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The Notion of General Value in Economics

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Abstract

This paper introduces the concept of general value with two components—monetary and nonmonetary. The nonmonetary component reflects individual perception of value unrelated to the monetary part of it. The fundamental difference between the concept of general value and the conventional concepts of value is in the expansion of the concept from monetary only to a more general concept by adding a distinct nonmonetary component. The paper introduces the principle of increasing general value which states that in every action or transaction the general value for each participant should increase. This principle lays the foundation for value-based decision making. To make a decision, an individual needs to assess a difference of general values before and after the action or transaction or to order values rather than to accurately calculate the values themselves. General value can be measured either rationally, similar to utility, or with "bounded rationality", as suggested in behavioral economics, or in any other way which is appropriate and convenient to use. General value in economics plays a similar role as energy in physics and can be referred to as "economic energy." General value constitutes a more comprehensive foundation of economics than traditionally used pure monetary value, and thus goes beyond the classical and neoclassical approaches.

Keywords: value, utility, bounded rationality, behavioral economics, value, theory of value, perception, choice

1. Introduction

1.1 Price and Value

Most economic theories were built on the notion of money and price. The notion of value in economics typically refers to the monetary value, i.e. money. Market demand and supply, market equilibrium, and other economic concepts typically refer to money too. Such an approach creates certain "blind spots" and "missing links" in economic theories. For example, it is commonly agreed that the general long-term strategic goal of a for-profit firm in a free market economy is the maximization of the wealth of its owners. This translates into maximization of the net present value of the firm where term "value" refers to money. (It would be a mistake to define a long-term strategic goal of a firm as profit maximization. Such a goal is quite nearsighted and could lead to wrong decisions. Profit maximization is an operational goal that indicates the value growth rate.) However when the same question is asked about not-for-profit organizations, an accurate and measurable answer is no longer available. Even in case of a for-profit firm, such a general goal of the firm looks extremely money-centric and it seems that the firm should not do anything that may not increase its monetary value because its goal is considered only from the perspective of monetary values—there is no room in this approach for charity or any free services to individuals or community.

Market models describe idealized markets with certain parameters. On the other hand, real-world markets are more diverse and their variety may not fit the constraints of idealized models. It is unfeasible to develop a model for each particular real-world market. For this reason, market models are supposed to serve reference points to approximate the behavior of the real-world markets. For example, the model of perfectly competitive market is an abstraction and such idealized markets do not exist in the real world in its pure form. However some markets are quite close to the perfectly competitive market model though somehow deviate from it. Among real-world markets farmers market is one of the closest to the model of perfect competition. According to the model of perfect competition, sellers and buyers in such a market are small enough not to influence the market equilibrium and all sellers offer uniform products with no differentiation, so buying decisions are based exclusively on price. Therefore firms in a perfectly competitive market are price takers and have to charge a uniform price. However

products or services offered by any real-world firm are different—maybe slightly but different—from products or services of other firms on the same market and for this reason may be sold at slightly different prices. For this reason the model of perfect competition works only for theoretically perfectly competitive firms and cannot be extended to a near-perfectly competitive markets without losing it meaning. Thus the model of a perfectly competitive market may become practically unusable because real-world firms cannot use its conclusions for pricing decision because every products of each firm may show slight differentiation.

Decisions on pricing strategies in different markets, analysis of consumer behavior, assessment of balance and equilibrium between different markets, and many other problems in economics, which are pursued with the traditional price-quantity approach, face significant challenges and lack of clarity.

1.2 Major Theories of Value

The notion of value plays the central role in economics. Generations of economists have developed the appropriate theories tried to define and better understand the notion of value and economic implications from it. The term "theory of value" refers to all such theories rather than to a certain specific approach in theory of value. Value is typically understood as an exchange measure and sometimes simply a price of goods and services. The variety of the theories of value can be divided into two major categories:

- Intrinsic or objective theories
- Subjective theories

Intrinsic theories are based on the classical theory of value that, following Adam Smith publication of 1776 (Smith, 2012) and David Ricardo publication of 1817 (Ricardo, 2004), suggests that prices of goods and services come from objective parameters, say, production cost rather than from subjective considerations (Hollander, 1979). Classical economics follows the labor theory of value. On the other hand, subjective theories presume that price is determined by subjective and perceptional judgments based on satisfaction of consumer desires, utility of the appropriate products or services, and the limitations in their supply. Subjective theories in neoclassical economics originated from marginalism, introduced independently by William Jevons in 1879 (Jevons, 2010), Carl Menger in 1871 (Menger, 2007), and Leon Walras in 1874 and 1877 (Walras, 2010) in the 70s of nineteenth century. Marginalism suggests that value of a good or service is determined by an additional satisfaction (marginal utility) from the most recently added unit of the good or service. Thus value represents the most recent rate of exchange. The concept of marginal utility can be easily illustrated with a diamond-water paradox which was first introduced in 1880s. In normal conditions water has a much higher practical utility for a human than diamonds, but diamonds have a higher value because marginal utility of diamonds is much higher than a marginal utility of water (Rhoads, 2007). However value of water in case of water shortage may significantly exceed the value of diamonds in terms of marginal utility because humans cannot survive without water.

Marginalism laid foundations for neoclassical economics in late nineteenth century that related market demand, supply, and equilibrium to rationality of individuals to maximize their profits or utility. The principles of neoclassical economics have become the major platform for majority of economic theories of the twentieth century. The major criticism of neoclassical approach in economics relates to the presumption of the exclusively rational behavior of market participants. A comprehensive review of neoclassical economics and its view on the concept of value is provided in recent publications (Kahn, 1979; McKenzie & Tullock, 1981; Pollis & Koslin, 1962).

