

Analysis of Competitive Strategies by Asserting General Value

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Abstract

This paper introduces a new quantitative approach for competitive analysis based on the notion of general value. General value is a combination of monetary value, which relates to the product price, maintenance and, possibly, final utilization costs, and nonmonetary value, which represents the consumer satisfaction with and need in the respective product. Products compete by their general value rather than by just the monetary component of it. Different competitive products may show different combinations of their monetary and nonmonetary components of value. The market shares of the competitive products can be found by the distribution similar the Boltzmann distribution in Physics, where general value plays the role of energy.

Keywords: competition, competitive analysis, value, value proposition, utility, bounded rationality, behavioral economics, theory of value, consumer perception, buying decision, consumer choice

1. Introduction

In the analysis of competitive strategies for goods or services, firms use the approach of cost or differentiation advantage. If a firm is the cost leader, then it pursues the cost leadership strategy and, if a firm offers the best differentiation, then the firm uses the differentiation strategy. However, there are many firms competing in the market with similar products or services and most of them are not cost or differentiation leaders. How such companies can assess their competitive positioning? Can a firm pursue both, cost and differentiation leadership? What will occur in the market in this case?

In the competitive analysis, the accent on cost or differentiation is normally made qualitatively, that does not allow firms to estimate quantitatively their product positioning with the chosen competitive strategy. The extremes of cost or differentiation do not represent actual competitive strategy choices. A typical question, whether it is possible to combine cost and differentiation strategies, leads to long and wordy discussions with quite diverse and fuzzy opinions lacking quantitatively justified assessments. Actually, the firm's competitive advantage should be based on the assessment of value proposition offered to the consumers or other categories of buyers.

The concept of value is one the central concepts in economics that goes far beyond a simple monetary representation and should include the level of satisfaction with the respective goods or services. How is it possible to quantify the firm's competitive positioning and assess the market potential for the respective goods or services?

The Bertrand's model of competition (Bertrand, 1883; Kreps & Scheinkman, 1983) describes market competition based in the presumption of undifferentiated products and the balance between production capacities and prices leading to the Cournot/Nash equilibrium.

Several economic approaches have been developed to link price and differentiation for the analysis of competitive behavior. 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 (Brown, 1980; Rosen, 1986) has addressed the changes in utility with price, but still was confined within the concept of monetary utility.

The theory of equalizing differences made a step towards a separation of monetary and nonmonetary perception

in labor market stated that “workers receive compensating wage premiums when they accept jobs with undesirable nonwage characteristics, holding the worker’s characteristics constant” (Brown, 1980). Despite 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.

However, consumer preferences play a significant role in market competition, providing competitive advantage to some firms and other producers. The revealed preference theory (Samuelson, 1938) assumes that consumers purchasing habits can reveal their preferences when consumers consider choices. Consumers may consider risky choices with different possible outcomes.

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.

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 (Friedman & Savage, 1948; Friedman, 1953) 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 theory of general value (Aityan, 2013) considers two components of value, the monetary and nonmonetary components. Both components are equally important in assessing value. Buying decisions are based on general value rather than only on monetary value. The goal of this paper is to apply the theory of general value to the competitive analysis and to develop a quantitative approach for assessing the offered value for achieving competitive advantage proceeding from a combination of cost and differentiation of the product in the market.

2. The Outlines of the Theory of General Value

The theory of general value (Aityan, 2013) presents value as a linear composition of the monetary and nonmonetary components of value, i.e.

$$V = V^M + V^N \quad (1)$$

where V is general value, V^M and V^N are the monetary and nonmonetary components of value, respectively. The monetary component represents the respective amount of money or, more accurately, the perception of that amount of money, i.e. utility of money. The nonmonetary component of value represents the level of satisfaction not directly related to the money. The level of satisfaction as well as the utility of money strongly depend on the subjective perception of an individual or a group of people, that also reflects cultural aspects and specific circumstances.

For the sake of simplicity, we will often refer to general value simply as *value*, to the monetary component of value as *monetary value*, and to the nonmonetary component of value as *nonmonetary value*.

Monetary value can be measured in units of perception of money, e.g. in neoclassical terms of utility of money, or in terms of the value function in behavioral economics (Kahneman & Tversky, 2000), or, in simple cases of neutral utility of money, just in the amount of money. It is important to note, that due to the linear relationship between the monetary and nonmonetary components of value presented in Eq.(1), these two components should be measured using the same units. However, this fact does not mean that these two components are identical by their nature.

Nonmonetary value represents the level of satisfaction that may include a variety of factors such as satisfaction of using the product, brand name, fashion, convenience, ease of use, social perception, life style, habits, hobbies, acceptance by the group of people, and many other factors, which are not directly related to the cost or price.

