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TÍTULO: Modelo de línea de equilibrio: adición al sistema de costos directos.

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RESUMEN: La relevancia del problema en estudio está condicionada por la necesidad de eliminar los defectos en los modelos económicos y matemáticos basados en costos directos. El propósito del artículo es probar la hipótesis, según la cual la agrupación de costos corporativos diferentes ayudará a eliminar los inconvenientes del sistema actual de costos directos. El estudio ha dado como resultado una expresión analítica (algebraica) del modelo de línea de equilibrio que confirma la efectividad de la modificación del sistema de agrupación de costos y prueba la existencia de la hipótesis. La inclusión de las condiciones del sistema tributario nacional en el modelo de línea de equilibrio ofrece nuevas oportunidades en la valoración de la solvencia de la actividad empresarial en varios sistemas tributarios.

PALABRAS CLAVES: costos fijos y variables, sistema tributario nacional, gastos en servicios de terceros, gastos de nómina, evaluación económica de decisiones gerenciales.

TITLE: Break-even line model – addition to direct costing system.

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ABSTRACT: The relevance of the problem under study is conditioned by the need to eliminate the defects in the economic and mathematical models based on direct costs. The purpose of the article is to test the hypothesis, according to which the grouping of different corporate costs will help eliminate the drawbacks of the current system of direct costs. The study has resulted in an analytical (algebraic) expression of the equilibrium line model that confirms the effectiveness of the modification of the cost grouping system and proves the existence of the hypothesis. The inclusion of the conditions of the national tax system in the equilibrium line model offers new opportunities in assessing the solvency of business activity in several tax systems.

KEY WORDS: fixed and variable costs, national taxation system, expenses on third-party services, payroll expenses, economic evaluation of managerial decisions.

INTRODUCTION.

According to famous Russian researchers (Sheremet, 2008), profit earning simulation is impossible without cash accounting. Since accounting spawned in ancient Rome, it would be logical to date the origin of profit earning simulation from ancient times, too. We will not dispute over the reliability of this affirmation with professional historians. Instead, we will focus on the well-known facts that describe the first algebraic and graphic constructions based on cost accounting. It is commonly assumed that Blaug, 2005 was the first to suggest dividing costs into fixed and variable and that J. Harris (1981) combined them into a model that describes profit earning conditions (direct cost) in 1936.

The direct cost system has become common use at enterprises of Europe, North America, Russia. Proposals for dividing costs into fixed and variable are being constantly improved (Brealey, 1997). There is an ongoing discussion concerning the structure and composition of both fixed (Hese, 1903; Borner, 1961) and variable (Dr. Brown) costs. Utmost importance of high integrity of accounting

information (Levitt, 1998; Beneish, 1999) is underlined and methods to identify fraud (Beneish, 1994) are put forward.

Practical cost grouping into variable costs has different names in various countries; for example, in the US, it is referred to as direct costing (Malitskaya et al, 2015) , in Great Britain – marginal cost accounting (Bychkova et al, 1998); in Germany – partial limited cost accounting or "Break-Even-Analysis" (BEA model) (Martin, 1989); in France – marginal accounting (la comptabilite marginale) (Luc Arrondel, 2001); in Japan – cost management system (Ohno, 1988).

In Russia, division into fixed and variable costs has yielded the most synonyms: "break-even point accounting model", "costs–volume–profit model", «CVP analysis".

Principles of the direct costing system have given rise to a host of models that consider drawbacks and underline the benefits of their ancestor:

- Activity Based Costing (ABC) (Kaplan, 2005);
- Target Costing (TC) (Hese, 2000);
- Strategic Cost Analysis (SCA) (Imai, 1986);
- total life-cycle cost accounting (TLCC) (Stewart, 2008);
- DuPont model, including banks (Blumenthal, 1998).

