
Niels Bohr's Principle of Complementarities in Political Economy

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Abstract:

The development of the principle of complementarity by a well-known Danish physical scientist N. Bohr was the outstanding achievement of philosophical idea, having prime value to explain quantum mechanics phenomena and biological and social (including economic) phenomena sufficiently differing from them. This principle focuses the attention of the researchers on revelation of dualistic, dialectically contradictory essence of the phenomenon studied. Such task cannot be solved using some single category whatever significant and universal it is. Three categories shall be used for this. One for designation of a basic phenomenon per se, two others to describe additional properties, revealing dualistic, dialectically contradictory essence of the phenomenon studied. Such approach allows developing the required theoretic and methodological tools to study dualistic, contradictory nature of economic phenomena and processes as a two-pole model of the economic phenomenon (ABC model), embodying the principle of complementarity in political economy. This model may be used as a tool for critical analysis of conceptual framework of economics and development of scientific novelty. The article shows that theoretic interpretation of many economic phenomena has stood the test from ABC model position, some of them could not overcome such a test. These are, for example: nominal salary, labour productivity, marketing and advertising. Analysis using ABC model revealed that their widespread theoretical interpretations ignore the essential characteristics of these phenomena. The principle of complementarity which fixed inherent dualistic dialectically contradictory structure as the required step of cognition of nature and society phenomena essence plays the most important methodological role in the analysis of economic phenomena.

Key Words: *Duality of Economic Phenomena, Principle of Complementarity, Niels Bohr, Three-Tier Rule, ABC Two-Pole Model of Economic Phenomenon, Principle of Complementarity in Political Economy*

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1. Introduction

The development of the principle of complementarity in the 20-s of the twentieth century by the outstanding Danish physical scientist, Nobel laureate Niels Bohr (1885-1962), to explain quantum mechanics phenomena was a convincing demonstration of exceptional cognitive abilities of dialectical research method. Experimental physical scientists investigating quantum objects faced apparently conflicting results: these objects manifested themselves both as corpuscles and as waves. “The idea of a photon with all its fruitfulness, - Niels Bohr wrote in this regard, - issued completely unforeseen dilemma, since any corpuscular radiation pattern is clearly incompatible with interference phenomena, which represent an important feature of radiation processes and can be described only by means of the wave pattern” (Bohr, 1958, 34).

By studying this kind of contradictions, N. Bohr concluded that these experimental data in fact not exclude but complement each other, characterizing objectively existing properties of quantum phenomena. According to the principle of complementarity, data obtained under different experimental conditions cannot be covered by a single pattern; these data shall be regarded rather as *complementary* in the sense that only the aggregate of various phenomena may provide more complete picture of object properties (Bohr 1949).

Relying on the principle of complementarity, as a general philosophic regularity, N. Bohr stated a thesis that “opposites are complementary”, i.e. that the unity of opposites is an indispensable additional characteristic of the phenomenon of nature and society which the researcher reaches as soon as he gets into their essence. “... In cognitive process, to reproduce object integrity, as explained by A. Pozner, one shall use mutually exclusive “additional classes of categories, each applicable under their specific conditions” (Pozner, 1962, 52).

2. Three – Tier Rule

In terminology, this means that intrinsic nature of the phenomena studied, in principle cannot be expressed by a single category whatever significant and universal it is. At least three categories are required to solve this task. It is a kind of Three-Tier Rule. One category is required to describe the phenomenon per se (so to say, the basic phenomenon), not reducible to any of its inherent features, and the other two additional categories are needed to express its dualistic internally contradictory essence.

Niels Bohr, facing the fact of the unity of opposites in the study of quantum phenomena, as L.I. Ponomarev explains, “... came to the conclusion that this is not an exception, but a general rule: any truly profound natural phenomena can not be unambiguously determined by the words of our language, and requires at least two

mutually exclusive additional categories for its determination” (Ponomarev, 1984, 158).

It is demonstrative that N. Bohr considered it necessary to apply the principle of complementarity to the analysis of not only physical, but also biological and social phenomena significantly differing from them. He wrote: “The integrity of living organisms and characteristics of humans having consciousness, as well as human cultures, are traits of integrity, which reflection requires a typical complementary way of description” (Pozner, 1962, 52).

3. Structural Similarity of Economic Phenomena and Phenomena of the Micro World

Economic phenomena with all their huge difference from atomic phenomena are strikingly similar in their structural properties to microworld objects – atoms and their constituents – protons, neutrons and electrons etc., which form the matter of our Universe. First, attention is drawn to the fact that they both are inherently dual. As an American physical scientist and philosopher F. Capra says: “At the atomic level, matter has dual aspect: it appears as particles and as waves” (Capra, 2010, 190). As an English biophysicist and social scientist Dave Hooke explains in his work “Quantum Theory of Political Economy”, that quantum theory has discovered many dialectical contradictions; the most famous of them is wave-particle duality. According to quantum theory, such particles as electrons, protons, neutrons, etc. may also have wave properties. Interference and diffraction phenomena exhibit wave properties of particles (Hooke, 2007).

