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VALIDITY OF INFORMATION BASED ON (CPV) ANALYSIS FOR THE NEEDS OF SHORT-TERM BUSINESS DECISION MAKING

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***Abstract*—**CVP (cost-volume-profit) analysis and the break-even point of profitability as its integral part are the most commonly used instruments for short-term business decision making. The theoretical basis of this concept is the accounting approximation on short term straight-line behavior of the total cost within a relevant range of activities. Information base for the construction of the break-even point of profitability provides the calculation of the variable costs. The model of the break even point is of quantitative, static and deterministic character. The conceptual paper is intended as a critical review of the theoretical assumptions of this model from the practical aspects of the application.

***Keywords*—**CVP analysis, profitability break-even point, the relevant range of activities, risk assessment.

I. INTRODUCTION

THE historical compromise arisen among economists and accountants in terms of cost behavior influenced the development of accounting practices and other analytical instruments that rely upon it. Using the assumption of straight line behavior of costs within the relevant scope lot has been done to make the operationalization of the theoretical learning so acceptable for everyday use.

The first part of the presentation is related to the broader economic and accounting concept of short-term cost behavior within the relevant range of activities. The essence of this concept is the premise of the short-term predictability of the behavior of costs within the relevant range of activities and allocation of total costs into fixed and variable component. Beside linear cost behavior this concept also implies linear behavior of incomes. These assumptions however theoretically founded, are based on a static concept that is not sustainable in a dynamic environment.

The second part of the paper is designed as a critical review of the methodology of calculations according to variable costs, which is based on the previously described pattern of behavior of costs and revenues. The focus of critical analysis is directed to the validity of accounting information for CVP analysis (cost-volume-profit), the basis of which is the calculation of the variable costs. This surely does not mean that other important elements are going to be neglected.

Finally, the paper critically discusses using the analytical method the theoretical assumptions of CPV analysis and its structural elements of the profitability break-even point and margin of safety. The critical assessment is mainly based on the assessment of validity of the relevant information for decision making in dynamic and risky business environment.

II. ECONOMIC AND ACCOUNTING CONCEPT ON FUNCTIONAL RELATIONSHIP BETWEEN COSTS, INCOME AND VOLUME OF ACTIVITY

The first question we will consider here is related to the behavior of costs in the short and long term. Short term refers to the period in which one or more inputs in production can not be changed. In other words, in the short term there is at least one unchanging factor of production, such a factor is called a fixed input, Robert and Daniel [15]. Long term is the time required to change all inputs. It is normal to expect that the decisions made in the short and long-term differ. In the short term, the focus is on changing the intensity of the usage of available factors of production and in the long term the focus is on changing the size of the capacity through additional financing in fixed assets. Operatively speaking, the determination of the short and long term is relative and depends on the individual characteristics of a company. In some branches of activity, this period can be up to one year, and in other branches of the seasonal character of production it can amount to a few days. Therefore, the first condition for the division of total costs between fixed and variable component is the cost observation in terms of the short term.

The second issue of this corpus is related to the accounting approximation of the straight line behavior of the overall costs and revenues. It is well known that economic theory teaches us that the behavior of the total cost and revenue is curved. With certain theoretical assumptions, within the relevant range of activities between the points Q1 and Q2, costs and revenues can have a linear functional dependence with respect to the scope of activities. Figure 1.

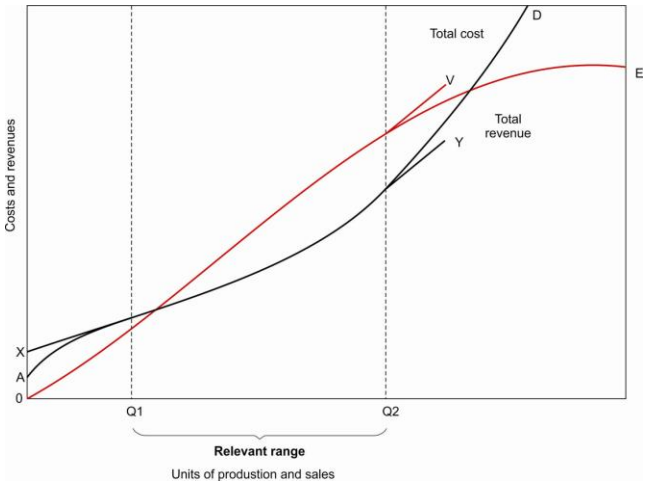


Figure 2: Linear CPV Relationships [4]

From the standpoint of the mathematical theory the support for this idea is found in the so-called tangent-line phenomenon, according to which each course withdrawn from the curve origin of total cost, is a straight line. It is logical to assume that this straight-line is convergent with the curve of the total cost if the relevant range of activities is narrower.