Practical application of cost estimates of more complex mathematical calculations provides for the use of:

- fuzzy-set theory (Dechow, 2010);
- correlation analysis (Danilov, 2009);
- theory of probability (Slavin, 2015; Mikhailova, 2011);

It is important to underline that the author recognizes the mathematical description of processes (production, financial, managerial) aimed at profit earning as economic models. A special feature of economic models is that "predictability and prediction quality is more important than the

assumptions included in them (Fridman, 1994)". The author takes sides with J. Tinbergen (1940) in his debate with J. Keynes (1939) and recognizes the following as requirements imposed on economic models:

- need to minimize the number of elementary equations"; (Tinbergen, 1940);
- description of special (ideal) cases (Cartwright, 1945);
- experimentability (Lucas, 1980).

Application of the break-even point (direct cost) accounting model to the economic model building principles provided is viewed as quite difficult. This has resulted in a hypothesis, according to which different corporate cost grouping when simulating profit earning may yield a different model able to more fully meet the above requirements. To test the hypothesis, the study aims at scientific substantiation of the corporate cost grouping that would offer more options for managerial decisions. The following scientific tasks were settled to reach the set objective:

- substantiate cost grouping based on the rules established by the national economic system;
- propose analytical (algebraic) expression of the economic model and its graphic presentation;
- define the area of the most efficient application of the economic model that described the process of earning profit from entrepreneurial activities.

DEVELOPMENT.

Study methods.

These studies have been conducted using logic, elementary algebra, and analytical plane geometry methods.

Study results.

The break-even line model proposed for consideration has been conceived as a tool capable of overcoming the drawbacks of the break-even point accounting model, primarily the ones related to

difficulties when dividing costs into fixed and variable. These drawbacks have been eliminated. However, to do so, we had to give up on the possibility to directly study the effect of sales (labor capacity) on entrepreneurial activity efficiency indicators.

The break-even line model has been built with the principle of bifurcation point with zero profit ($C_D = 0$) preserved. Major changes include the brand new division of costs into three groups: expenses on third-party services, payroll expenses and taxes and compulsory payment expenses. While expenses on third-party services and payroll expenses are set by organization managers, the amount of compulsory payments and taxes is established by the national legislation. This cost grouping ensures faster and more accurate valuation of changes in tax laws and helps elaborate the corporate policy with regard to the payment for third-party services and labor remuneration.

It should be noted that the break-even line model is based on the output price structure or proceeds received by the enterprise. Both approaches are intended to ensure practical application when making cost estimates to analyze anticipated profit margin.

Scope of application of the break-even line model.

Before we describe the model, we would like to introduce certain restrictions. These restrictions are needed to simplify the analytical view of the model and ensure the most vivid demonstration of its advantages over the direct cost system (division of costs into fixed and variable).

The reason behind these restrictions comes from the existing practice of fixed assets taxation (property used to earn profit) and related depreciation accrual procedure. Most taxation systems used in Europe, North America and Russia, that contain corporate property tax, define residual (balance sheet) property value as a tax base. This value is determined by the property present value balance and accrued depreciation. Accrued depreciation accounting involves the biggest difficulty when describing the models used to determine property tax liabilities of enterprises. Arithmetically, everything is simple:

where C_F is the property initial cost (property cost accounted for as of the creation date of the property used for profit earning);

- is the value of corporate property tax liabilities;

- is the corporate property tax rate established by national tax laws;

- t is the usable time of the business property (number of time intervals);

- C_{At} is the depreciation amount accrued as prescribed by national tax laws.

With most national laws, the owner of the property used for profit earning is granted a right to affect the usable time and choose the established depreciation calculation procedure (in Russia, for example, using the linear or non-linear method). The resulting model capable of considering the effect of the value of property tax liabilities comprises so many variables that they adversely affect the possibility to present results both in analytical and graphic form.

Apart from the above complications, a share of expenses allocated by the enterprise for property tax payment does not exceed 2–3% of proceeds in most cases. This statistics justifies neglect of corporate property tax liabilities.