The first step in determination the dual nature of a commodity, and thus all other economic phenomena, has already been made in ancient times. The great sophist of antiquity, Aristotle (384-322 BC) in his work “Politics” wrote: “...with every article of property there is a double way of using it; both uses are related to the article itself, but not related to it in the same manner – one is peculiar to the thing and the other is not peculiar to it. Take for example a shoe – there is its wear as a shoe and there is its use as an article of exchange” (Aristotle, 1959, 39-41). At the end of the XVIII century, Scottish scientist Adam Smith (1723-1790) in his famous “Wealth of Nations” (1776) first expressed these two aspects of a commodity in terms of economics. “Usefulness of an object”, i.e. he outlined capacity of a commodity to satisfy the needs as its “use value”, and the use of an “object” for the “acquisition of other objects” – as its “exchange value” (Smith, 1843, 12). Karl Marx in “Capital” has convincingly proved that the commodity is a unity of opposites, contradictory unity of its use value and value (Marx, 1954, ch.1).

Dual structure of economic phenomena, ultimately arising out of the dual nature of labor of commodity producer, as contradictory unity of concrete and abstract labor, is often found directly on the surface of economic life. Thus, the market is a certain ratio of supply and demand, market objects are the products and money, market participants are the sellers and the buyers, actions of market participants are buying

and selling, their motivation: directly monetary to the sellers and directly consumer to the buyer, the capital is constant and variable, the salary is nominal and real, wear and tear is physical and moral, etc.

Similar is the nature of duality of microworld phenomena and economic phenomena. In both cases these are contradictory unities of fundamentally different, seemingly mutually exclusive properties: for matter – the properties of corpuscles and waves, for economic phenomena – the properties of a thing (or a service) and social relations of production. Marx noted: “...The value of commodities is the very opposite of the coarse materiality of their substance, not an atom of matter enters into its composition» (Ibid, 32). If thing properties of economic phenomena are determined by the laws of nature, their socio-economic essence is under the influence of historical economic laws.

Understanding this fact is of fundamental importance. The fact is that the researcher of economic phenomena directly perceives only their material forms, while socio-economic essence of such phenomena is determined by social relations of production hidden from direct observation, which carriers are these things or services. For this reason, the typical error in economic theory is a mixture of material forms of economic phenomena and their socio-economic essence. Theorists, for example, often regard economics commodity simply as a good thing or service⁴, and capital – as a phenomenon purely technical in nature, namely as means of production (machine)⁵. However, it is well known that quite unusable things (for example drugs) can be commodities, and very useful things in natural economy are not commodities. It is also known that not just means of production play the role of capital in practice, but also any items of personal use, no matter how small they may be, if they are produced for profit.

The analysis shows that not only this kind of individual theoretical economics categories, but the whole aggregate of them, does not fit into three-tier rule, indicating that conceptual apparatus of this area of economic theory taken as a whole is beyond the scope of genuine science.

It is characteristically, that physicists are also excited about the issue of mixing of material forms and relations between phenomena. Subatomic particles are meaningless as isolated entities. They can only be understood as interrelations, or correlations between various processes of observation and measurement. In other words, subatomic particles are not things, but interrelations between things, which in turn serve as interrelations between other things, and so on. In quantum theory, we never rest upon things, but always deal with interrelations (Capra and Luisi, 2014).

⁴ According to A Dictionary of Business: “good is a commodity or service that is regarded by economists as satisfying a human need” (Pallister and Isaacs, 1996, 233).

⁵ “The category of “capital” or “investment resources” covers all produced means of production, that is, all kinds of tools, machinery, equipment, factory, warehouse, vehicles used for production of commodities and delivering them to the end user” (McConnell, Brue and Flynn, 2012, 10).

The nature of unity of opposites of quantum objects and economic phenomena is also similar. As L.I. Ponomarev explains, “A quantum object is not a particle and not a wave, and even neither one nor the other simultaneously. A quantum object is a “*tertium quid*”, not equal to simple totality of the properties of waves and particles, as a melody is more than totality of its constituent sounds, and a centaur is not simple totality of a horse and a man, but something qualitatively new” (Ponomarev, 1984, 157). Similarly, the commodity is not a use value, as such, and not a value, but a “*tertium quid*”, namely the use value conditioned not just by technical and technological, but also monetary properties of the product, by profit maximization conditions.