Among many directions in economics, neoclassical Austrian and Chicago schools of economics made significant contributions to the development of the modern theory of value. The Austrian school traces its origin to late nineteenth century and is associated with such names as Friedrich von Wieser, Carl Menger, Eugen von Böhm-Bawerk, and Ludwig von Mises. Friedrich von Wieser in his famous book "Natural Value" (1889, 2012) introduced the imputation theory. The imputation theory argues that the price of output determines the prices of input factors. This approach is inverse to the classical labor approach (Smith, 2012; Ricardo, 2004; Hollander, 1979; Marx, 1992) by which prices of production inputs determine the price of the output. In 1871, Carl Menger argued that there was always a difference of values of present goods and future goods of equal quality, quantity, and form (Menger, 2007). According to Böhm-Bawerk (1890) there are three reasons for this difference of values: (a) in a growing economy, the supply of goods will grow with time, so it will always be higher in the future than at the present time; (b) people normally underestimate their future needs due to carelessness and shortsightedness; (c) and entrepreneurs prefer to produce with inputs currently available rather than postpone their production to wait until the inputs become available in the future. A comprehensive review of the cornerstones of the Austrian school of economics is presented by Šimon Biľo (2005).

The Chicago school of economics can be traced back to the Milton Friedman's paper "Essays in Positive Economics" (Friedman, 1953). Though both Austrian and Chicago schools agree on most major concepts of free market and capitalism, the Chicago school is known for its focus on monetarism and emphasizes the role of government in controlling amount of money in circulation. This implies that national output is affected by money supply. The Chicago school, built with a strong overlap between law and economics, has considered economic processes to be tightly related to other aspects of the society (Baker, 2003) and believed macroeconomics to be tightly related to microeconomics (Lucas, 1988). According to Ronald Coase (1937) firms are formed to reduce their costs by producing goods or rendering services internally rather than purchasing them on the market. The major commonalities and differences between the Austrian and Chicago schools and their concepts of value are clearly presented and discussed in the review published by Ludwig von Mises Institute (Murphy, 2011).

It would be quite unrealistic to expect humans to be perfectly rational in their judgments and choices. Herbert Simon (1955) brought this issue up as the major criticism of the neoclassical economic approaches and models. He suggested that market participant have "bounded rationality." Humans tend to act suboptimally and irrationally by using rules of thumb, hopes, and beliefs rather than accurate calculations. All this gave rise of a new approach called ***behavioral economics*** (Kahneman et al., 1982; Kahnemann et al, 2000; Kahnemann, 2011). According to this approach, human psychology and behavioral patterns play the major role in making judgments, choices, and decisions.

1.3 A Missing Link

Typically, fiat money, may have none or a very low commodity value but is commonly accepted only because of explicit or implicit common perception of money as value. However money is not the only value and there are other values of a nonmonetary nature which are specific to an individual, or a community, or a country, or to the entire mankind. Such nonmonetary values are completely subjective and given consideration at a time of choice, decision on action or transaction in addition to the monetary values. Though certain considerations on subjective perception of value have been given in the neoclassical economics, most discussions were focused on the perception of money and price. The notion of utility was introduced in neoclassical economics to account for perception of money but this attempt fell short of perception of nonmonetary values (Schulak & Unterkofler, 2011; Skousen, 2005; Gale & Swire, 2006).

The approach of compensating variations was introduced by Hicks (1939) as a measure of utility change in terms of additional money an individual needs to compensate for a change in price or product quality to keep the same level of satisfaction. With this approach consumer's surplus can be used as a welfare measure (Chipman & Moore, 1980). The theory of hedonic prices (Rosen, 1974) addresses the spatial equilibrium for differentiated product in which the entire set of implicit prices guides both consumers and producers locational decisions in characteristics space. This theory utilizes the hedonic hypothesis that goods are valued for their utility-bearing attributes or characteristics on the bases of the theory of equalizing differences. The theory of compensating differences has addressed the changes in utility with price, but still was confined within the concept of monetary utility.

The theory of equalizing differences (Brown, 1980; Rosen, 1986) made a step towards a separation of monetary and nonmonetary perception in labor market stated that "workers receive compensating wage premiums wben they accept jobs with undesirable nonwage characteristics, holding the worker's characteristics constant" (Brown, 1980). Dispite its attempt to separate monetary and nonmonetary perception, the theory of equalizing differences could not go beyond the labor market due to its conceptual limitations.

The principles of behavioral economics are based on human "bounded rationality" (Kahneman et al., 1982; Kahnemann et al., 2000; Kahnemann, 2011). Behavioral economics has implicitly addressed nonmonetary values by engaging subjective rules of thumb, beliefs, and hopes as major driving forces in economic decisions but still kept it closely tied up with the monetary values.

The purpose of this paper is to introduce the concept of general value that includes both, monetary and nonmonetary components as separate parts of general perception of value which could be applied to any specific market or it segment as well as to the economy in general.

2. Monetary and Nonmonetary Components of Value

2.1 General Value

According to the classical and neoclassical views, goods and services are assigned certain values. In classical economics value is understood in terms of production cost (labor theory of value) while neoclassical economics

defines value in terms of human perception of the level of satisfaction which is referred to as utility. Behavioral economics argues that humans make their decisions with limited rationality by using rules of thumb, hopes, and beliefs rather than with rational assessment of value. However there is no contradiction between those views on value. Actually humans do not need to calculate value accurately but use it only for comparison of goods or services when make decisions about exchange. An individual really needs to order the values of different goods or services to find out which one brings up a better satisfaction rather than accurately calculate the values. Such ordering is based on personal perception and is specific to each individual under given conditions. To do so, individuals may use their own subjective rules, beliefs and hopes, or quantify of the difference—rather than absolute quantity—of values of the compared goods or services.