It is very important to understand how to measure the nonmonetary value. The difference of the nonmonetary values of two choices A and B can be measured by applying the principle of indifference. This principle is based on finding the balance, when the individual is indifferent to the given choices (Aityan et al., 2016, 2017), i.e.

both choices have the same general value, i.e.

$$\Delta V_{AB} = V_A - V_B = 0 \quad (2)$$

where ΔV_{AB} is the difference in general values of choices A and B . In accordance with Eq.(1), Eq.(2) can be rewritten as

$$\Delta V_{AB} = V_A^M + V_A^N - V_B^M - V_B^N = 0 \quad (3)$$

where V_A^M , V_A^N , V_B^M , and V_B^N are the monetary and nonmonetary values of choices A and B , respectively. At the indifference point according to Eq.(3), the difference in the nonmonetary values of the choices A and B is equal to the difference of the monetary values of the choices

$$\Delta V_{AB}^N = -\Delta V_{AB}^M \quad (4)$$

where ΔV_{AB}^M and ΔV_{AB}^N are the respective differences in the monetary and the nonmonetary values of these choices,

$$\begin{aligned} \Delta V_{AB}^M &= V_A^M - V_B^M \\ \Delta V_{AB}^N &= V_A^N - V_B^N \end{aligned} \quad (5)$$

At the indifference point, the difference in the nonmonetary values equals the negative difference in monetary values of the given choices, making the general value the same.

Thus, one can measure the difference in the nonmonetary values of two choices by measuring the difference in the monetary values at the indifference point.

It is important to point out that individuals, normally, assess the difference in general values of given choices rather than their absolute values separately.

The difference in the nonmonetary values of different jobs was measured according to the methodology described above (Aityan et al., 2016). The methodology is based on finding the point of indifference, where an individual has no preference among the choices of jobs. The difference in the nonmonetary values of the jobs was measured based on the differences in the compensations for the jobs according Eq.(4). It was shown that different groups of people have different perception of the nonmonetary values of jobs and therefore expect different monetary compensation for those categories of jobs.

The relative nonmonetary values of two different products (goods or services) from, the consumer's standpoint, more specifically, the difference in the nonmonetary values of the products, can be measured by finding the point of indifference by varying the monetary components, i.e. prices of the products that make the general values of these products equal. With the equal general values, the consumer is indifferent of purchasing either product. This methodology, as shown in Eq.(4), was applied for measuring relative nonmonetary values for goods and services for specific groups of consumers (Aityan et al., 2017).

3. General Value of Products to Purchase

General value of a consumer product consists of the monetary and the nonmonetary components of value as shown in Eq. (1). The term product includes both, goods or services. The monetary component of the value, V_A^M , of product A is the consumer perception of its price, cost of maintenance and, possibly, final utilization, P_A , contributes the general value with the negative sign because the higher price, the lower value of the product for the buyer. The buyer considers the product price as the reduction of general value. Such perception can be measured in terms of utility of money, $U(P_A)$, for a given individual as shown in Eq.(6),

$$V_A^M = -U(P_A) \quad (6)$$

The nonmonetary component of general value, V_A^N , of the same product A represents the level of satisfaction for the given consumer with the product regardless of its price. Thus, the general value of product A is

$$V_A = -U(P_A) + V_A^N \quad (7)$$

The utility of money may significantly differ from the amount of money, particularly, when the amount goes beyond the normal affordable range for the given individual. By the normal affordable range, we understand the amount of money, which do not cause any significant financial or psychological stress for the individual. In the normal range of affordable prices, the utility of money can be relatively accurately approximated just by the amount of money, i.e. $U(P_A) = P_A$ that makes the monetary value of the product equal the price of the product with the negative sign as

$$V_A^M = -P_A \quad (8)$$

However, if the price goes beyond the normal affordable range, one cannot ignore the difference between the amount and utility of money.

4. Price as Monetary Value

Utility of money presents the perception of value of the amount of money by a given individual or a group of individuals, who have similar perception of money. The scale of utility reflects the internal perception of the given individual. The most important are the ratios (proportions) rather than absolute numeric representation of the utility as a function of money. Though, utility of money and the amount of money are principally different and utility of money is not a linear function of the amount (Friedman & Savage, 1948), there is a range of the amounts of money, where the utility of money is almost linearly proportional to the respective amount of money for a given individual or a given group of people. Analysis conducted in behavioral economics vividly indicated that risk-taking inclinations significantly depend on the possibility of gaining or losing money (Kahneman et al., 1982; Kahnemann et al., 2000; Kahnemann, 2011). It would be quite unrealistic to expect humans to be perfectly rational in their judgments, decisions, and choices. Herbert Simon (1955) suggested that market participant have “bounded rationality.” Thus, the near-linear range of the utility of money is specific to each individual and depends on the wealth, income, risk-taking inclinations, formal and informal obligations, and other constraints and circumstances.

The monetary component of general value is typically represented by the utility of money for a given individual or a group of consumers. However, for the purpose of simplicity in the near-linear range of the utility of money, we can use amount of money for the assessment of the monetary component of general value for the product as suggested in Eq.(8).

5. Buying Decision without Additional Constrains

Consumers normally consider for purchasing those goods or services, which have positive general value for them. If general value of the product in the perception of the consumer is positive, it means that the product’s nonmonetary value is higher than the perception of its price according to Eq.(7). In other words, the consumer believes that the satisfaction obtained from the product is worth the price paid for it. An example of the positive general value for product A is shown in Figure 1(a). On the other hand, if the general value of a good or service is negative, as illustrated in Figure 1(b) for product B, the consumer does not consider buying the product because the consumer’s satisfaction with the product is not worth the price.