The use value of capitalistically manufactured commodity is not just the utility value to meet the needs of the buyer, but the utility value where the specific conditions of profit maximization in its production and sales are materialized. Moreover, its quality varies within a very wide range. In some cases, profit maximization is achieved by reducing the quality of products as a consequence of lower production costs as a result of using cheaper and low-quality raw materials, cheaper and less skilled labor, as well as obsolete and therefore cheaper equipment. Under high competition conditions, profit growth is ensured on the basis of high quality of the products. Commodity quality considered from this point of view thus appears as a function of profit maximization conditions.

Locally nonlocal effects are inherent to both phenomena of microworld and economic phenomena because of their dual nature. “But beyond these local connections other, nonlocal connections have recently emerged; connections that are instantaneous and cannot be predicted, at present, in a precise, mathematical way” (Capra, 2010, 369). On the one hand, an elementary particle as a corpuscle, is located in the system of local interactions with other particles and, at the same time, by its wave properties, the particle nonlocally directly interacts with all the processes taking place in the Universe. Similarly, material form of economic phenomena (e.g. commodity) is in a system of local interactions with other things in production, storage, handling, etc., and by its value (price) properties it directly interacts with all processes in national and more – in the global economics, and immediately responds to price changes in it. For this reason, identification of differences between local and nonlocal effects of economic phenomena is essential to economic theory. For the purposes of political economy, the most important cell of contradictory duality found by quantum physics is a contradiction of local and nonlocal effects. In many ways, this is a key contradiction or a paradox of quantum theory (Hookes, 2007).

As is known, with transition of physics to analysis of micro world phenomena, the role of the researcher significantly changes. As appropriate, he turns from an outside observer to active participant in the events researched, and no doubt makes certain adjustments to the results of the research. «In atomic physics, then, the scientist cannot play the role of a detached objective observer, but becomes involved in the world he observes to the extent that he influences the properties of the objects.»

(Capra, 2010, p. 176). He is part of the observable world affecting the properties of the objects observed. With regard to economic science, the researchers-economists have never been mere observers, but originally were and are participants in the processes researched.

For this, they do not need to be directly involved in a particular form of economic activity. They simply belong to a particular socio-economic group, class, or system in order for the interests of these social formations began to exert ideological influence on the results of the research. It is this circumstance that is the most important factor contributing to multiplicity of theoretical interpretations of the same problems by the representatives of various schools of economic thought. It was reflected in the structure of economic theory itself, admittedly by the scientists – contradictory unity of economic science and economic ideology. “It is generally accepted, - an American scientist W.J. Samuels notes, - that economic thought, taken as a whole, is penetrated with ideology” (Applebaum and Weintraub, 1977).

4. The Principle of Complementarity and Categories of Political Economy.

Dual, dialectical nature of economic phenomena, like micro world phenomena, for its theoretical expression requires using a three-tier rule as a consequence of the principle of complementarity. Approach to conceptual apparatus of political economy in terms of this rule leads to the conclusion that most of the categories of this science meet the requirements of this rule and reflects three-tier structure inherent to economic phenomena.

Such, for example is the interpretation of commodity category. With regard to the commodity, economic science has long ago established that for adequate expression of its fundamental qualities it is not enough to use single category of the “commodity”. Three categories are required for this, designating both the phenomenon itself and its two poles. One category – the “commodity” – is used to express the product of labor intended for sale, as a basic phenomenon in relation to its two constituent features. Two other categories are used for their designation – the “use value” and the “value”. The use value of the commodity, in turn, has a complex dual structure.

On the one hand, it acts as a contradictory unity of the properties of the commodity and human needs. Changes in each of these two poles are changing the use value. If, for example, commodity properties are deformed, it may lose its use value, i.e., ability to meet the needs of the buyer. However, the same result occurs in case where, while fully preserving commodity properties, the buyer is no longer in need for this commodity. And in this case, the commodity also loses its use value.

On the other hand, the use value of the commodity is dual in the sense that it acts as a contradictory unity of material and socio-economic properties of the commodity: commodity usefulness is in its material properties (real use value) and its value

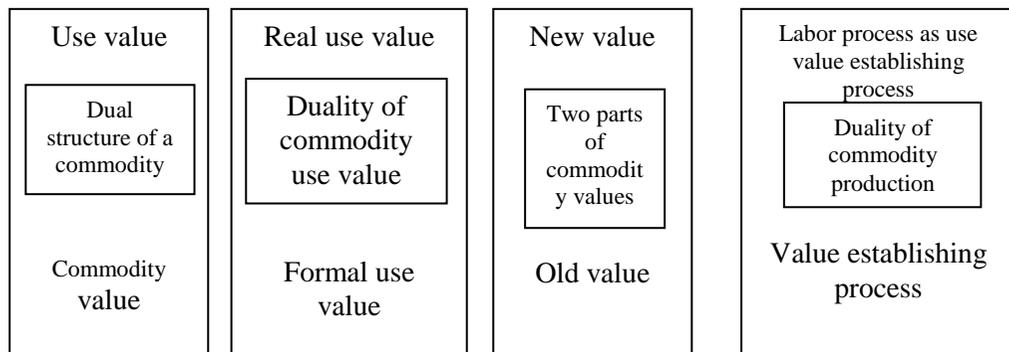
properties (formal use value). The term “formal use value” means that usefulness of the commodity in this case stems from public (commodity, value) form of labor product, not from his material content (Marx, 1954, 62). The usefulness of Faberge Easter eggs, for example, is expressed not only in their aesthetic, but also in their value properties.