Accounting approximation of rectilinear motion of costs within the relevant range in terms of short-term brings the following benefits, Stevanovic [18]:

- allows rapid projections of total costs for alternative scopes of activities,
- equalizes marginal and average variable costs and thus makes them constant per unit for the relevant scope of activities and
- eliminates the progression of costs with a high degree of capacity utilization that is it moves the lowest average costs to the limit of practically achievable capacity.

The mentioned advantages of rapid visual projections can be applied to revenues as well. In addition, the approximation of the straight line behavior equalizes marginal revenue and average revenue and eliminates the digression of average income at high levels of activity, moving the economic optimum to the limit of practically achievable capacity.

In theoretical framework the relevant scope of activities is one area of employment within which the applicable requirements of the straight-line behavior of the total costs apply, etc., Meigs and Meigs [13].

Within the relevant area of activities, the total cost can be divided with respect to changes in the scope of activity in the fixed, variable and mixed, while fixed costs imply absolute fixed time costs whose reagibility level (r) with respect to changes in the volume of activity is equal to zero. The variable costs in this context imply only proportionally variable costs with the level of reagibility (r) with respect to changes in the volume of activity is equal to one. Proportional variable costs at the same time represent a working approximation of marginal costs within the limits of optimal capacity. Mixed costs referred to here are made of only the absolutely fixed and proportional variable costs. The inclusion of other inter-zonal mixed cost is not in this case theoretically expedient. More specifically, it is about the interzonal stepwise (relatively-fixed) costs that are of irrelevant nature for this topic, as they are the medium-term costs.

It is reasonable to assume that any theoretical learning, no matter how scientifically founded, carries certain ambiguities that can be seen in the practical application. Thus, for example, it is not clear what scope of capacity utilization may be considered a relevant scope that is the "relevant range" of activities. Some theorists believe that the scope of activities between 45% and 80% capacity, in which the supposition that the total cost are to move linearly with changes in volume applies, Meigs and Meigs [13]. The second group of issues consists of the problems related to the defining the scope of activities, especially in the production of mixed character (the production of material goods and services). The problem of quantifying the scope of activity occurs also in the production of a wide range, especially when the production costs are of different structure and cannot be expressed in terms of equivalent numbers.

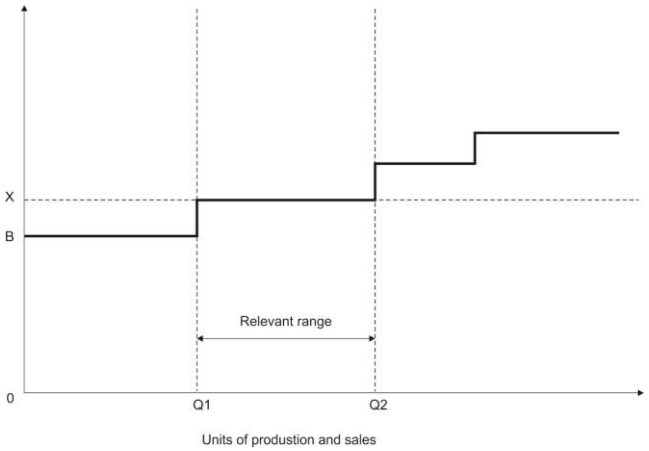


Figure 2: Fixed Costs Applicable within the Relevant Range [4]

Closely related to the definition of the scope of activities are the problems that arise in the choice of methodology for separating mixed costs into the fixed and variable component. In fact, none of the proposed methods gives exact results, and the very choice of

method is left to the experience of the observer, which can often be incompetent for the given job.