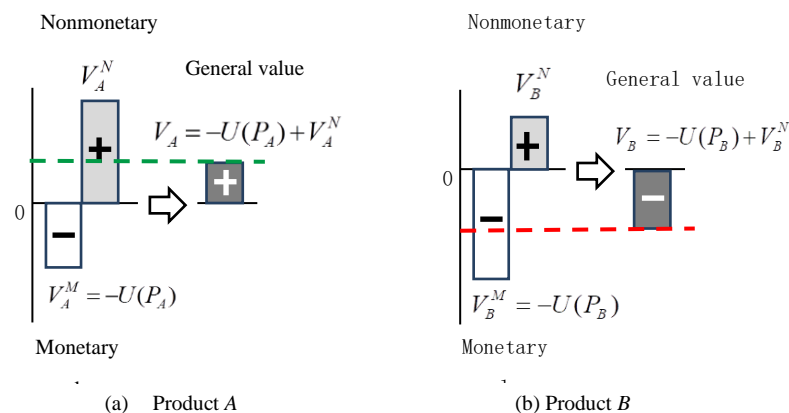


Figure 1. An example of (a) the positive general value of product A that may lead to a buying decision by the consumer and (b) the negative general value of product B that leads to a not-buying decision by the consumer

Thus, consumers consider products with the positive general values and do not consider products with the negative general values.

In choosing between two competitive products with positive general values, the consumer prefers the product with the higher general value as illustrated in Figure 2.

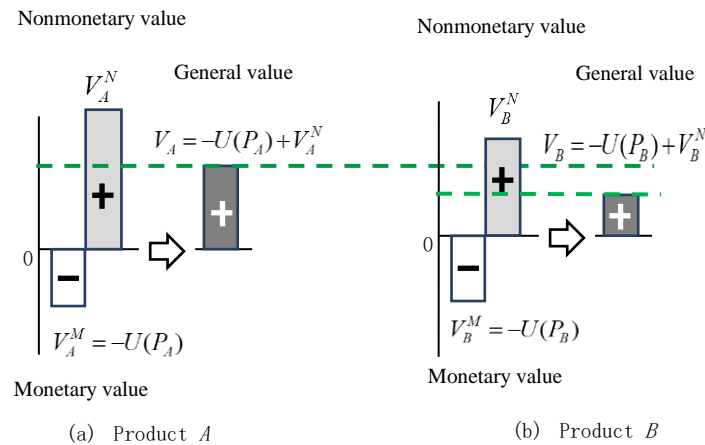


Figure 2. An example of the general value of product A higher than the general value of product B that makes the buyer prefer product A

The difference of the nonmonetary values of these products can be interpreted as the product differentiation or the differences in need in these products. The relative nonmonetary value of two products, i.e. the difference of their nonmonetary values, can be measured by finding the indifference point for the consumer as was suggested in Aityan et al. (2017) and discussed above in this paper.

Figure 3 shows two products, A and B, which offer the same general value, while their monetary and nonmonetary components are different. The higher price for product B is compensated by a higher nonmonetary value (satisfaction, differentiation, or need) of product B relative to product A, resulting in the equal general values for both products.

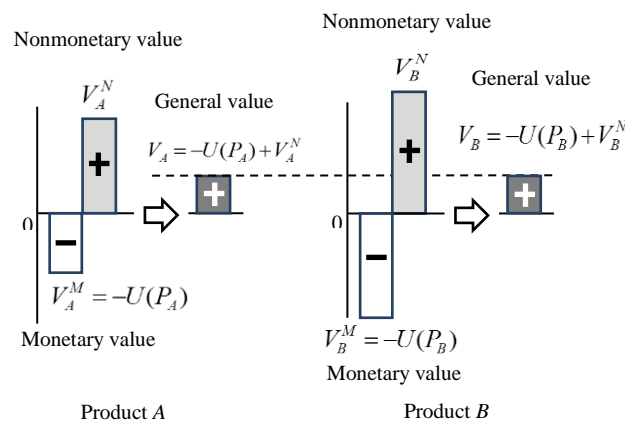


Figure 3. An example of the equal general values of products A and B for a specific consumer

Two products, which offer the same general value for the consumer as shown in Figure 3, are equally competitive in the market, if there are no additional constraints influencing the consumers' buying decisions such as price constraints or differentiation constraints (quality, specific features, etc.). For example, product B in Figure 3 offers higher differentiation (nonmonetary value) than product A, but, on the other hand, product B is more expensive than product A. However, in result, both products offer the same general values. Thus, the consumer should be indifferent about buying either product unless the consumers have certain constraints in their buying decision-making.

Nonmonetary values of products and services are specific for each consumer but similarly shared by a group of consumers. Thus, similar nonmonetary values can be referred to specific groups of consumers. For example, tastes and perception of the generation of millennials are significantly different from the tastes and perception of the generation of baby boomers, though are quite similar inside each generation group. Typically, groups of consumers sharing similar interests are expected to share similar nonmonetary values.

6. Sales of Computer Monitors as an Example of Competitive Power

Currently outdated CRT computer monitors were the primary computer monitors on the market up to the end of the 20th century. Later, they were replaced by the flat panel monitors. Let’s use this case for the competitive analysis based on the assessment of general value as illustrated in Figure 4.