The process of commodity use value formation is also dual. On the one hand, here are materialized technological and subjective properties of productive forces, with which this use value was established, and on the other hand – here also, as noted, materialized the properties of social relations of production, as part of which this use value was established. The structure of commodity value is also dual. Newly established value, i.e. value established in the process of production, and on the other – so-called old value, i.e., the value of the means of production, established in the previous period, but spent, and therefore deferred to commodities made in this process of production.

The process of commodity value formation is also dual: on the one hand, in the process of commodity production, its new value is created by abstract labor, and on the other hand in the same process of production, the old value is transferred to the commodity produced by a concrete labor, i.e., the value of consumable means of production.

From all this it follows that commodity production acts as a dual phenomenon. On the one hand, it includes so-called labor process, understood as a process of use value establishing. The other aspect of commodity production is a process of commodity value establishing. These aspects of commodity production differ not only in its content, but also in factors participating in them (see figure 1).

Figure 1. Commodity Production Participation Factors



With the development of commodity relations inherent contradiction of the commodity between its use value and value grows into external contradiction

between commodities that directly act as use values on the market, and money representing a separate isolated material form of existence of the value of traded commodities.

Money, as a specific commodity, is also dual. On the one hand, their utility (use value) is that they represent exposed use values of all the world of commodities, resulting in their absolute liquidity. In money, the value is represented in a general form that allows them to act as a universal equivalent that can be exchanged for any commodities, while in a conventional commodity the value is represented in a special form (in the form of a particular use value), which is extremely impedes direct exchange of one commodities for the other. On the other hand, like all commodities, money has value as the embodiment of socially necessary labor (in this case – represented in the value of traded commodities, served by an appropriate amount of money). As Marx wrote: “...Money is but the converted form of commodities, in which their particular use-values vanish” (Marx, 1954, 104).

Functions of money are also dual. On the one hand, these are the functions of the use value of money as a universal equivalent. This is money as means of circulation and means of payment. On the other hand, money directly performs monetary functions. These are the functions of a measure of value and means of hoarding. Commodities and their “converted form” – money, as is known, are the main market objects. The mechanism of the market, as a specific system of relations between sellers and buyers, where there is a tendency to formation of a single price for the same commodities (Marshall, 2012, 199), is no exception to three-tier rule. As is known, it is dual – it represents a contradictory unity of supply of commodities and demand for them.

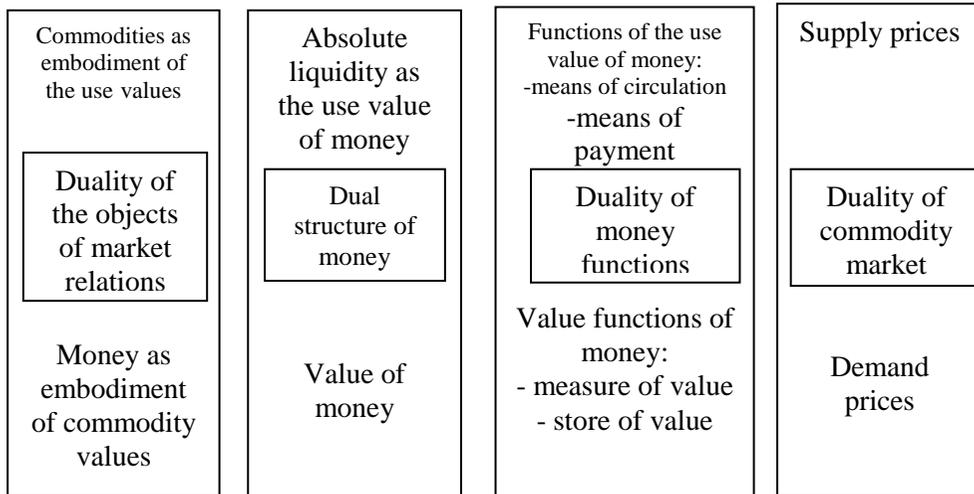
In turn, supply of commodities directly acting as a phenomenon of the use value, is also dual: on the one hand, it is a certain quantity and quality of the use values offered to the buyer, on the other hand – their prices, i.e. the phenomenon of the value order. The demand for commodities is also dual: demand directly is the value phenomenon: it is the money supply, i.e. independent, material differentiated form of existence of value of traded commodities in exchange for commodities. However, the demand at the same time is always directed to one or another definite use value. The nature of both supply and demand has a dual structure. The offer where a buyer is offered commodities of the same type, but at different prices, could be called commodity supply as opposed to offers of various commodities for the same price, which is a kind of money supply of commodities. The same thing is about the nature of demand.