III. SHORTCOMING OF COSTS CALCULATION BASED ON VARIABLE COSTS AS AN INFORMATION BASE FOR COST-VOLUME-PROFIT ANALYSIS

The system of calculation according to variable costs with its methodology, which involves dividing the total cost to the fixed and variable component, presents a suitable information base for the requirements of CPV analysis. It is reasonable to assume that each methodology is based on certain assumptions which may also be the advantages and disadvantages of the system, depending on the point of observation, that is on the set goals. The objectives of calculation system per the variable costs are generally of managing character. In this sense, planning and cost control, as well as short term-alternative decision making are the basic objectives of the calculation system according to the variable costs.

Analytical review of key shortcomings of calculation system within the variable costs Theoretical cost curves are derived from the law of diminishing returns that is typical of industrial enterprises, which means that the fixed costs or their combination is an indivisible value and must be engaged in full or not at all. Under any short period, fixed costs remain unchanged compared to the fluctuations in the volume of activities, with very few adaptations that contribute to the optimal combination of all resources. However, one of the elements to explain the linear cost functions is the fact that fixed costs are characterized by a degree of divisibility, thanks to the fact that the plants and equipment consist of a large number of homogeneous units (physical divisibility). Additionally, plants and equipment is characterized by temporal divisibility and the fact that they can be used with greater or lesser intensity in the time available. As a rule, the greater the degree of divisibility of fixed factors, the greater the probability that the variable costs will be proportional. In other words, the divisibility of the fixed factors enables the management bodies, to optimally combine the fixed and variable elements within the relevant range of activity. Furthermore, it should be noted that the accounting fixed average variable costs are only an approximation of the marginal costs of economic theory, under conditions that the factors that determine the functional linearity of total costs actually really work.

Calculations of cost and financial results, based on the variable costs are a limiting factor of this methodology for long-term business decisions- making. This is precisely because, as variable costs and operating profit are expressed in marginal gain (contribution result), the main objective of the short term in which the company is trying to cover fixed costs and realize the net gain by maximizing the marginal profit. In the long run the system is inapplicable because the long-term strategy is based on respect for the total cost till coverage of the full cost price.

The calculation of the variable costs is mainly based on accounting data which are quantifiable. By orientation on quantitative information, nothing has been done to eliminate the qualitative factors that are not related to costs and that affect the quality of decision-making. However, the theoretical assumption of the non-costs constancy factors, an effort is made to eliminate the business risk posed by the qualitative elements. However, the reality is far from this assumption. In fact, only one qualitative factor may reduce or annul the results of the analysis based on quantitative information. The overemphasized impact of qualitative non-cost related factors in all cases relativizes and diminishes the role of the calculation system on the variable costs in the field of business decision making, Malinić [12].

One of the limitations of calculation system on the variable costs is related to the cost structure and contribution of each individual element of the structure to the total revenue of the company. The relatively low share of fixed costs, while simultaneously generous profit, leads to the difference between marginal profit and net profit is not that significant. It follows that it does not matter from which point of view we make business decisions, as there is no significant difference between the marginal and net revenue, and therefore there is no risk to make a significant error in the decision making. However, current economic conditions are characterized by reduced participation of the net results in the sale price and the increased share of the fixed costs in the price cost and total revenues, which results in relatively stagnant variable costs in the structure of total costs and revenues. In such a constellation of the dominant structures of fixed costs, it can be concluded that the application of the calculation system on the variable costs when making business decisions is justified.

In addition to these limitations in the literature also discussed are other deficiencies that can be systematized as, Catherine [3]: dominant share of service industries in the economy of developed countries makes the calculation system on the variable cost become less important, the level of the relevant volume of activities is difficult to assess, the fluidity of the boundaries between fixed and variable costs and problems associated with the determination of base activities in the production of mixed nature (material goods and services).

In the operative sense, the system of calculating within the variable costs is burdened by the arbitrary problems in separation of the total costs to the fixed and

variable component. The problems of arbitrariness are associated with the determination of the activity base, especially in multiphase production of non-homogeneous products with different cost structures and the time needed for their operationalization. In some areas of production with irreversible processes and the production of discontinuous character determining the activities' base can be set in even sharper terms.