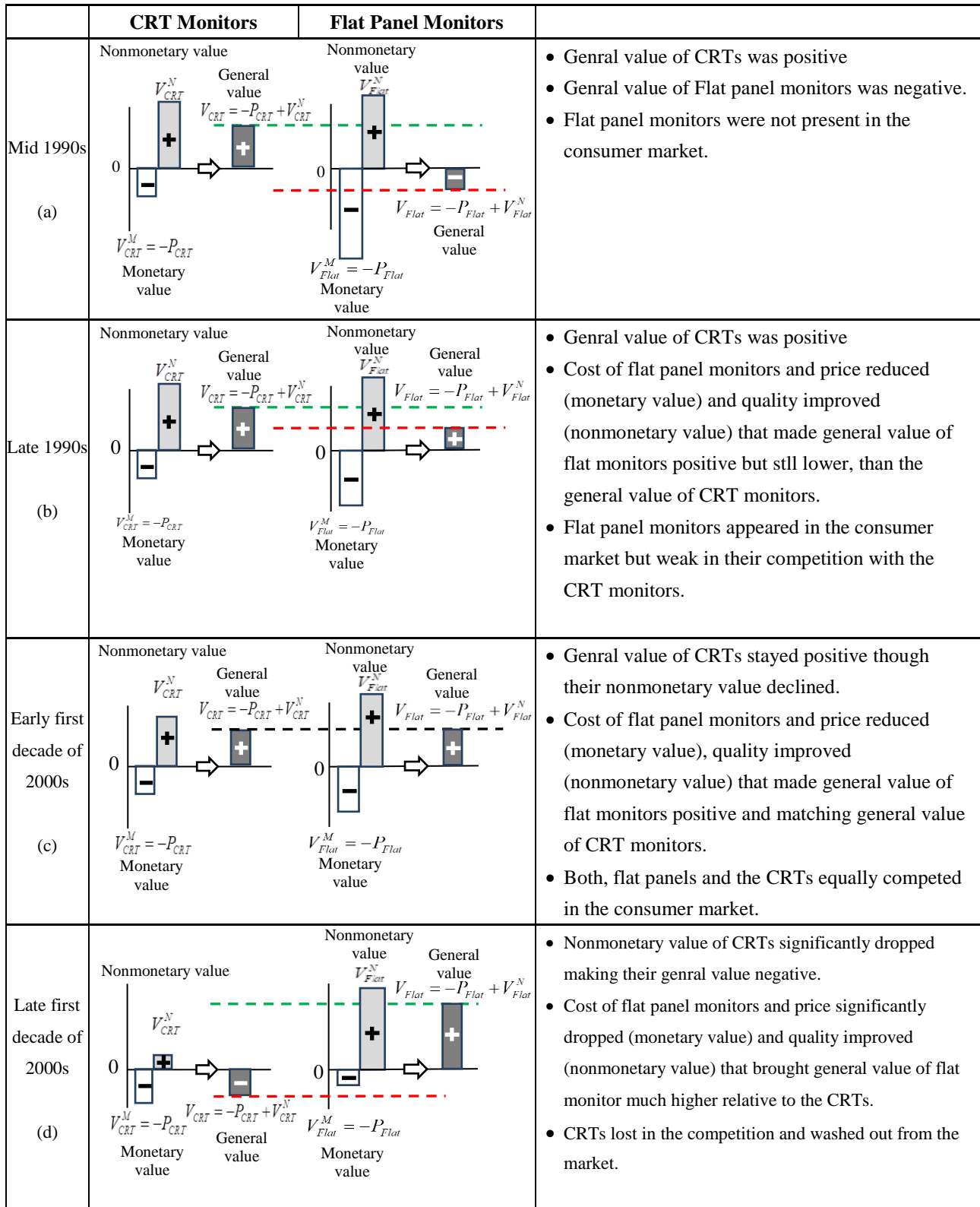


Figure 4. Competition between CRT and flat panel monitors from the perspective of general value

It is obvious that flat panel monitors offer the higher nonmonetary value than CRT monitors due their convenience and, in the present time, quality of picture. The monetary value of goods for the consumers is represented by the perception of their price, maintenance and, possibly, final utilization costs. For the sake of simplicity, let's use the price itself as the product monetary value as it was discussed above in this paper.

Up to the late 1990s, flat panel monitors were extremely expensive compared to the matching CRTs. For this reason, consumers were not interested in the flat panels and the CRTs were dominated the market. Flat panel monitors were not present in the consumer market at all because of their negative general value caused by the high price (Figure 4a). In the late 1990s, production costs and hence, the price for the flat panel monitors were reduced and their general value turned positive, though was still much lower than the general value of the CRTs (Figure 4b). During this period, flat panel monitors appeared in the consumers market but had quite low market share.

At the turn of the century, the production costs and hence, prices for the flat panel monitors were significantly reduced to the degree, that general values of flat monitors and the CRTs equalized, thus, both types of monitors had almost the same general value (Figure 4c). In result, both types of monitors were equally competitive in the market in the early 2000s. The progress in the flat panel monitors technology has led to a significant drop in the production cost and significant improvement in the quality of flat panel monitors. Thus, by the end of the first decade of the 21st century, the general value of flat panel monitors significantly increased, while general value of the CRTs had dropped as shown in Figure 4d. In result, CRT monitors had been washed out from the market.