Motivation of actions of buyers and sellers acting as personification of the dual structure of the objects of market exchange – commodities and money is also dual. To buyers, it is directly consumer’s and indirectly monetary. To sellers, motivation is directly monetary and indirectly – consumer’s. As found by the eminent British economist A. Marshall (1842-1924), market prices of commodities are also dual. On

the one hand, they act as demand prices, and on the other hand – as offer prices (Ibid, 2012, 94-95) (see figure 2).

At the same time, market prices are dual in that they show themselves, on the one hand, as nominal, and on the other hand - as real prices, i.e. taken considering solvency of the buyer. Real prices, for example, can grow at constant nominal prices in case of the buyer's solvency decrease.

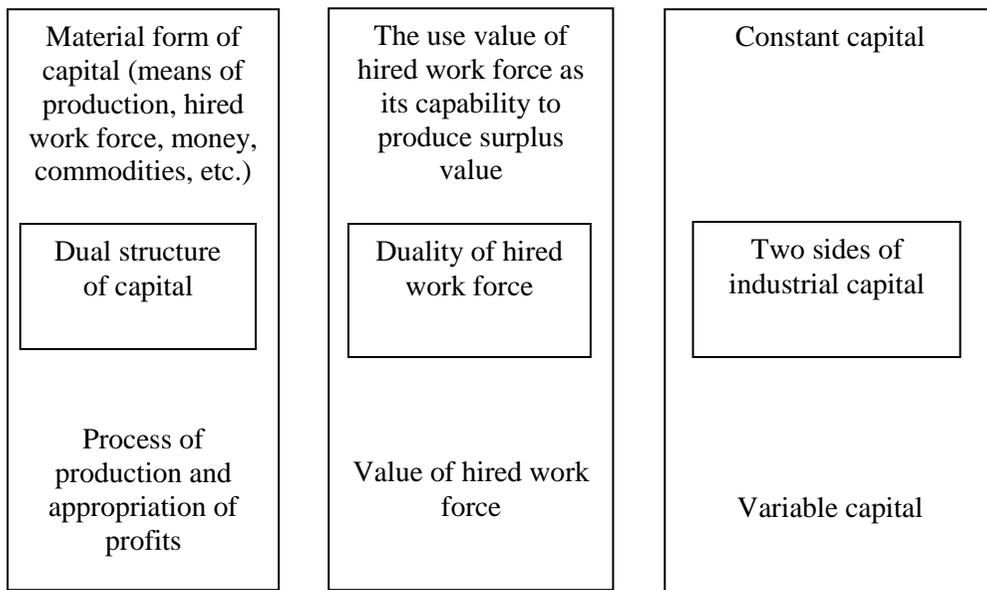
Figure 2. Commodity Market Prices



Pricing laws are also dual. As noted by A. Marshall, this is a law of supply on the one hand and the law of demand on the other hand. Capital, as it is known, represents the things that are used to “make money”, which determines the dual structure of capital. Things by themselves, including the means of production, machines, etc., as they may have been significant, are not capital. They become capital only if used for profit. Therefore, items of personal use, no matter how small they may be, and even not things, but services, labor force, money, stocks, etc. act as capital if they are included in the system of relations of production and appropriation of profits.

Therefore, material form does not matter to capital. This shows that capital is not a thing but a definite social relation of production, namely the ratio of self-expansion of value, expressed in material form. The mechanism of this process, as it is known, is based on the use of the dual structure of the employed labor force, on its ability to produce surplus value, i.e., value exceeding its own value. Thereby functioning hired labor force acts as variable capital, which provides a process of self-expansion of the total capital value, as opposed to the means of production, which represent constant capital (see figure 3).

Figure 3. The Dual Structure of the Employed Labor Force



Dual structure of the labor, commodity, money, market and capital mechanism with the need stipulates duality of all phenomena of market economy having commercial properties (Afanas'ev, 2014). All of them are contradictory unities of various aspects of the use value and the value (price).