The use of differences of values in economics is similar to the use of differences in potential energy in physics. Such an interpretation of the notion of value eliminates the apparent philosophical conflict between neoclassical and behavioral views on economic value. Thus the only reason for introduction of the notion of value is to use the difference of values for making decisions on preferences. The difference of values may be assessed either rationally or with bounded rationality.

Traditionally, the notion of value has been used in economics in its monetary meaning. However there are nonmonetary values not directly related to money or its perception. Examples of such values are individual preference to certain activities, life style, music, sciences, human relationships, and many others. Nonmonetary values contribute to human decisions along with monetary values. We define the term ***general value*** as a combination of monetary and nonmonetary values. It can be assumed that the monetary and nonmonetary components are linearly related, i.e.

$$V_k = V_k^M + V_k^N \tag{1}$$

where V_k is general value, V_k^M and V_k^N are monetary and nonmonetary components respectively, and index k identifies the individual because any judgment about value is subjective and specific to an individual. Both the monetary and nonmonetary components of value may in turn include different sub-components. For the sake of shortness, we will sometimes refer to general value simply as value.

2.2 Measuring General Value

To operate with the concept of general value it is necessary to know how to measure value and its components. The monetary component of value is traditionally measured either directly in units of money or in perception of money which is referred to as utility (Wicksteed, 1910; Stigler, 1950a, 1950b; Peterson & Lewis, 1998). Measuring monetary components of value in units of utility is more appropriate than doing it directly in the units of money because the utility approach reflects subjective perception of money by an individual. Different individuals or even the same individual in different circumstances may have different perception of the same amount of money.

It is obvious that both components of value, monetary and nonmonetary, should be measured in the same units to enable comparison of both components because they are additive components of general value. Thus we could try to measure both components, monetary and nonmonetary, in the units similar the units of utility. The concept of utility for the monetary component is quite clear and has been used since the neoclassical period in economics. The nonmonetary component of value can be measured in parity with the monetary component of value. It is usually difficult to assess the nonmonetary values in terms comparable to the monetary values. "However, using the right tools, you can infer the worth of your comparative advantages and disadvantages" (Gale & Swire, 2006).

Measuring individual perception requires certain level of conceptual clarity and consistency. Economists of many generations have been engaged in pursuing this challenging task. Many different theories were introduced to measure subjective perception of values. There are two major concepts of utility: ***cardinal utility*** and ***ordinal utility***. The concept of ***cardinal utility*** assumes that utility can be mapped to a numeric scale (Strotz, 1953) while the concept of ***ordinal utility*** (Pareto, 1906) addresses the case when the perception of a particular good or service cannot be measured using a numerical scale but can be only assessed in order of priority with alternative bundles (combinations) of goods—we can call it measuring in parity with alternatives. Another approach of dealing with consumer preferences was presented in the ***revealed preference theory*** (Samuelson, 1938) which assumes that consumers purchasing habits can reveal their preferences when consumers consider choices. Consumers may consider risky choices with different possible outcomes, decisions on which can be based on risk analysis. The model of ***expected utility*** was introduced to handle such situations (Bernoulli, 1954; Neumann & Morgenstern, 1944). Bernoulli derived his approach in the analysis of St. Petersburg lottery, often called the

St. Petersburg paradox (Bernoulli, 1954). The St. Petersburg lottery is played by flipping a fair coin until it comes up tails, and the prize is equal to the total number of flips, n, which equals $\$2^n$ (Martin, 2011). The expected value of the game is an infinitely high. However "few of us would pay even $25 to enter such a game" (Hacking, 1980). This paradox is based on the fact that most people do not follow a naïve decision criterion that takes only the expected value into account when possible reward is very high and possible loss is very low. Before the middle of twentieth century ***expected utility*** was called ***moral expectation***. Regardless of the mathematical expected value people may make irrational decisions to avert or to seek risk. Neumann and Morgenstern (1944) applied the game theory to expected utility. The Bernoulli approach laid foundations for the theory of ***marginal utility*** which is conventionally understood as an additional utility from an additional unit of a good or service. More accurately marginal utility is defined as a derivative of utility over the quantity of goods or services as

$$MU_k(Q) = \frac{dU_k(Q)}{dQ} \tag{2}$$

where $MU_k(Q)$ is marginal utility for individual k at quantity Q (money, product, services), $U_k(Q)$ is the appropriate utility, and Q is quantity of the used entity.

Utility reflects individual perception of money, goods or services. Commonly accepted values in a society could be viewed as collective aggregate utility of all individuals in the society. An aggregate collective utility of a society can be represented by a ***social welfare function*** (Bergson, 1938, 1954; Samuelson, 1938). Different choices with the same perceived utility indicate the same level of satisfaction with the choices adopted by a given society.

Critics of marginal utility in ***behavioral economics*** (Simon, 1955; Kahneman et al., 1982; Kahnemann et al, 2000; Kahnemann, 2011) argues that this concept of marginal utility is applicable to rational actors while humans normally act irrationally and their behavior is mostly based on their psychology, rules of thumb, heuristics, and behavioral patterns rather than on accurate calculations. This criticism has merits and should be taken into account.

In this paper we suggest to measure nonmonetary components by indifference parity with the monetary component. It means that if an individual is equally willing to give up a certain quantity of monetary value for a certain increment of nonmonetary value or vice versa such a transaction or action does not change the total general value, i.e.

$$\Delta V_k = \Delta V_k^M + \Delta V_k^N = 0 \tag{3}$$

Thus one can say that for any indifferent transaction or action the increment of the nonmonetary value is equal to the increment of the monetary value with the opposite sign, with the conservation of the general value, i.e.

$$\Delta V_k^M = -\Delta V_k^N \tag{4}$$

We do not expect all humans to accurately or rationally calculate components of value, though it may be the case for some individuals. The components of general value could be assessed by an individual either rationally by calculating or irrationally with "bounded rationality" by applying rules of thumb, or any other human heuristics. Different individuals may make assessments differently depending on the personal choice of each individual.