The schematic analysis above has clearly and explicitly demonstrated a constructive approach applying the concept of general value in competitive analysis. Among competing products, i.e. goods or services, the products with the higher general value succeed in the competition. Products with the negative general values are forced to leave the market.

7. Buying Decisions under Monetary and Nonmonetary Constrains

Most consumers have certain constraints impacting their buying decision. Such constraints could be monetary constraints, representing certain limitations on the affordable price (reservation price), or nonmonetary constraints, representing special requirements to the product quality, differentiation, etc.

Suppose, three competing products, *A*, *B*, and *C* are offering similar general values, though have different monetary and nonmonetary components of value as shown in Figure 5 and Figure 6. It looks that the all three products should equally share the market because they offer the same level of general value. However, some of the products with the same general value may have unaffordable prices of offer substandard features that mat reduce their competitive power.

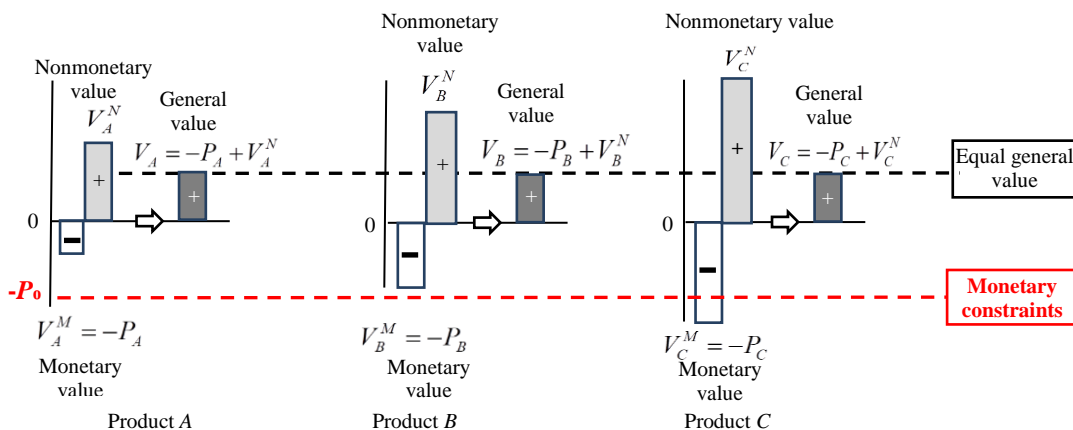


Figure 5. An example of equal general values offered by products *A*, *B*, and *C* (Black dotted line) superimposed with the monetary (price) consumer constraints (Red dotted line) that pushes product *C* out of the market

The three products, *A*, *B*, and *C* in Figure 5 show the same general value, though have different monetary and nonmonetary components of value. As soon as these products share equal general values, they must be equally competitive in the market, if no consumer constraints are imposed. However, some level of prices may be unaffordable for certain category of consumers due to their income or other limitations, while some other

consumers may have their reservation prices for those products. These limitations impose monetary constraints, say, P_0 . It means that the products with the price P , higher than the price P_0 that represents the monetary constraint (Red dotted line in Figure 5), i.e. products with $P > P_0$, are not considered for purchasing by this category of consumers. As is clear from Figure 5, prices for products A and B are lower than the monetary constraint, i.e. $P_A < P_0$ and $P_B < P_0$, while the price for product C is higher than the monetary constraint, i.e. $P_C > P_0$. Thus, product C is not considered for purchasing regardless of its general value but due to monetary constraints. In result, only products A and B are successfully competing in the market, but product C becomes uncompetitive for this particular category of consumers.

As an example, one may compare generic and fashion cloths. Generic cloths have the lower price but offer the lower differentiation for the consumers. Some categories of consumers do not consider a high-end cloth for purchasing regardless of their fashion and quality due to monetary (price) constraints. Some other category of consumers may impose monetary constraints simply as a reservation price, say, deciding that they would not pay more than, say, \$100 for a pair of shoes, not because they cannot afford it, but just do not believe that shoes should worth more.

On the other hand, some consumers prefer products of high level of quality and differentiation. One can express such a nonmonetary constraint in terms of the lowest level of the nonmonetary value, the consumers are willing to consider for purchasing as schematically shown in Figure 6. Three products A , B , and C with the same general value (Black dotted line across the products on the level of general value) are presented in the figure, where the nonmonetary constraint is shown with a Green dotted line across the products. It means that products with the nonmonetary value below a certain level are not considered for purchasing by this category of consumers. In the case shown in Figure 6, products A and B offer nonmonetary values below the level of the nonmonetary constraint, and therefore are not considered for purchasing; only product C is considered for purchasing as its nonmonetary value is above the nonmonetary constraint.