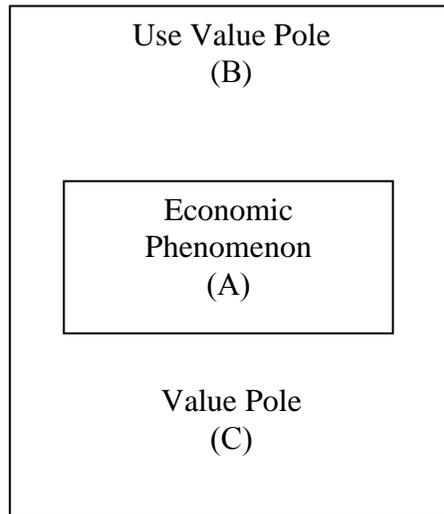
A key role is played here by the dual nature of labor of commodity producers, as contradictory unity of concrete labor creating use value of commodity and abstract labor, acting as a source of commodity value. All other economic phenomena actually reproduce a bipolar structure inherent to this labor in specific forms. Understanding the dependence of the dual nature of economic phenomena from the dual nature of labor allows us to solve an important problem, which cannot be solved by modern bourgeois economic theory, namely to determine what is the economy of society as such.

As considered from this point of view, the economy of society as a whole, in all diversity of its inherent economic phenomena, acts as the aggregate functioning labor on production and reproduction of tangible and intangible benefits, the labor equipped with the means of production, knowledge of the laws of nature, having production qualifications and production experience.⁶ Understanding this fact makes it possible to develop a model of economic phenomena, summarizing these

⁶ The outstanding British economist J. M Keynes has come rather close to the same conclusion. He wrote: "everything is produced by labour". "It is preferable to regard labour...as the sole factor of production, operating in a given environment of technique, natural resources, capital equipment and effective demand". (Keynes, 2006, 193).

inherent properties and thus embodying the requirements of the principle of complementarity in political economy (see figure 4).

Figure 4. Three-Tier Model of Economic Phenomena – ABC, (ABC model)



ABC model can be used as a tool to verify validity of certain theoretical categories, degree of maturity of theoretical categories, as well as development of scientific novelty.

If in any theoretical interpretation of economic phenomena, at least one of the poles of ABC model is missing or its nature is not defined in the structure of the phenomenon, or there are any other inconsistencies in ABC model, this interpretation seems unproven, incomplete and distorted. In it, either basic phenomenon is mixed with one or another of its pole, or basic phenomenon is generally not expressed in certain economic category, and there are only two of its poles (this also happens). In all these cases, a wide field for the development of scientific novelty in the study of economic phenomena and processes reveals. Analysis of the economic phenomenon can be considered complete in its essence only in case of allocation and study of both its two poles and their contradictory unity.

This approach allows specifying the truth criterion of the results of the economic analysis.

5. Concretization of the Truth Criterion

General provision on correspondence of the theoretical position to reality, as their truth criterion, is necessary to supplement in the economic theory by the provision that only the same result of analysis of economic phenomena is true, which represents its inherent bipolar structure. If it is not found, it is a sure sign of the

falseness of such interpretation, since bipolarity is a necessary objective property of economic phenomena.

Using ABC model allows finding theoretical flaws of a number of the most important categories of political economy. It becomes evident in case of violation of three-tier rule in some theoretical interpretation. For example let's first take the case where the interpretation of the category of political economy has no value pole of economic phenomenon; second, the case where theoretical interpretation has no use value pole and, third, the case where both poles of economic phenomena are found, but the basic phenomenon itself remains unknown.

It is striking that theoretical flaw is evident even in such a well-known category as salary. In the current interpretation, it lacks value pole.

Economic science, as we know, distinguishes two forms of salary: nominal and real. So here there are only two links of this phenomenon. That alone should have alerted researchers.

What are these links? And what link is missing in this interpretation? As is known, real salary is a set of the use values acquired at nominal salary. Thus, real salary is a pole of the use value of nominal salary, serving as a basic phenomenon. The third link, namely the value pole of nominal salary, is missing in this situation. Meanwhile, in reality this link undoubtedly exists. This is the value embodied in nominal salary, namely the value of money received in the form of salary, which is kept, lent, deposited in the bank, sent as a gift, inheritance or winning, used to purchase goods, pay taxes and fines, repay debts, for foreign currency changes, etc. However, economic theory has not yet developed the theoretical expression for this category – value pole of nominal salary. Meanwhile, value pole of salary plays the most significant role in the economics, including in the purchase and sale of labor power as a commodity, and through it the law of surplus value exerts its action. That is why Marx in his “Capital” sometimes uses the term “salary value”.

Given the value aspect, nominal salary in its economic structure quite meets the requirements of three-tier rule: it has a pole of the use value (real salary) and value pole (the value embodied in salary). “Unfinished”, not enough meaningful categories include the category of labor productivity. This is all the more strange that achieving the highest labor productivity in Soviet times was considered as the main economic task of socialism, which required as a prerequisite, at least, thorough theoretical development of the problem. But today as well, the growth of labor productivity is not ceased to be the most relevant economic task, determining the fate of the country.