The monetary and nonmonetary components of general value can be assessed in many different ways, rational or irrational. The major point of this approach is that individuals are somehow able to assess perceived differences of the components of general value, ΔV_k^M and ΔV_k^N, for the given choices in their own way. In conclusion, it should be mentioned that all components of general value are measured in units of individual perception which may be different for different individuals and even for the same individual in different circumstances.

3. Principle of Increasing Value, Transaction Power, and Efficiency

3.1 Principle of Increasing Value

Every transaction is an exchange of values between participants. However there are some other activities outside the scope of transactions, i.e. activities which are not associated with exchange, for example, a choice of action. Any activity, either associated with an exchange or not, is referred to as action. Each participant makes a decision to pursue with an action if the resultant value (the general value after the action) for this participant is higher or at least not less than the initial value (the general value before the action), i.e.

$$V_k^{after} \geq V_k^{before} \quad \text{or} \quad \Delta V_k = V_k^{after} - V_k^{before} \geq 0 \tag{5}$$

for each participant k of the action. The difference between values after and before the action ΔV_k is referred to as the added value for the action undertaken by the participant. This statement can be paraphrased as: in result of any action the added value should grow or at least stay unchanged.

Actions resulted in a positive added value are referred to as positive actions while actions resulted in a zero added value are referred to as neutral actions. Sometimes an action may result in a negative monetary value. However, it does not contradict the principle of increasing value because, if an individual decides to pursue with the action despite a loss in the monetary value, it means that the nonmonetary value of this action increases sufficiently enough to offset the loss of the monetary value in the added general value in this transaction to make the increment of the general value positive or at least zero. For example, any charity action leads to a monetary lose for the charity giver. However the entire general value in that action increases due to a high nonmonetary component of the general value.

3.2 Transaction Power and Efficiency

Any transaction increases values for all involved parties or at least not to reduce them. Let's consider a transaction between two participants and introduce the term ***transaction power*** which we define as the total added value for all participants of the transaction, i.e.

$$W = \Delta V_1 + \Delta V_2 \tag{6}$$

where W is the transaction power and ΔV_1 and ΔV_2 are the added values of participants 1 and 2 in the transaction. It is obvious from the definition in Eqs. (5) and (6) that all positive transactions have positive transaction power, i.e. $W > 0$ while all neutral transactions have zero transaction power, i.e. $W = 0$.

However the participants may receive different added values from their transaction. A fair transaction is understood as a transaction where both participants get the same added value. On the other hand, we consider a transaction unfair if the added value of one participant in much higher than the added value of another participant. The less difference between the added values of the transaction for both participants the more fair is the transaction. We introduce the term ***transaction efficiency*** which reflects a degree of fairness of a transaction. The transaction efficiency is measured in terms of closeness of the added values for both participants, i.e.

$$E = 4\frac{\Delta V_1 \Delta V_2}{(\Delta V_1 + \Delta V_2)^2} = 4\frac{\Delta V_1 \Delta V_2}{W^2} \tag{7}$$

where E is the transaction efficiency.

According to the definition in Eq. (7), transaction efficiency is a parameter in the range between zero and one, i.e. $E \in [0,1]$. If both participants of a transaction receive equal added values, then $E = 1$ and such a transaction is called perfectly efficient. It means that the transaction is considered the most fair. On the other hand, in the extreme case when one participant receives no added value while the other one receives a nonzero added value, the transaction is called extremely inefficient and its efficiency equals zero, $E = 0$, and the transaction is considered extremely unfair.

Assume that the added value of participant 1 is α-times higher than the added value of participant 2, i.e.

$$\Delta V_1 = \alpha \Delta V_2 \tag{8}$$

Then by the definition of transaction efficiency given in Eq. (7) one can conclude that efficiency of this transaction

$$E = 4\frac{\alpha}{(\alpha + 1)^2} \tag{9}$$

If $\alpha = 1$, it means that the transaction is fair, i.e. $\Delta V_1 = \Delta V_2$, the transaction is perfectly efficient, i.e. $E = 1$. If $\alpha = 0$ ($\Delta V_1 = 0$ and $\Delta V_2 > 0$) or $\alpha = \infty$ ($\Delta V_1 > 0$ and $\Delta V_2 = 0$), then the transaction is extremely inefficient. We will not apply the term efficiency to neutral transactions because no added value is produced in such transactions.

3.3 Analogy with Physics

Money in economics may play a similar role as energy in physics. (Ksenzhek, 2007; Aityan, 2011). This paper extends the analogy between general value in economics and energy in physics. To go along with this analogy, it would be reasonable to assume that each transaction or action tends to bring an economic system to a state with the highest added value similarly to a trend of physical system to get to a state with the lowest potential energy in static equilibrium. If go beyond the monetary interpretation of value, the general value may play a similar role in economics as energy in physics where money or monetary utility is just one of the components of the "***economic***

energy."

It may be the case that the current turmoil in global economy caused by certain lack and dissipation of economic energy on the global scale. This angle of view is yet to be pursued and analyzed.

4. Special Cases and Examples

The following cases and examples are intended to illustrate and clarify the concept of general value.