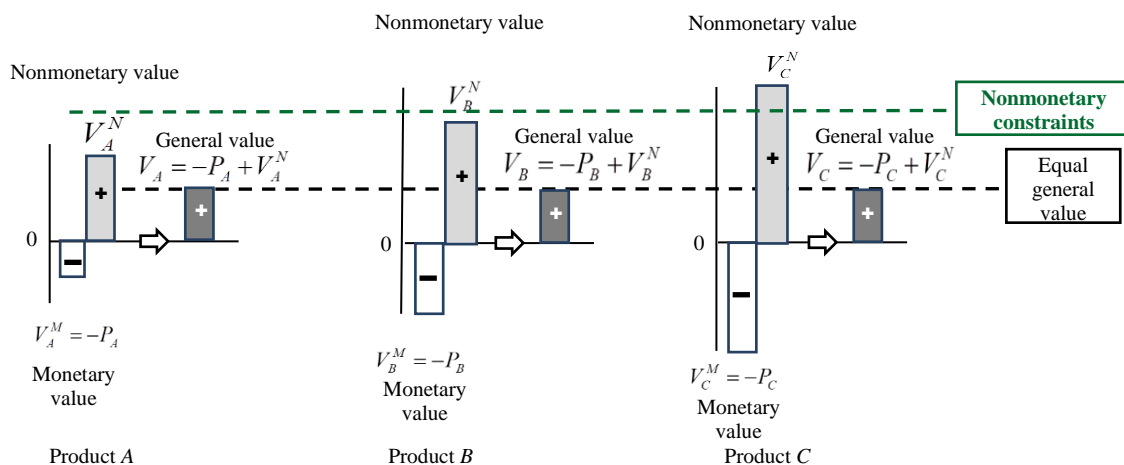


Figure 6. An example of the similar general values offered by products A , B and C (Black dotted line) superimposed with the nonmonetary (quality, differentiation, etc.) consumer constraints (Green dotted line) that pushes products A and B out of the market

As an example, a given category of consumers may consider only TV sets with the internet connection, not considering the TV sets, which have no such connection regardless of their prices.

Different monetary and nonmonetary constraints are imposed by different groups of consumers. Such constraints may relate to different groups of consumers and depend on income, fashion, education, cultural values, taste, habits, political situation, and many other factors.

8. Market Share Analysis

Different competitive products may offer different general values for the consumers. It is reasonable to assume that among competitive products, the products with the higher general value, have the higher consumer demand. The question is, how these products would share the market. It is reasonable to assume that the product's general value plays the role of energy in the market. By analogy with the Boltzmann distribution in Physics, we can suggest that the demand for the competitive products would be exponentially distributed in the market on their

relative general values. This approach will be illustrated below, using two competitive products and then expanded to a variety of competitive products. For the sake of simplicity, we assume that there are no constraints imposed by the consumers.

8.1 Two Competitive Products without Consumer Constraints

Suppose there are only two different competitive products, present in the market, product 1 and product 2. The products offer general value, V_1 and V_2 and the market shares of these products are C_1 and C_2 . The market shares of the products represent the concentration of these products on the market, i.e. the quantities of these products sold relative to the total sales of both product in the market. By analogy with the Boltzmann distribution in Physics, the market shares of these products can be expressed as

$$\frac{C_1}{C_2} = \exp(\theta(V_1 - V_2)) = \exp(\theta\Delta V_{12}) \tag{9}$$

where ΔV_{12} is the difference of the general values between products 1 and 2

$$\Delta V_{12} = V_1 - V_2 \tag{10}$$

and θ is the constant representing the degree of competition, liquidity, and other characteristics of the market in general. We will address the detailed analysis of θ in the next paper.

The total market share of these two products is 1 (or 100%) representing the entire market for those products,

$$C_1 + C_2 = 1 \quad \text{and} \quad C_1 \geq C_2 \tag{11}$$

Thus, Eq.(9) can be rewritten as

$$\frac{C_1}{1 - C_1} = \exp(\theta\Delta V_{12}) \tag{12}$$

and hence

$$C_1 = \frac{\exp(\theta\Delta V_{12})}{\exp(\theta\Delta V_{12}) + 1} = \frac{\exp(\theta\Delta V_{12} / 2)}{\exp(\theta\Delta V_{12} / 2) + \exp(-\theta\Delta V_{12} / 2)}; \tag{13}$$

$$C_2 = \frac{1}{\exp(\theta\Delta V_{12}) + 1} = \frac{\exp(-\theta\Delta V_{12} / 2)}{\exp(\theta\Delta V_{12} / 2) + \exp(-\theta\Delta V_{12} / 2)}$$

where C_1 and C_2 are varying from 0 (or 0%) to 1 (or 100%) of the market for those products.

It is worth to notice, that the market shares of the products depend on the difference of their general values rather than on the absolute level of each general value.

The market shares of products 1 and 2 as a function of the relative general value, ΔV_{12} , of product 1 versus product 2 (Eq.10) are shown in Figure 7. The relative general value of two products is referred to as the difference of general values of these two products. If both products have equal general values, they equally share the market 50%-50% ($C_1 = C_2 = 1/2$). As the difference of their general values, $\Delta V_{12} = V_1 - V_2$, grows, product 1 is getting the greater market share tending to get the entire market, i.e. $C_1 \rightarrow 1$, if $\Delta V_{12} \rightarrow \infty$, i.e. grows indefinitely high. If the difference ΔV_{12} goes to the negative zone and keeps falling, $\Delta V_{12} \rightarrow -\infty$, the market share of product 1 becomes lower and tends falling to zero, i.e. $C_1 \rightarrow 0$.