However, the main structural component of labor productivity, which its level and its dynamics depends on, is virtually ignored in the modern economic literature. To verify this, it is sufficient to refer to the latest economic encyclopedias. When considering labor productivity as a specific economic phenomenon, as a rule, the

issue of its structure is not raised, or untenable “two-tier position” prevails in its interpretation missing determinative pole of the phenomenon considered (Pallister and Isaacs, 1996, 398; Rutherford, 1995, 367; Vechkanov, 2002, 531; Kiyan, 1986, 16; Khromov, 1979, 9; Germanova, 1966, 7; Klimov, 1971, 7-11).

In this respect, the position of E.V. Kasimovsky and E.L. Manevich – the authors of the article on labor productivity in “Political Economy” encyclopedia is indicative. By defining labor productivity as “fruitfulness, productivity of industrial activity of people” measured by “the number of products produced by the employee... per unit of time”, they write: “Increasing intensity of labor is of paramount importance in increasing labor productivity under capitalism...” (Kasimovskii and Manevich, 1979, 355-356).

This statement of the authors is fundamentally mistaken, although the increase in intensity of labor really plays an important role in increasing production output per unit of time. But it no way has “paramount” importance. In processing industry of the United States, for example, in just 22 years (1990-2011) the hourly output increased almost three times (2.7 times) (*ProQuest Statistical Abstract of the United States 2014*, 2013, 882). It is clear that labor intensity, which has always been at a very high level in the United States, could not increase by any comparable magnitude during that time (Abel, Bernanke, and Croushore, 2011, 4). This means that hourly output increased mainly due to some other factor, significantly more effective than intensity of labor, but unknown to the authors of the article in the encyclopedia.

Meanwhile, this factor is no longer a secret for economic science. Even in the middle of the century one before last, Marx studied “productive power of labor” in detail, which determines the level of efficiency of a concrete labor, as opposed to intensity of labor, serving as an expression of the amount of labor spent per unit of time.

In 1867, at the beginning of the first chapter of the first volume of “Capital”, Marx wrote: “Productive power has reference, of course, only to labor of some useful concrete form, the efficacy of any special productive activity during a given time being dependent on its productiveness. Useful labor becomes, therefore, a more or less abundant source of products, in proportion to the rise or fall of its productiveness” (Marx, 1954, 32).

Increase in the intensity of labor not only lacks paramount importance in increasing production output per unit of time, but generally is not a factor of increase in “fruitfulness, productivity of production activities of people” for the simple reason that it does not lead to a decrease in labor costs per unit of product. Increasing production output per unit of time is the result of increasing intensity of labor not due to increase of *labor productivity*, and by increasing *the amount of labor spent*.

In fact, this is alleged increase in labor productivity. Moreover, labor intensity increase over normal public level leads to destruction of the workforce, deformation of produced use value and hence to a decrease in labor productivity. Two-tier position, thus, failed to detect really decisive factor of labor productivity growth, and thus to understand the essence of technological progress, because it is the increase in labor productivity that is the embodiment of scientific and technical progress, growth of qualifications and work experience of the employees. Marx wrote: “This productiveness is determined by various circumstances, amongst others, by the average amount of skill of the workmen, the state of science, and the degree of its practical application, the social organization of production, the extent and capabilities of the means of production, and by physical conditions” (Ibid, 1954, 28).

The essence of technological progress is precisely in this change in useful form of labor, which increases the quantity and quality of goods produced per unit of time, i.e., in increase in labor productivity. Because it acts as a phenomenon of a concrete labor, increase in labor productivity leads to an increase in quantity of produced use values and decrease in their cost.

Thus, the structure of labor productivity, as considered from the perspective of the principle of complementarity, acquires the traits of integrity, acting as a contradictory unity of productive power of labor, which determines the degree of efficiency of useful form of labor, and labor intensity as an expression of the amount of labor spent per unit of time. Marx pointed out that “the increase in productive power of labor and the growth of its intensity in one respect have the same effect. Both increase the mass of the products produced in a given period of time” (Ibid, 1954, 368).

The principle of complementarity, as a specific method for determining the integrity of the investigated phenomena, especially plays an important role in the study of complex processes of the market, including such its tools opposing to each other as advertising and marketing.

Advertising, as is known, is focused on the customer – the carrier of solvent demand; marketing, on the contrary, directs its main efforts to commodity producer. Advertising implements two functions closely related to each other: it not only informs the buyer of the properties of commodities offered to him, their prices, terms of sale and delivery, etc., but also seeks to persuade him to buy the advertised commodity. Therefore, it affects the structure of the needs and preferences of the buyer, changing and adapting them to actually existing consumer properties of commodities and their prices.

This means that advertising, influencing consumer’s choice is involved in the process of bringing the individual labor of commodity producers to socially necessary labor before the completion of this process in the event of market purchase and sale of a commodity. The buyer acts in the market as personification of the value

represented in monetary form. Thus, advertising aimed at enticing the buyer to spend his money on commodities offered to him, acts directly as a phenomenon of demand, i.e. as a phenomenon of the value order.