4.1 Job Selection

If job *A* offers compensation S^A expressed in dollars, then the general value of this job for individual *k* is

$$V_k^A = U_k(S^A) + V_k^{NA} \tag{10}$$

where $U_k(S^A)$ is the monetary value of amount S^A and V_k^{NA} is the nonmonetary value of job *A* for individual *k*. The nonmonetary value of the job is measured in the same units as the monetary value for the individual, which could be interpreted in terms of parity with the monetary value. Monetary value can be measured either in terms of utility or in any other terms convenient for the individual, rationally or with bounded rationality. In some cases for the sake of simplicity we may consider neutral monetary value similar to neutral utility, $U(W) = W$, i.e. perception of money to be equal to the amount. Suppose the same individual is offered another job *B* with compensation S^B and nonmonetary value V_k^{NB}, so the total (general) value of this job is

$$V_k^B = U_k(S^B) + V_k^{NB} \tag{11}$$

The individual will take a job which has the highest total value. The difference between values of job *A* and *B* for the individual is

$$\Delta V_k^{AB} = V_k^A - V_k^B = \left(U_k(S^A) - U_k(S^B)\right) - \left(V_k^{NA} - V_k^{NB}\right) = \Delta V_k^{MAB} + \Delta V_k^{NAB} \tag{12}$$

where $\Delta V_k^{MAB} = U_k(S^A) - U_k(S^B)$ is the difference of monetary values of jobs *A* and *B* and $\Delta V_k^{NAB} = V_k^{NA} - V_k^{NB}$ is the difference of nonmonetary values of these jobs for the individual. Note that, in general, $U_k(S^A) - U_k(S^B) \neq U_k(S^A - S^B)$. Suppose job *A* offers a lower compensation than job *B*, i.e. $\Delta V_k^{MAB} < 0$ but the nonmonetary value of job *A* is higher than the nonmonetary value of job *B*, i.e. $\Delta V_k^{NAB} > 0$ in such a way that total difference of values of jobs *A* and *B* is in favor to job *A*, i.e. $\Delta V_k^{AB} > 0$. Then the individual will choose job *A* over job *B*. If for another individual the monetary value of job *A* is not as high compare to nonmonetary value of job *B*, then that individual will chose job *B*.

An Example

Suppose business graduate is offered a job of business analyst (job *A*) with annual compensation \$60K. The same graduate is also offered another job of a garbage processing operator (job *B*) with the same annual compensation. For the sake of simplicity we do not consider other benefits offered by the employers. The graduate chooses job *A* because he likes it better. It means that

$$\Delta V_k^{AB} = \Delta V_k^{MAB} + \Delta V_k^{NAB} > 0 \tag{13}$$

where the difference between monetary values of these jobs equals zero, $\Delta V_k^{MAB} = 0$, because of equal compensations for both jobs while the difference of nonmonetary values of these jobs is in favor of job *A* for this particular individual, $\Delta V_k^{NAB} > 0$.

Suppose that the compensation for job *B* is now increased to \$100K. Assume that in this situation, the graduate is not sure which job to choose. It occurs because the difference of the monetary values of jobs *A* and *B* is high enough in favor of job *B* in the perception of the graduate, $\Delta V_k^{MAB} < 0$, to compensate for the lower nonmonetary value of job *B* in comparison to job *A*, $\Delta V_k^{NAB} > 0$, i.e. both jobs in the perception of the graduate have equal general values, so

$$\Delta V_k^{AB} = \Delta V_k^{MAB} + \Delta V_k^{NAB} = 0 \tag{14}$$

Suppose the compensation for job *B* is now \$200K. Most likely, the graduate will choose job *B* because the difference of the monetary values of jobs *A* and *B* is too high to overtake the higher nonmonetary value of job *A* in comparison with job *B*, i.e.

$$\Delta V_k^{AB} = \Delta V_k^{MAB} + \Delta V_k^{NAB} < 0 \tag{15}$$

In result, we can conclude that difference of nonmonetary values of these two jobs for that particular person is

$$\Delta V_k^{NAB} = -U_k(\$60K) + U_k(\$100K) \tag{16}$$

because according to Eq. (14) the individual is indifferent (equally satisfied) about the jobs when compensation for job *A* is \$60K and for job *B* is \$100K.

Let's assume this particular individual has a neutral perception of money, i.e. $U_k(S) = S$ at the time of choice, so the difference between nonmonetary values of job *A* and *B* is

$$\Delta V_k^{NAB} = -U_k(\$60K) + U_k(\$100K) = -\$60K + \$100K = \$40K \tag{17}$$

where $U_k(\$60K) = \$60K$ and $U_k(\$100K) = \$100K$. It means that the difference of nonmonetary values of jobs *A* and *B*, ΔV_k^{NAB}, is equal to the difference of compensations for the jobs with the opposite sign, $-\Delta V_k^{MAB}$, in case of the indifferent choice.

4.2 Transaction Decision

Individual *k* comes to a bakery to buy a loaf of bread at price *P*. Before the act of exchange (purchase), the individual has the money and the baker (denote him with index *n*) has the bread. Thus the individual and the baker have the following values before the transaction

$$V_k^{before} = U_k(P) \text{ and } V_n^{before} = V_n^{Bread} \tag{18}$$

and after the transaction their values are

$$V_k^{after} = V_k^{Bread} \text{ and } V_n^{after} = U_n(P) \tag{19}$$

The added values in this transaction for the individual and the baker are

$$\Delta V_k = -U_k(P) + V_k^{Bread} \geq 0 \text{ and } \Delta V_n = U_n(P) - V_n^{Bread} \geq 0 \tag{20}$$

Both parties, the individual and the baker, agree on the transaction if the added values for both are positive. It means that value of having the loaf of bread for the individual is higher than the value of amount of money *P* while for the baker the value of amount *P* is higher than the value of the bread. Neither the individual nor the baker agree to do the transaction if in result they lose value.