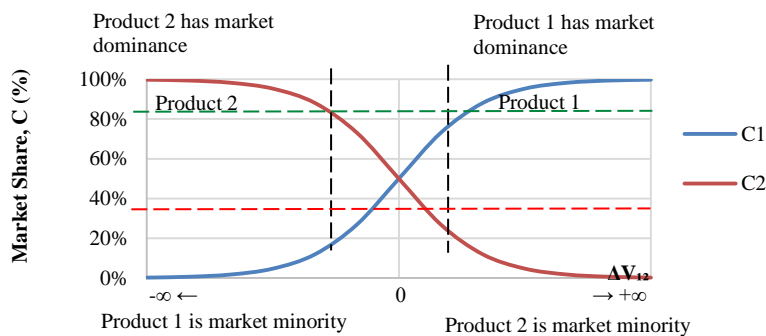


Figure 7. Distribution of product market shares of two competitive products as a function of the difference in their general values (Blue curve for product 1 and Brown Curve for product 2)

If the market share of a product rises above a certain level, the product becomes a dominant product in the market and may drive the competitive products off the market. On the other hand, if the market share of a product fall below a certain level, the product becomes a minority product and may fail in the market. Such dominance and minority levels are schematically shown in Figure 7. The dominance and minority levels of relative general values depend on the product, market, number of competitors, industry, degree of competition, access to inputs, and many other market defining parameters. The levels market share of 20% and 80% for minority products and dominant products are chosen arbitrary and used in this figure just for illustration.

Product positioning of dominant or majority products on the market, may dramatically impact on the business strategies of the companies producing those products.

8.2 Many Competitive Products without Consumer Constraints

Let’s generalize the approach developed above for two competing products to many competing products. Suppose there are a variety of N different competitive products presented in the market. Each product offers a certain general value V_1, V_2, \dots, V_N . Suppose V_0 is a commonly accepted benchmark general value for these group of products in the market. Then the market shares of these products could be expressed as

$$C_k = \frac{\exp(\theta\Delta V_k)}{\sum_{k=1}^N \exp(\theta\Delta V_k)} \quad \text{for } k = 1, 2, \dots, N \tag{14}$$

where ΔV_k is the difference of the general value of product k , V_k , and the benchmark general value, V_0 , i.e.

$$\Delta V_k = V_k - V_0 \tag{15}$$

and the sum of all market values of all competing products makes 100%, i.e. makes the entire market for that category of products,

$$\sum_{k=1}^N C_k = 1 \tag{16}$$

Figure 8 shows a schematic distribution of product market shares of four competitive products as a function of the relative general value of product 1 versus the benchmark general value, $\Delta V_1 = V_1 - V_0$ while other relative general values, $\Delta V_k = V_k - V_0$ for $k = 2, 3$, and 4 were held unchanged.

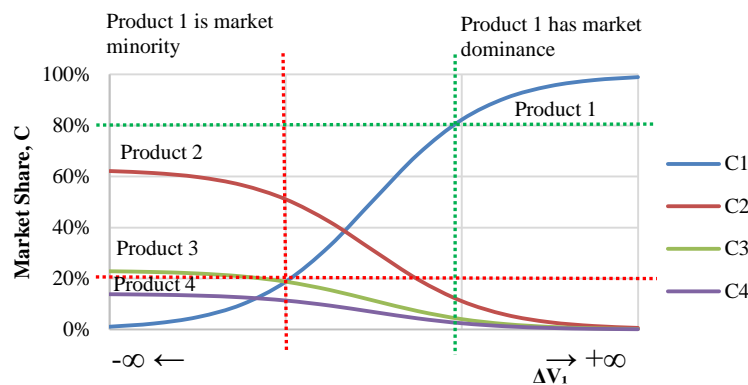


Figure 8. Distribution of product market shares of four competitive products as a function of the relative general value of product 1 versus the benchmark general value, V_1 , while other relative general values are held unchanged

It is important to note that the benchmark general value V_0 does not impact on the distribution of market shares of the products and plays a role of the reference point only. As soon as V_0 is equally present in the exponents in both, nominator and denominator in Eq.(14), the actual value of the benchmark general value, V_0 , does not play any role. The only significant role in the distribution of the product market shares is played by their relative general values.

As is evident from Figure 8, product 1 has extremely low market share if its relative general value is much lower relative to the other products and the product market share grows to the dominance level as its relative general value grows. On the other hand, other products gradually losing their market shares as the relative general value of product 1 grows.

Thus, the application of the Boltzmann distribution approach to the competitive analysis in the markets allows for the quantitative assessment of the competitive products and their market shares. The general values of the products play a role in the markets similar to energy in Physics.

9. Conclusions

General value is a sum of monetary and nonmonetary values (Aityan, 2013). In this paper, we analyzed market shares of competitive products based on their general values. Competitive products may have different monetary and nonmonetary components of value. Monetary value relates to the consumer perception of the product price and possibly, maintenance and final disposal. Nonmonetary value relates to the consumer perception of the product, product differentiation, quality, and other parameters impacting on the consumer satisfaction. The product price, cost of maintenance and possibly, final disposal contribute to the monetary value with the negative sign because these amounts leave the consumer's pocket, while nonmonetary value contributes the general value with the positive sign.