IV. THEORETICAL FOUNDATION AND VALIDITY OF DECISION MAKING PROCESS DECISIONS BASED ON THE ANALYSIS OF BREAK-EVEN POINT

Analysis of the interdependence of the cost-volume-profit (CVP analysis), is incorporated into the system of calculating the variable costs. In fact, the system calculation within the variable costs rests on a contribution theory of managing business outcome and its methodology encompasses the successful combination of costs and sales volume in order to optimize financial results. The cost-volume-profit is operationalized through the critical break-even point of profitability. Break-even point is usually defined as the volume of production and sales, or a moment in time of activities, in which the revenue from the sale covered total costs (variable and fixed), and the financial result is zero. Break-even point can be mathematically calculated and graphically presented with certain conditions. For our further analysis we consider more useful to graphically display the break-even point.

According to some, undoubtedly, great authorities in the area of cost management, CVP analysis cannot be imagined without the following assumptions; Alnoor, Strikant,Charles and Madhav [1]

1. Total costs can be divided into the fixed and variable component, respecting the level of activity,
2. Behavior of total revenue and total cost is linear in relation to the volume of activities within the relevant range,
3. The selling price per unit, unit variable and total fixed cost are known and unchanging.
4. The analysis refers to a product, and if there is a wider range of products, the implementation structure is constant,
5. Total costs and revenues are facing each other without involving the time value of money,
6. Changes in the level of revenues and costs should be treated as the consequence of changes in the number of products or services that are produced and sold. Number of manufactured units of products (services) is carriers of revenues and costs.

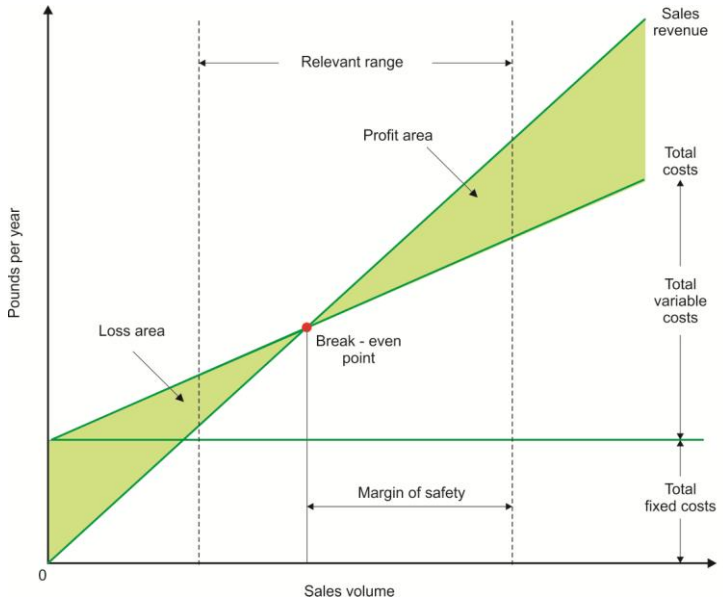


Figure 3: Cost-Volume-Profit Graph [5]

In addition to these assumptions other can be made, such as: stability of the general price level, unchanging labor productivity, the overall synchronization between production and sales is indisputable, and also the principle of reagibility costs (fixed and variable).

The main purpose of CPV analysis and profitability break-even point is to provide information to the management in planning the target profit within the relevant range of activities under conditions of short-term. In other words, the analysis based on the volume-cost (revenue)-profit shows what is the amount of product (service) that needs to be sold in order to cover total costs with revenues from sales and achieve desired positive results, or what is the level of business activity to be achieved in order to cover the entire fixed costs by the contribution margin and achieve the planned positive result. In addition to these primary goals using CVP analysis we can get the answers to questions such

as, Drury [5]: what will be the effect on profits if we reduce the selling price or increase the number of product units sold, for how much to increase profits so that we cover the additional fixed cost caused by increased advertising costs, and finally, how should we pay employees a fixed salary or on the basis of participation in the achieved result.

Based on the data of the CPV analysis, we can also get answers to other questions in the field of measuring business risk, such as determining the limits of safety and degree of operating leverage. In order to illustrate the theoretical learning in our further presentation we will present some concrete examples where we show the application of CVP concepts for business practices.

Calculation of breakeven point made by marketing managers is baes on the cost analysis of the operations and programs, with a strategic and operative view on the real expenditures and achievement of the high yield onf investments Enyi [6], Jacobs [9]. This view is position the CVP analysis in the proper context of marketing and strategic business planning. Practical approach to breakeven analysis is enabling to define the point of optimal output levels to cover the fixed and variable costs as it has being clearly demonstrated by Bashir, Batool and Rizvan [2], also by Steenburgh and Avery [17].