Another phenomenon, included in this process of pre-market stage of bringing individual labor to socially necessary labor, is marketing. However, unlike the advertising, marketing moves in the opposite direction: from the needs and preferences of the buyer to the consumer properties of manufactured commodities. It involves a complex set of activities aimed to ensure that commodities produced in its consumer properties and price to the greatest possible extent is consistent with prevailing needs and preferences of the buyers and its solvent capabilities. To this end, on the one hand, market surveys are conducted with regard to the buyers and market environment in general, and on the other – in accordance with their results – the necessary changes are conducted throughout the research, production and supply chain of the company, aimed at the fullest possible satisfaction of solvent consumer demand.

Hence it is clear that marketing, as opposed to advertising, directly acts as a phenomenon of proposal, and thus – as a phenomenon of the use value. On the one hand, marketing and advertising are opposites. Marketing seeks to fit consumer properties of commodities and their prices to the needs and financial capabilities of the buyers, and advertising, on the other hand, fits the needs of buyers and their price expectations to the properties and prices of commodities offered. On the other hand, there is a deep internal unity of these two most important tools of the market: both marketing and advertising are two sides of the mechanism of pre-market bringing of individual labor of the manufacturers to socially necessary labor and they prepare its completion in the event of purchase and sale of commodities.

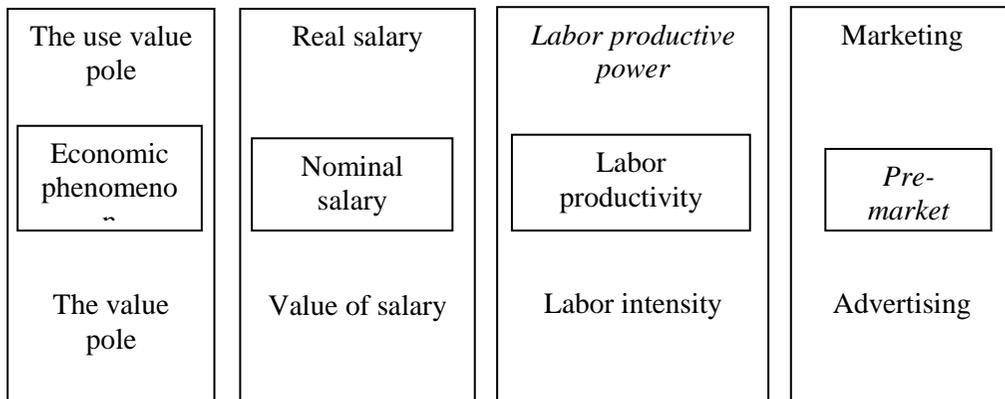
The emergence and development of such a mechanism is due to the increasing complexity of a buyer's market under high-level competition, the development of machine production processes and growing crisis processes of the capitalist economy, the most important among them was the Great Depression of the 30-s of the XX-th century. No coincidence that from this time begins developing and gradually increasing the large-scale extensive system of pre-market bringing the individual labor to socially necessary labor as a contradictory unity of advertising and marketing, largely facilitating the most complex and risky process for the commodity – its sale, transformation of commodities into money.

The scale of this system in the United States is impressive. A significant share (by some estimates, 50% or more) of every dollar received from the sale goes to cover the cost of marketing. Several billion dollars are spent only for marketing research a year. From one-fourth to one-third of people employed in civilian sectors of the US economy are involved in marketing activities (Evans and Berman, 1995). In 2010, advertising agencies of USA, which amounted to about 41 000, employed almost

half a million people, and total advertising spending exceeded 170 billion dollars (*Statistical Abstract of the United States: 2012, 2011, 781,785*).

Contradictory unity of advertising and marketing, performing the function of pre-market bringing of individual labor on commodity producers to socially necessary labor, forms a kind of specific economic phenomenon. Meanwhile, there is no special term in economic science that expresses this phenomenon, the value of which is huge and has a tendency to increase. The existing terminology is inadequate to the existing economic realities. They talk about the “marketing in the broadest sense” including advertising, and about the “marketing” as such (Evans and Berman, 1995). Advertising and marketing originate from the market and are its tools, which perform important functions of the market prior to the event of purchase and sale. They are two sides of some economic phenomenon – pre-market process that prepares sale of commodities in the market and hidden behind their poles. It’s kind of pre-market (see figure 5).

Figure 5. The Pre-Market Process



6. Conclusion

All things considered, ABC model, embodying the requirements of the principle of complementarity in political economy, can detect the missing links in three-tier structure of economic phenomena. Thus, it acts as an effective means of scientific criticism of theoretical categories and development of scientific novelty in political economy. The principle of complementarity which fixed inherent dualistic dialectically contradictory structure as the required step of cognition of nature and society phenomena essence plays the most important methodological role in the analysis of economic phenomena.

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