consumers and creates a demand for new quinary products which did not exist in the past. This is another reason why people are often moved to consume quinary products instead of increasing their savings.[18]

[17] Yemima Avital (b.1929, Casablanca–d.1999, Tel Aviv) was a spiritual teacher who shared her teachings through lessons and lectures. Her students continue to teach her principles under the name *Yemima Method* (Kauffman, 2012).

[18] When discussing saving as an alternative to spending, we have to remember two things. First, saving can be regarded as delayed spending because the saved money will be used for consumption in the future, by the saver or his successors. Second, even in the short term, part of that money goes to consumption. If it is deposited in the bank, the bank can loan it to someone who will spend it right away. If it is invested in the bonds or stocks of commercial companies, the money will be spent to buy equipment or raw materials which is also a type of

The second mechanism for creating quinary jobs is controlled by the government in a variety of direct and indirect ways: increasing governmental administration; creating new units to improve services to the citizens; supporting culture, sport and higher education; investing in pure research projects like space exploration; reducing taxes to increase consumption; introducing monetary steps, such as lowering interest rates and financing cheap loans, etc.

Success at curbing unemployment is one of the most important goals of any rule. If the US President wishes to be elected to a second term, or if she is already in her second term and desires to be remembered as a successful President, while assisting her party candidate to win the next election, she should do her best to keep unemployment rates below the natural rate of five percent during most of her term. Higher unemployment rates may be considered a failure of the President and the presidential administration. The same is true for any Head of State elected in democratic elections who does not wish to disappoint his voters. The struggle with technological unemployment requires constant creative thinking in order to find ways to add new jobs instead of those which have been cancelled. The fifth domain with its various sub-sectors can supply useful solutions.

Public work for the unemployed which was applied in Israel to cope with the mass immigration of the 1950s (relief works) was a practical although not an ideal solution, since they consisted of unwanted and unnecessary jobs, such as rocks clearing and planting trees (Maryoma-Marom, 1970). Roosevelt's New Deal in the 1930s was a better solution because it was based on national projects, like the Hoover Dam which, when completed, had important economic value and became productive rather than quinary projects (Leuchtenburg, 1963). Good quinary jobs should look prestigious and necessary, rather than poor and redundant. However, where there is no other choice relief works are better than no work at all, as Keynes (1936, ch. 10) wittily put it:

> If the Treasury were to fill old bottles with banknotes, bury them at suitable depths in disused coalmines which are then filled up to the surface with town rubbish, and leave it to private enterprise on well-tried principles of *laissez-faire* to dig the notes up again … there need be no more unemployment and, with the help of the repercussions, the real income of the community, and its capital wealth also, would probably become a good deal greater than it actually is. It would, indeed, be more sensible to build houses and the like; but if there are political and practical difficulties in the way of this, the above would be better than nothing.

Keynes's proposal intended to achieve two goals. First, this kind of work, although undignified, allows the unemployed to get out and do something. Second, when the money in the bottles gets into circulation and is used for consumption, it is going to enhance production and grease the wheels of the

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consumption. Therefore it can be assumed that when the quantity of money in the market grows, in one way or another, most of the increase will be spent on consumption.

economy. Keynes's proposal is of course sarcastic – it would be better, as Keynes himself wrote, to use the money to construct houses and infrastructures – but it underscores an important point: every financial investment by the government, for any purpose, may be beneficial in fighting unemployment and recession, although constructive works are better than digging up money bottles. It should be noted that Keynes' proposal referred to the 1930s deep recession and not to the problem of technological unemployment in the prosperous society. However, Keynes' money bottle digging is a beautiful example of a job which is totally quinary, yet can be helpful in solving economic ills.A newer version of Keynes' "money bottles" is called "helicopter money". The term was coined by Milton Friedman in his1969 essay "The Optimum Quantity of Money". Friedman suggested to boost an economy through dropping money on the citizens, and used the allegory of a helicopter dropping bills from the sky. However, Friedman's model includes only one of Keynes's two goals. It enhances the consumption but it does not provide employment.

Each of the two mechanisms, the spontaneous mechanism of the free market, and the top-down governmental mechanism, has its advantages and weaknesses. The governmental mechanism is relatively fast in creating quinary jobs and can be operated almost instantly. The spontaneous mechanism, on the other hand, is slower since the passage of workers to new occupational fields takes time, and consumers need time to get used to new quinary products.

The advantage of the spontaneous mechanism becomes apparent when it is necessary to reduce the quinary sector because it outbalances the productive sectors. For instance, when the demand for workers in the productive sectors increases, or when the fifth sector gets too large and becomes a burden, or when a recession starts and the demand is reduced for products in general and for quinary products in particular. In all these cases, the free market which can be quite slow in creating quinary jobs becomes quick and efficient in eliminating them. It adjusts itself promptly to the new situation by ejecting part of the quinary workers, and lets them rely on unemployment allowance until they find a new job. This is an integral part of the capitalist prosperity: flourishing fields, such as advertising, have to shrink once in a while, and their workers which have enjoyed convenient and satisfying creative work and high salaries become unemployed.