V. PRACTICAL QUANTITATIVE APPLICATION OF THE ANALYSIS OF BREAK-EVEN POINT

On the following hypothetical example we will analyze the break-even point producing a product by selling it for 250 monetary units (dinars) per unit. We obtain the current production of a company expressed in units of Q, dividing the total sales in dinars (5,000,000) by the selling price per unit (P = 250), which gives the amount of 20,000 units per year. Its annual unit variable costs V is determined by dividing the total variable costs (3,000,000) with the current production (Q = 20,000) in order to get 150 dinars per unit of variable cost.

Applying the general equation to calculate the break-even point expressed in units of the product: VanHorne and Wachowicz [19]:

$$Q_{BE} = \frac{FC}{P - V} \quad \textbf{(1)}$$

Assuming that the fixed costs of the company FC are given in the amount of dinars 1,000,000. Substituting these numbers into the equation the following break-even production volume expressed in units is obtained:

$$Q_{BE} = \frac{1.000.000}{250 - 150} = 10.000 \text{ unit}$$

The company's break-even point can be determined graphically as in **Figure 4.** As can be seen from this graph, the level of break-even point of sale is 2,500,000 dinars.

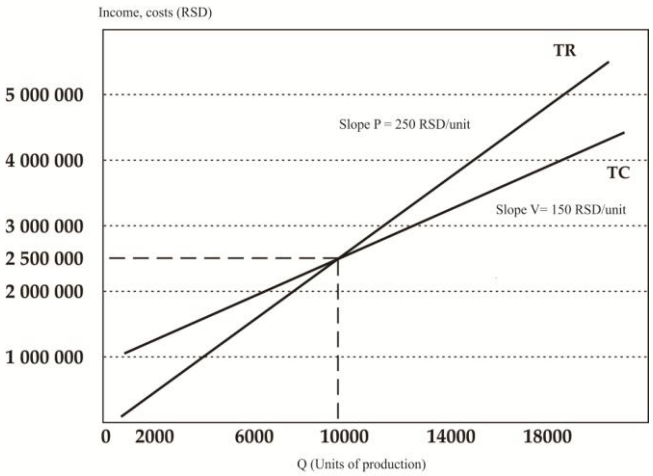
Since the break-even point of the company's production depends on many variables – especially on the price per unit and variable (operating) costs per unit - the company may wish to analyze the effects of changes in either of these two variables to the break-even point of production.

For example, the problem can be considered as follows. If you increase the selling price per unit for 25 dinars, that is at 275 dinars P'.

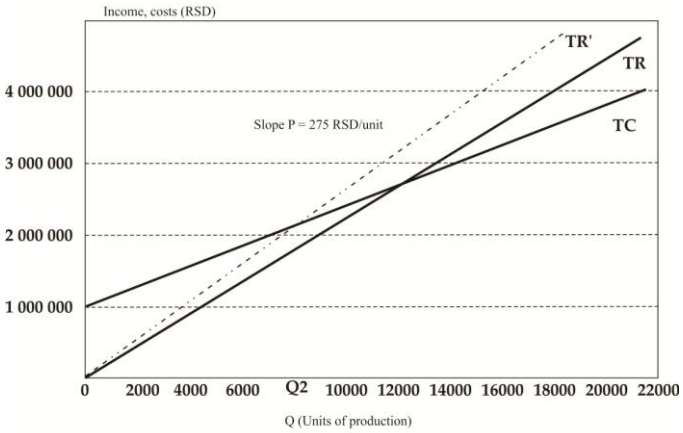
Substituting these figures in equation 1 we get a new break-even point of production:

$$Q_{BE} = \frac{1.000.000}{275 - 150} = 8.000 \text{ unit} \quad \textbf{(3)}$$

This can also be seen in **Figure 5**, where an increase of the selling price per unit increases the slope of the total revenue **TR'** function and reduces the break-even point of production.



Graph 4: Analysis of the Linear Break-even Point [10]



Graph 5: Analysis of the Linear Break-even Point Demonstrating the Effect of Price Increase, [10]

Rather than increasing the selling price per unit, managers may decide that in some parts of its businesses replace (substitute) fixed costs with the variable ones.