Different products may offer similar general values while show different monetary and nonmonetary components of value. If one product offers a low price and a low nonmonetary value but another product has the higher price and the higher nonmonetary value, their general values may be equal due to the balance of the monetary and nonmonetary components of value.

Consumers make their buying decisions based on the general value of the product, unless there are certain constraints on monetary or nonmonetary values. Thus, products compete by offering the higher general value.

If a firm pursues the cost leadership competitive strategy, the firm needs to reduce production costs but try to keep the nonmonetary value of its products at least closer to the level of its competitors to offer the highest possible general value offered by its product due to its low cost and hence, the price. On the other hand, if a firm pursues the differentiation strategy, the firm needs increase the product differentiation, but try to control their product price not to grow too high to compromise the product high general value. If a firm manages to pursue both, cost and differentiation leadership, the firm's competitors may be washed out from the market due to unmatched differences in the general values of their products.

The difference in general values of the competitive products impacts on the market share of the respective products. The higher difference of general values of the products, the greater is the difference in their market shares. The market shares of the competitive products exponentially depend on the difference of their general values. The exponential distribution of the market shares of competitive products on their general values is similar to the Boltzmann distribution in Physics, where general value of the products metaphorically plays the role of energy in Physics.

Consumer constraints such as monetary and nonmonetary constraints may change the market shares of the products due to the elimination of the products, which do not meet the constraint.

Thus, the assessment based on general value allows for quantitative approach to competitive analysis with the estimation of the market shares of the competitive products.

The economic meaning, interpretation, and composition of the exponential factor θ as well as the constrained-induced distribution by general value will be addressed in the next paper.

References

- Aityan, S. K. (2013), The Notion of General Value in Economics. *International Journal of Economics and Finance*, 5(5), 1-14. <https://doi.org/10.5539/ijef.v5n5p1>
- Aityan, S. K., Ivanov-Schitz, A. K., & Eugenia, L. (2017). Measuring the Nonmonetary Component of General Value for Goods and Services. *International Journal of Economics and Financial Issues*, 7(3), 69-81. Retrieved from <http://www.econjournals.com/index.php/ijefi/article/viewFile/4211/pdf>
- Aityan, S. K., Ivanov-Schitz, A. K., & Shankar, T. (2016). Measuring the Nonmonetary Component of General Value for Jobs. *Advances in Social Sciences Research Journal*, 3(4), 1-33. <https://doi.org/10.14738/assrj.312.2414>.
- Bertrand, J. (1883). Book review of *theorie mathematique de la richesse sociale* and of *recherches sur les principes mathematiques de la theorie des richesses*. *Journal de Savants*, 67, 499-508.
- Brown, C. (1980). Equalizing Differences in the Labor Market. *Quarterly Journal of Economics*, 94(1), 113-134. <https://doi.org/10.2307/1884607>
- Friedman, M. (1953). *Essays in Positive Economics*. Chicago: University of Chicago Press.

- Friedman, M., & Savage, L. J. (1948). The Utility Analysis of Choices Involving Risk. *Journal of Political Economy*, 56(4), 279-304. <https://doi.org/10.1086/256692>
- Gale, B. T., & Donald, J. S. (2006). *Value-Based Marketing & Pricing* (p. 1-19). Working Paper of Customer Value, Inc. Retrieved from <http://www.cval.com/pdfs/VBMarketingAndPricing.pdf>
- Kahneman, D., & Tversky, A. (2000). *Choices, Values, and Frames*. Cambridge University Press. <https://doi.org/10.1017/CBO9780511803475>
- Kahneman, D., Slovic, P., & Tversky, A. (1982). *Judgment under Uncertainty: Heuristics and Biases*. Cambridge University Press. <https://doi.org/10.1017/CBO9780511809477>
- Kahnemann, D. (2011). *Thinking, Fast and Slow*. Farrar, Straus and Giroux.
- Kreps, D., & Jose, S. (1983). Quantity Precommitment and Bertrand Competition Yield Cournot Outcomes. *Bell Journal of Economics*, 14, 326-338. <https://doi.org/10.2307/3003636>
- Rosen, S. (1974). Hedonic Prices and Implicit Markets: Product Differentiation in Pure Competition. *Journal of Political Economy*, 82(1), 34-55. <https://doi.org/10.1086/260169>
- Rosen, S. (1986). The theory of equalizing differences. *Handbook of Labor Economics (Chapter 12)*, 1, 641-692. [https://doi.org/10.1016/S1573-4463\(86\)01015-5](https://doi.org/10.1016/S1573-4463(86)01015-5)
- Samuelson, P. (1938). A Note on the Pure Theory of Consumers' Behaviour. *Economica*, 5, 61-71. <https://doi.org/10.2307/2548836>
- Schulak, E. M., & Herbert, U. (2011). Austrian School of Economics, Ludwig von Mises Institute.
- Simon, H. A. (1955). A Behavioral Model of Rational Choice. *Quarterly Journal of Economics*, 69, 99-118. <https://doi.org/10.2307/1884852>
- Skousen, M.(2005). *Vienna & Chicago, Friends or Foes?: A Tale of Two Schools of Free-Market Economics* (p. 306). Capital Press.

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