The total transaction power is

$$W = \Delta V_k + \Delta V_n = U_n(P) - U_k(P) + V_k^{Bread} - V_n^{Bread} \geq 0 \tag{21}$$

and the transaction efficiency is

$$E = \frac{\Delta V_k \, \Delta V_n}{\left(\Delta V_k + \Delta V_n\right)^2} = \frac{\left(-U_k(P) + V_k^{Bread}\right)\left(U_n(P) - V_n^{Bread}\right)}{\left(U_n(P) - U_k(P) + V_k^{Bread} - V_n^{Bread}\right)^2} \tag{22}$$

4.3 Buying Choice

Suppose individual *k* considers buying a pair of shoes. There are two different pairs of shoes *A* and *B* at prices P^A and P^B, respectively, available in the store. If the individual buys shoes *A* or *B* his added value will be

$$\Delta V_k^A = -U_k(P^A) + V_k^{NA} \text{ and } \Delta V_k^B = -U_k(P^B) + V_k^{NB} \tag{23}$$

The monetary part in the added value comes from the price paid by the individual for the shoes. It is included in the added value with the negative sign because it is part of the value the individual had before the transaction, i.e. the money which the individual paid for the shoes. On the other hand, V_k^{NA} and V_k^{NB} are the nonmonetary values for the individual of having shoes *A* and *B* appropriately. These components of value are added with the positive sign because it is the acquired value after transaction as shown below.

$$\begin{aligned} V_k^{A\,before} &= -U_k(P^A) \\ V_k^{A\,after} &= V_k^{NA} \end{aligned} \quad \text{and} \quad \begin{aligned} V_k^{B\,before} &= -U_k(P^B) \\ V_k^{B\,after} &= V_k^{NB} \end{aligned} \tag{24}$$

The individual makes a buying decision based on the added value rather than on the price only. For simplicity, we consider neutral monetary utility, i.e. $U_k(P) = P$ for individual *k*. Suppose shoes *A* are more expensive than

shoes B, i.e. $P^A > P^B$, but both prices are within the individual's budget for shoes. On the other hand, if the individual likes shoes A better than shoes B, that the difference of the nonmonetary values of this shoes for individual k is higher than the inverse difference of the monetary values, so the added value of shoes A as higher than the added value of shoes B, i.e. $\Delta V_k^A > \Delta V_k^B$ then the individual buys shoes A.

If the same individual has limitations of money he can spend on shoes, then a certain difference in prices $P^A - P^B$ may project to a greater difference in monetary components of value $U_k(P^A) - U_k(P^B)$, which in turn may lead to $\Delta V_k^A < \Delta V_k^B$ then individual k makes a decision to buy shoes B.

4.4 Trade Decision

Suppose party k trades with party n. Party k trades product A for product B of party n. Both products have different monetary and nonmonetary values for each parties. Products A and B could be, for instance, collectible ancient golden and silver coins which have monetary (market) values, and nonmonetary (personal collectible) values. The monetary value of the coin goes beyond just commodity value of it but is defined by the market value of the coin which includes its overall collectible value. Personal collectible value may come, for instance, from the fact that the collection of individual k is missing coin B that creates some additional value of the coin for individual k. Let's for simplicity presume that both traders, k and n have neutral utility for money, i.e. $U_k(P) = U_n(P) = P$. Before the trade the parties have the following values

$$V_k^{before} = P^A + V_k^{NA} \text{ and } V_n^{before} = P^B + V_n^{NB} \tag{25}$$

After the trade the values of these parties will be

$$V_k^{after} = P^B + V_k^{NB} \text{ and } V_n^{after} = P^A + V_n^{NA} \tag{26}$$

where V_k^{NA}, V_k^{NB}, V_n^{NA}, and V_n^{NB} are the nonmonetary values of coins A and B for parties k and n. Parties A and B will be willing to do the trade if

$$\begin{aligned} \Delta V_k &= V_k^{after} - V_k^{before} = V_k^{NB} - V_k^{NA} - \Delta P^{AB} \geq 0 \\ \Delta V_n &= V_n^{after} - V_n^{before} = V_n^{NA} - V_n^{NB} + \Delta P^{AB} \geq 0 \end{aligned} \tag{27}$$

where $\Delta P^{AB} = P^A - P^B$ represents the difference in monetary values between products A and B. Thus party k and party n are willing to pursue with the trade if both parties increase or at least keep unchanged their values, i.e.

$$\begin{aligned} V_k^{NB} - V_k^{NA} &\geq \Delta P^{AB} \\ V_n^{NA} - V_n^{NB} &\geq -\Delta P^{AB} \end{aligned} \tag{28}$$

If both coins have the same monetary (market) values, i.e. $P^A = P^B$ or $\Delta P^{AB} = 0$, then the transaction will take place if party k likes coin B better than coin A and party n likes coin B better than coin A. It may occur if party k misses coin B in his collection and party n misses coin A in his collection or for many other reasons unrelated to the market value of the coins.

4.5 My Kingdom for a Horse

In Richard III, a history play by Shakespeare, King Richard III being unhorsed in a climax of a battle cried out, "*A horse, a horse, my kingdom for a horse!*" Let's analyze this from the point of view of general value.

The general value of a horse in a perception of the king, V_k^H, is

$$V_k^H = U_k(P^H) + V_k^{NH} \tag{29}$$

where P^H is the market price of the horse, $U_k(P^H)$, is the utility of the price for the horse in a perception of the king, and V_k^{NH} is the nonmonetary value of this horse for the king. The general value of the kingdom for the king is V_k^K which is very high but limited. We will not even divide it into monetary and nonmonetary because it is not necessary for the purpose of this example.