One example when labor costs rise is that the management may decide to replace living labor with machinery and that the fixed costs of capital equipment replacement variable labor costs.

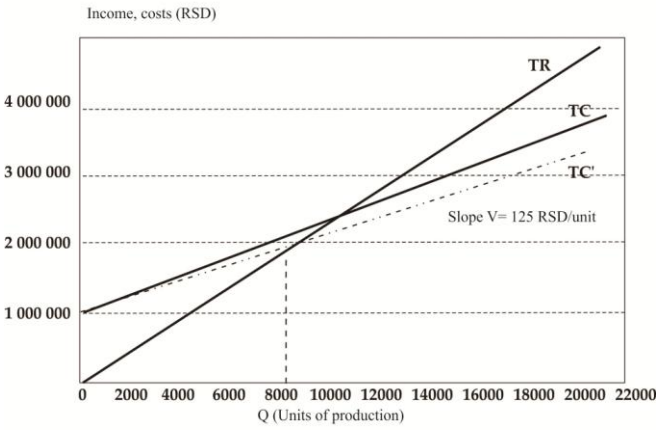
Suppose that by the purchase of accessories for dinars 1,000,000 labor costs per unit may decrease by dinars 25.

Suppose that the new equipment is depreciated for 10 years, using the method of linear depreciation under stable monetary conditions.

Under these conditions, the annual depreciation would amount 1.000.000/10 = 10.0000 RSD. Variable costs per unit **V'** would be 150-25 = 125 dinars. Substituting P = 250 dinars per unit, V' = 125 dinars per unit, and F' = 1,100,000 in equation 1 a new break-even production volume is obtained:

$$Q_{BE} = \frac{1.100.000}{250-125} = 8.800 \text{ unit} \quad (4)$$

As can be seen in **Figure 6** the effect of these changes in the business is raising the starting point on a vertical line, reducing the slope of the total cost **TC'** function and lowering the break-even point.



Graph 6: Graphical Depiction of the Break-even Point which is Demonstrating the Effects of the Substitution of Fixed Costs with Variable Costs [10]

VI. ANALYSIS OF BREAK-EVEN POINT AND ASSESMENT OF RISK

The information provided by the analysis of break-even point can be used to assess the operational risks to which the company is exposed. Let us consider the example of **Figure 6.** With fixed costs of RSD 1,000,000, the price per unit of RSD 250 and variable cost per unit of 150 dinars, it was calculated that the break-even volume of production (output) is 10,000 units. If to this group of information we add the **expected** (mean) level of sales (in units) for a certain future period of time, the standard deviation of the distribution of sales and the assumption that the actual sales is approximately normally distributed, that is, that it has a statistically normal schedule, it is possible to calculate the probability that the company will have operating losses. This means that it will sell fewer units than its break-even point is. It is then possible to calculate the probability that it will achieve operating profits, which means that it will sell more units than the break-even level.

For example, if the expected level of sales is 15,000 units, with a standard deviation of 4,000 units, the probability of achieving operational losses (which is the probability of selling less than 10,000 units) can be calculated using equation 5 and the probability values from Table V.

$$z = \frac{10.000 - 15.000}{4.000} = -1{,}25$$

In other words, the sales level of 10,000 units is by 1.25 standard deviations below the **mean**. From V financial table it can be seen that the probability for -1.25 standard deviation is 10.56 percent. Hence there is a 10.56 percent chance that the company will achieve operating losses and 89.44 percent (100 percent less of 10.56 percent chance of loss) chance that the company will record operating profits. In the case of profit - gross profit means that it will sell more than its level of break-even point of output units is.

In the context of this paper two important elements of risk assessment may be cited, such as the margin of safety and the degree of operating leverage. Based on the previous data we will show a way of calculating them.

The fixed costs (FC) are given in the amount of 100,000 dinars, the sales price per unit is P=250 and variable costs per unit V=150 din. Break-even point is quantitatively expressed as QBE=10,000, as we have already calculated. Assuming that the company has reached volume production of Q = 15,000 the margin of safety should be calculated as the scope of activities for which the company can reduce its activity, while still not entering into the loss zone.