For the governmental mechanism, it is more difficult to reduce the quinary sector when this is required, and sometimes it is also hard to enact laws that facilitate the mobility of workers in the public and private sectors. When in January 2015 Alexis Tsipras, the leader of the left-wing Syriza party, became the Prime Minister of Greece, he tried to reconcile the promises he had given to his voters with the austerity measures demanded by the EU as a condition for financial aid. Very quickly it became clear that unpopular steps like cutting worker benefits, raising taxes, restraining the power of the money oligarchy and reducing the inefficient and inflated public sector are very difficult to

implement. In 2006 and 2007 waves of protests and strikes shook France, following attempts of right-wing governments to improve the economy by facilitating the firing of young workers in the first two years of their career (USA Today, 2006), and by reducing the pension rights of half a million employees in the public service (Bennhold, 2007). The protests and strikes forced the government to cancel part of the planned changes.

It should be emphasized that the economics of the "good" quinary jobs (as opposed to relief works) is controlled by the same strict laws of supply and demand, competition and achievement as general labor economics. As in the productive sectors, quinary jobs are not easily attained. Many candidates might fight for a coveted quinary job, each of them highlighting his or her accomplishments and suitability for the role. The need to excel and to display talent and ability exists in the quinary sector even more than in other sectors. Young people who wish to pursue a career as opera singers or news reporters have to compete with many other candidates who desire the same jobs. A filmmaker whose movies neither attract the public nor win prizes in notable festivals will not be able to get funds for future projects. An artist whose paintings do not receive the critics' appreciation and are not sold will probably have to look for another job. This is one of the reasons why it is sometimes difficult to distinguish between quinary jobs and ordinary jobs. It is much easier to distinguish between ordinary jobs and relief works where there is no need for special talents and no competition on the cup of "the best relief worker." Good quinary jobs provide not only salaries and job satisfaction but also make the workers proud of their success in the capitalist struggle for survival.

11. Summation and Conclusions

The quinary sector which includes all the redundant jobs and supplies a variety of unnecessary goods and services has become an integral part of the modern economy. Advances in computing, robotics and mechanization of production has gradually increased its share in the labor market: if two hundred years ago, it encompassed one tenth of the workers, the ratio may sooner or later be overturned, and one-tenth of the workforce – assisted by an army of robots and computers – will be able to produce everything that is necessary for mankind. The concern that ninety percent of the workforce will be at risk of unemployment is, of course, absurd. Today, the threat of "technological unemployment" is contained by the growing fifth sector, and the demand for innovative quinary products guarantees that this sector will continue to be an inexhaustible source of employment. In the past, notable economists, such as Veblen and Galbraith, treated this sector with suspicion and disapproval, although they did not accurately define its scope and structure nor did they discuss its constructive role in the economy of the satiated world. It is time to change our thinking and refer to the quinary sector as an integral and positive part of the economy of the present and the future.

Since the same laws of demand and supply which exist in the productive sectors apply in the fifth sector as well, and since its contribution to the GDP is indistinguishable from that of the other sectors, the difference between the fifth sector and the other sectors should not, allegedly, play any economic role, or have any economic significance. However, the fact that the demand for quinary products is flexible and their removal from the market will not create a shortage makes them an effective instrument for restraining economic fluctuations. In recession times, they are a protective layer that can be waived without damaging the production of essential products. On the other hand, the fifth sector is an unrivalled means in the long-term struggle with technological unemployment.

Understanding the uniqueness and importance of the fifth sector can change economic thought. For example, it may cast doubt on the principle whereby efficiency is the ultimate criterion – or a very important one – in the assessment of an economic unit. If in a government department or in a public or private organization some employees can be fired without demoting the functioning of the unit (hidden unemployment), the overall far-sighted view might be that firing is not necessarily the right thing to do. If the society will have to create new quinary jobs for these fired workers, maybe it is better not to fire them right away and rather subsidize the hidden unemployment. On the other hand, long-term hidden unemployment can burrow under the foundation of the organization and undermine it.[19] Therefore, the study of the positive and negative aspects of the quinary sector, and its impact on the criteria for evaluating organizations and institutions, is one of the urgent tasks of the economic research of a prosperous society.

A revision is needed in the consumer theory as well. What is the point in hunting for the cheapest product, if you then use the saved money to buy another item which you do not really need, just in order to spend the money? Indeed, the theory according to which the consumer always aspires to get the cheapest product or commodity bundle is obsolete dogma which does not reflect the reality of a prosperous society and needs to be refreshed (see note 5 on "the indifference curve"). Another important role of the study of the quinary sector is to examine the influence of various quinary branches on the welfare of the society, as we did in Section 9 by comparing "good" and "bad" quinary fields.

It was mentioned in Section 6 that the concern about deep and widespread technological unemployment is salient in books and articles in the second decade of the 21st century. In light of the expansion potential of the fifth sector, this concern seems undue. In a democratic system that characterizes a prosperous society, the voters have the power to force the government to invest efforts

[19] One has to distinguish between two cases. (a) Hidden unemployment that involves inefficiency and inactive workers. (b) Avoiding layoffs by expanding the workers job definition and imposing additional tasks on them. The first phenomenon is bad in any situation. The second may be tolerable even if the additional tasks are quinary.

and resources in solving irksome problems. Technological unemployment is a problem that can be solved, and it is the economist's duty to offer appropriate solutions. In the absence of planned solutions, unwanted solutions may appear, for example, crime will spread and it will be necessary to have more policemen, judges and lawyers, and there will be more poor people which will require more social workers.

The economic problems of a prosperous society are different from those which society faced in the past.Classic economic theory was formulated when the main economic problem was shortage. In the prosperous society of today, the shortage problem is resolved, and the relationship between technology, unemployment and the quinary sectors becomes one of the most interesting and important problems (along with economic inequality and environmental problems) that should be tackled.

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