The general value of the horse V_k^H and the general value of his kingdom V_k^K for Richard III in a normal situation are related as $V_k^H << V_k^K$ and for this reason the king does not even consider trading his kingdom for a horse. However when his life became threatened in the battle, the perceived nonmonetary value of a horse $\overline{V_k^H}$ significantly exceeded the value of his kingdom, $\overline{V_k^H} > V_k^K$, and for this reason trading the kingdom for a horse became a viable idea for him.

4.6 Gresham's Law

The well-known Gresham's law reads that "*bad money drives good money out of circulation*." Let's analyze this law from the point of view of general value. Suppose there are two types of money, money *A* and *B*, and all people have similar perception of the both components of value. The general value V^{α} of money α (α = *A*, *B*) is

$$V^{\alpha} = V^{\alpha,Nom} + V^{\alpha,Comm} + V^{N\alpha} \tag{30}$$

where $V^{\alpha,Nom}$ is the nominal value, $V^{\alpha,Comm}$ is the additional commodity value, and $V^{N\alpha}$ is the nonmonetary value of money α. Both, nominal and commodity values belong to the monetary component of value. The nonmonetary value of money may come from its condition (a crispy bill or a shiny coin), antiquity (coin age), or collectability (rareness and show quality) or any other features.

4.6.1 Fiat Money versus Commodity Money

Suppose money *A* is paper (fiat) money and money *B* is gold (commodity) money. Both paper and commodity money have the same nominal value, different commodity values, and the same (maybe zero) nonmonetary value i.e.

$$V^{A,Nom} = V^{B,Nom}\,;\;\; V^{A,Comm} < V^{B,Comm}\,;\;\; V^{NA} = V^{NB} \tag{31}$$

and thus

$$V^{A} < V^{B} \tag{32}$$

The assumption of equal nonmonetary values of both kinds of money in this example is taken only for the purpose of simplicity.

According to the differences in general values of paper and gold money, we definitely prefer to use paper money and keep gold money, i.e. to use the money with the lower general value and keep the money with the higher general value. It proves the Gresham's law from the perspective of general value.

4.6.2 Crisp Bills versus Worn Bills

You may recall a situation when paying in stores you prefer to pay with worn bills and keep new crispy bills of the same nominal value. Both crisp, *A*, and worn, *B*, bills have the same nominal value, equal and actually none commodity values, and different nonmonetary values because we just prefer crispy bills in our valet. It means

$$V_k^{A,Nom} = V_k^{B,Nom}\,;\;\; V_k^{A,Comm} = V_k^{B,Comm}\,;\;\; V_k^{NA} > V_k^{NB} \tag{33}$$

where $V_k^{X,Nom}$, $V_k^{X,Comm}$, V_k^{NX} are the nominal, commodity, and nonmonetary values of bill *X* correspondently. The nominal and commodity values constitute the monetary component of the general value. The difference between nonmonetary values of crisp and worn bills can be explained by a simple fact that we like crisp bills better than worn bills. It makes the general value of crisp bills higher than the general value of the worn ones,

$$V^{A} > V^{B} \tag{34}$$

Thus according to the difference in general value, we keep crisp bills and pay with worn ones.

5. Isovalue

If all jobs offer considered in the example in section 4.1 above have the same general value $V_k^{A} = V_k^{B} = \ldots = V_k^{Z}$ while their monetary (offered compensations) and nonmonetary components are different, then individual *k* will be indifferent (equally satisfied) in choosing any job from the given jobs. The jobs which offer the same general value constitute an *isovalue* curve in the space of monetary and nonmonetary values. In case of linear relationship between monetary and nonmonetary components of the general value as in Eq. (1), *isovalues* form a set of parallel lines, one for each level of general value as shown in Figure 1.

For instance, if an individual equally considers two jobs, one with monetary value (annual compensation) $V_k^{MA} = U_k(S^A) = U_k(\$60K)$ and another with $V_k^{MB} = U_k(S^B) = U_k(\$100K)$, it means that the difference of monetary values of jobs *A* and *B*, $\Delta V_k^{MAB} = V_k^{MA} - V_k^{MB}$, is compensated by the difference of nonmonetary values of this jobs, $\Delta_k^{NAB} = V_k^{NA} - V_k^{NB}$, as $\Delta V_k^{NAB} = -\Delta V_k^{MAB}$. It means that we may be equally satisfied with different jobs even if one of them pays less than another just because we like the first job better. Most likely, most of us have faced a similar dilemma in our lives.

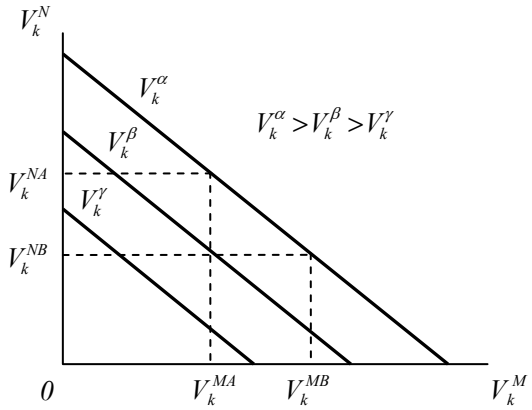

Figure 1. Isovalues in the monetary-nonmonetary space

6. Business Analysis

The concept of general value can be easily applied to business analysis.

6.1 The General Goal of a Business

6.1.1 Traditional View

The general goal of a for-profit business is typically defined as maximization of the owners' wealth which translates into maximization of the net present value of the business, where value is traditionally understood in its monetary meaning. This is a quite crisp and measurable definition. However when we talk about a not-for-profit organizations, the definition of the general goal of such an organization becomes quite vague, fuzzy, and non-measurable. Moreover, if we talk about a for-profit company, the traditional definition of the general goal gets in conflict with social and charitable activities of the company. It leads to a conclusion that as any social and charitable activity results in a monetary loss, such an activity should be avoided. It is clear that such an approach suffers serious deficiency.