We will start with the general equation which is:

$$MS = Q - Q_{be}$$

By a simple substitution of the original data, we have

MS =15.000 -10.000= 5000

In this case, the company can reduce its scope of activities for 5000 units Q, while still not entering into the loss zone. Generally, the larger the range of margin of safety within the relevant range also means less risk that the company will move from the positive to the negative zone of operations.

The degree of operating leverage is also one of the indicators for measuring risk exposure. In general terms it shows percent change in business profits in relation to changes in production (or sales). For operational purposes quantitatively expressed the degree of operating leverage (DOL) can be expressed by the general equation, VanHorn, Wachovicz [19]

$$DOLQ_{unit} = \frac{Q}{Q - Q_{BE}} \quad \textbf{(8)}$$

replacing the previous data in the equation we get the following

$$DOLQ_{unit} = \frac{15000}{15000 - 10000} = 3 \quad \textbf{(9)}$$

In this particular case the degree of operating leverage has a value of 3. Generally, the scope of current activities is farther from the profitability break-even point, the degree of operating leverage as an indicator of risk exposure is smaller and asymptotically approaches to one. In theory it is related to cost structure and ratio of fixed costs to the realized operating profit (EBIT). When this theoretical statement is applied to concrete data from our previous example, where QBE was equal to 8800 units, and in which we discussed the impact on the substitution of costs to the position of the break even point, we get the following result:

$$DOLQ_{unit} = \frac{15000}{15000 - 8800} = 2{,}42 \quad \textbf{(10)}$$

Based on a comparative analysis of these two cases we can conclude that the substitution of factors is made rationally and resulted in a reduction of both fixed and variable factors measured per unit of marginal utility. At the same time it can be concluded that after the substitution of production factors there has come to decrease in the degree of operating leverage from 3 to 2.42. Furthermore, this aspect of measuring risk exposure is not inconsistent with the results obtained from the margin of safety (MS), as in the second case when the substitution of factors of production has been performed there has come to a shift of the break even point towards the ordinate (Y axis), and thus to increase of marginal margin of safety.

VII. LIMITATION OF THE THEORETICAL ASSUMPTION OF THE CPV ANALYSIS IN PRACTICE

The problem of CPV analysis limitations can be set in a wider and a narrower sense. In a broader context, the limitations related to the theoretical assumptions, while the narrower concept can be viewed from the perspective of the difficulties related to the operationalization of the model in economic practice.

In essence, the theoretical concept is the assumption on a linear functional dependence of the costs and scope of activities in the short period of time, within the relevant range of activities. Thus, only in that range of activities and in the short run, fixed costs are absolutely fixed (unchanging temporal costs) and variable costs are constant per unit of product and are increasing in the mass in changing the scope of activities. The relevant range is here equated with one zone of employment from which it follows that the term mixed costs applies only to costs that appear as a combination of absolutely fixed and proportionally variable costs. Practical problems may arise here about it, how to determine the relevant range of activity, that is what is the level of capacity utilization that may be considered as the relevant range. Naturally, it is logical to assume further that the broader the scope of relevant activities implies larger errors in the determination of cost behavior for tangent line phenomena on a straight-line approximation of the theoretical cost curves. Furthermore, in theoretical terms a relevant range is the range of the optimal combination of all costs and revenues which provide maximum marginal gain. It is reasonable to assume that a wider range of relevant activities, divisibility of fixed costs and a longer time interval are favourable to optimizing company resources. In contrast, the narrower the relevant range, the indivisibility of fixed costs and a shorter period of time have the opposite effects. Limitation of theoretical assumptions consists precisely in the fact that the choice itself of relevant range and time frame is determined both by the internal and external factors and cannot usually be correctly identified and adapted to the practical needs.

CVP analysis model is essentially quantitative-static. In fact, it operates with constant and measurable economic categories such as: sales mix, zero inventory, sales prices, total costs and marginal margin as the sole criterion of optimization of costs and revenues. This behavior of financial indicators can be found only conditionally in free competition markets. In the modern world, the situation is quite different. According to research conducted in Korea, Japan and the United States the contribution margin as a financial indicator for achieving goals is ranked lower, with the exception of Japan economy, than the gross margin, sales growth and inventory levels, Figar. [6]. For these reasons, this method of treating of key business indicators carries a huge amount of hidden risks that were not anticipated in the model.

Although the very graphic representation of the area in which profitability break-even point is located seems quite clear and homogeneous, more subtle theoretical analysis denies it. More specifically, the graph does not include the significance of the cost structure in terms of CVP analysis. Namely, the prevailing structure of variable costs relative to fixed gives this instrumentation less importance than the situation when the structure of the fixed costs is dominant. Furthermore, the prevailing structure of variable costs makes the break-even point of profitability closer to the ordinate (Y-axis), which implies a greater margin of safety and flexibility of profit in relation to the change in sales volume. In contrast, the dominant share of fixed costs in the total costs structure has as a result a narrower range of margin of safety and less flexibility of profit in relation to changes in sales volume that is a higher degree of operating leverage (DOL) as an indicator of business risk. The degree of operating leverage (DOL) as a measure of sensitivity to changes in profits compared to changes in sales volume can be expressed by the equation: DOL= marginal

margin: EBIT (gross profit before tax and before deduction of interest). From the equation presented, we can conclude that all the elements that can be associated with business risk management (sales volume, the level and structure of costs) are excluded from the concept of break-even point, because they are considered constant or independent variable. It is reasonable to conclude at the end, that these theoretical assumptions in real economic life are unsustainable. The thesis of the constancy of revenues and costs is not sustainable in the modern business environment where companies have a high proportion of fixed costs and a high degree of operating leverage (DOL). In such conditions, or market conditions, when the supply dominates the demand, it is difficult to believe that the management will not lower selling prices and costs, especially at a time when sales decline tends to undermine profitability.

It is an illusion to assume that the business policy with regard to the structure of production range will be the same before and after reaching the profitability break-even point. Namely in business until the profitability break-even point production capacities are not used enough and the management of the company will accept all orders whose purchase prices are above the variable costs. After the scope of activities, the company management will make a selection of the product range and focus its business on the most profitable orders. For these reasons, the assumption of constant range within the relevant areas of activity is not sustainable.

In accounting terms, the financial results calculated on the basis of variable costs are not correct. More specifically, the treatment of total fixed costs as expenses in the period results in an underestimation of the financial results for the range of activities to the break-even point and the overestimation from the break-even point to the extent of relevant range. However, zero inventory levels (matching production and sales) make the financial results at the end of the period within the relevant range correct. Nevertheless, this does not refute the theory of inhomogeneous area in which costs-volume-profit is analytically presented as the structural elements of CPV analysis.

VIII. CONCLUSION

This paper comprehensively examines critically the applicability of quantitative information of CPV analysis (cost-volume-profit) in business practices. The concept of CVP analysis relies mainly on the information of calculation on the variable costs, deriving quantitative data on costs and revenues mainly from financial accounting. CPV analysis and break-even point has been known to theorists even before the onset of calculation on the variable costs. However, with the emergence of calculation on the variable costs a solid information base has been created for its application in the field of short-term business decision making.

Naturally the very accounting methodology on the variable costs is based on theoretical assumptions about the behavior of the short-term costs within the relevant range of activity volume and share of total costs into the fixed and variable component. Operationally, the division of costs into the fixed and variable component is often made difficult because of the well known problem of the choice of base of activities about which the paper discusses among other issues. The choice of base of activities and methodologies for separating mixed costs into fixed and variable components constitute a single body of initial problems affecting the validity of the information obtained.

CPV concept analysis is essentially quantitative-static model. The majority of financial indicators that could affect the financial result (marginal margin) are considered to be constant. More specifically, the assumption of the constancy of revenues, total costs, marginal results and the structure of the portfolio in real economic life, are not sustainable. This is primarily because in modern economy, the supply dominates the demand and it is not a logical assumption that the financial results (marginal margin) will depend only on the quantity of produced (sold) goods. Consequently, the paper critically examines the impact of certain limitations that may affect the quality of decisions in a dynamic business environment. Furthermore, this model, like all quantitative models, does not include qualitative non-cost related elements, which can be of a significant impact on the quality of information and business decisions made based on them.

Generally, the results of CVP analysis can be applied only to short-term decision making in business, within the relevant range of activities and in the situation of insufficient capacity utilization. For long-term business decision making, this model is absolutely inapplicable, because many assumptions on which it rests from the point of view of long term, are not acceptable.

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