6.1.2 View from General Value

Let's consider general value of a business as a combination of the monetary and the nonmonetary components, as

$$V_k = V_k^M + V_k^N \tag{35}$$

where index k identifies the perception of the company management team. The general goal of the company is defined as maximization of the net present general value of it. This definition fits all, for-profit companies, not-for-profit organization, and any combination of them. In an extreme case of a "completely greedy" for-profit company the nonmonetary component of the general value equals zero and the company should be concerned only about monetary value as in a traditional approach. In an extreme case of a pure not-for-profit organization the monetary component of the general value equals zero and the organization should maximize its net-present general value by maximizing only net present nonmonetary part of it. For a real-world for-profit company maximization of net present general value includes both components. It means that the company may give up some monetary gains for nonmonetary gains to maximize the net total general value. Most for-profit companies are engaged in free-of-charge social services and charities. The tradeoff between monetary and nonmonetary components depends on the company's perception of value. If a company believes that additional benefits for its employees, which do not directly translate into the company profit, add more to the company general value than the monetary gain given up for such benefits, the general value of the company grows and the company goes for it in accordance to its general goal and the company's perception of values. A similar consideration could be given to any company or organization regardless of whether it is a for-profit company or a not-for-profit organization.

6.2 Opportunity Decisions

Suppose individual k has to make a decision either to go to a theater or to do some work for money. If the individual goes to the theater, he has to pay $100 for a ticket but, if the individual decides to work, he will make

$150. What does drive the individual's decision?

The general value of going to the theater is

$$V_k^T = -P^T + V_k^{NT} \tag{36}$$

where P^T is the price of a theater ticket (monetary value) and V_k^{NT} is the nonmonetary value of enjoying a play in the theater for individual *k*. On the other hand, the value of going to work is

$$V_k^W = P^W + V_k^{NW} \tag{37}$$

where P^W is the compensation (monetary value) the individual gets for that period at work and V_k^{NW} is the nonmonetary value for individual *k* of enjoying work ($V_k^{NW} > 0$) or hating it ($V_k^{NW} < 0$), or being neutral to it ($V_k^{NW} = 0$). The difference between general values of going to the theater and going to work is

$$\Delta V_k^{TW} = V_k^T - V_k^W = -P^T - P^W + V_k^{NT} - V_k^{NW} \tag{38}$$

Thus if $\Delta V_k^{TW} > 0$, then the individual makes a decision to go to the theater but if $\Delta V_k^{TW} < 0$ then the individual chooses to go to work. If $\Delta V_k^{TW} = 0$ then the individual is indifferent about the choice of action. Monetary values in Eqs. (36) – (38) for the sake of simplicity were expressed in money rather than in perception of money.

For example, many teachers are giving extra classes to their students without additional compensation, just because they see a high nonmonetary value of this activity. Very often, teachers give up their entertainment and come to schools to give their students extra classes. If a teacher does not see a sufficient nonmonetary value of this action, this teacher would not do it.

7. Difference between the Concepts of General Value and Utility

Critics of the suggested approach may argue that the concept of general value is identical to the concept of utility. Actually, both concepts address humans' individual perception. However there is a fundamental difference between these two concepts. First of all, the concept of utility applies to the perception of consumption or usage of money, goods, or services related to a transaction or an exchange while the concept of general value may apply to the monetary and nonmonetary perception regardless of usage or consumption and does not necessary imply a transaction or an exchange. Secondly, the distinction between monetary and nonmonetary components of value provides a clear approach that separates monetary perception related to a transaction or exchange from the nonmonetary perception of value. The nonmonetary component of value reflects a subjective perception independent of the monetary part. Thirdly, the approach of general value provides a more explicit and a less speculative way of assessment of subjective perception of a broader variety of entities in economics as it was illustrated in the examples in section 4 above.

8. Conclusion

This paper introduced the concept of general value that consists of two components—monetary and nonmonetary. The nonmonetary component of value reflects individual perception unrelated to the perception of monetary part of value. Both components of value can be measured in units of human perception either rationally similar to units of utility or with "bounded rationality" as suggested in behavioral economics, or in any other units which are appropriate and convenient to use. The fundamental difference between the concept of general value and conventional concept of value is in a separation of values unrelated to money from the values related to money. Both monetary and nonmonetary components of general value represent two sides of the perception of value.

To operate with the notion of general value one has to be able to compare monetary and nonmonetary components for a single actor (an individual or a group of individuals) and compare values of different actors rather than accurately measure them. To make a decision an individual needs to assess a difference or to order values rather than to accurately calculate the values themselves. Actors are not expected to be completely rational as assumed in neoclassical economics and may act with "bounded rationality" as assumed in behavioral economics.

Every action or transaction decision obeys the principle of increasing the general value of every participant. General value, is believed, constitutes a more comprehensive foundation of economics than traditionally accepted pure monetary value.

General value in economics plays a similar role as energy in physics. This analogy may be extended to the principles of equilibrium. It would be reasonable to assume that each transaction or action tends to bring an economic system to a state with the highest added value similarly to a trend of physical system to get to a state with the lowest energy in equilibrium. Thus we can call general value "economic energy."

The concept of general value goes beyond the classical and neoclassical views on value. The approach of general value helps make judgments and make decisions in a much broader scale of situations than just in market exchange.

The concept of general value provides a solid foundation for analysis of fundamental processes and decisions in economics for which the neoclassical concept of utility falls short of conceptual integrity and clarity.

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