As for accrued depreciation, tax laws of most countries oblige corporate management bodies to accumulate depreciation charges in order to secure timely asset replacement. Three case scenarios are possible under these conditions:

- scenario 1 – depreciation in unit time "t" (C_{At}) is lower than the gross profit earned over time "t" (C_{Dt}), $C_{Dt} > C_{At}$, thus, net profit is above zero $C_{DD} > 0$;

- scenario 2 – depreciation in unit time "t" (C_{At}) is equal to the gross profit earned over time "t" (C_{Dt}), $C_{Dt} = C_{At}$, thus, net profit is equal to zero $C_{DD} = 0$;

- scenario 3 – depreciation in unit time "t" (C_{At}) is higher than the gross profit earned over time "t" (C_{Dt}), $C_{Dt} < C_{At}$, thus, net profit is below zero $C_{DD} < 0$ and the enterprise is recognized as loss-making with positive financial operation profit.

The depreciation value may have a pronounced effect on the figures describing activities of the enterprise. Since the accrued depreciation value is normally subject to the decision made by the financial management of the enterprise with regard to usable time and accrual method, the break-even line model has to consider the above peculiarities. Thus, it is possible to build a model that would reflect peculiarities of entrepreneurial activities with regard to peculiarities of ownership of the property used for profit earnings applicable to a particular enterprise.

In order to avoid the above complications, we will define the scope of application of the break-even line model by the enterprises that own no property used for profit earning. These enterprises are commonly referred to as “exempt from property tax” (absence of property tax liabilities in most cases does not provide for taxable profit reduction by the accrued depreciation value in national tax laws). The range of such enterprises is quite broad. They include most small businesses and leasing company clients (provided that the leasing subject is accounted for at the leasing company), tenants. Restriction of the scope of application of the model does not restrict simulation capabilities. Property taxation accounting is easy to describe in mathematical terms. The restriction is needed to simplify the model for the clearest presentation of its potential.

Initial data for break-even line model description.

Initial data used to build the break-even line model are the indicators that describe competitive power of products (sales or proceeds of the enterprise), business environment set by the government (taxation system as a sum of taxes and compulsory payments) and expenses on third-party services (costs of the enterprise) and payroll expenses (labor cost).

All the indicators used in the break-even line model may be presented graphically.

Sales proceeds (from goods of services, C_V) in the break-even line model is not related to the output unit volume price. On the one side, this approach extends and simplifies model use

irrespective of the range of the products sold and (or) services provided. On the other hand, it denies the opportunity of evaluating a very important indicator – 'sales volume in physical terms".

Proceeds of the enterprise (C_V) in the break-even line model is the sum of monies credited to accounts of the enterprise under "purchase and sale" or "services" contracts. It is not recommended to include monies credited under loan (credit) agreements or as dividends on investment of capital (in securities of other enterprises or deposited with banks or financial companies) in calculations of the proceeds value. The listed indicators may be used for financial analysis of activities of the enterprise, the conceptual part of which is beyond the scope of this work.

When calculating the value, proceeds may be increased by the amount of accounts receivable if so desired by the researcher. From the author's point of view, accounting for accounts receivable in terms of proceeds may yield more reliable results if the break-even line model is represented as a probability model. However, considering the aim and scope of this work, no probability break-even line model is considered as it requires readers' special additional training in the theory of probability, which is very time-consuming.

The most reliable value of proceeds of the enterprise may be derived from bookkeeping accounts. Let us underline once again the need to account for the transactions related to sale of goods or services only, while accounting for, for example, sale of business property (or its part) is not recommended.

Expenses on third-party services (C_Z) include the acquisition of goods or services, except for the property intended for profit earning. There may be situations when property acquisition costs have to be accounted for, for example, acquisition costs of the assemblies or parts that add value to property and are required to keep processing equipment in working order. Besides, repair and maintenance of equipment that are classified as operating costs and are included in the property operation cost should also qualify as costs.

When determining expenses on third-party services, laws (rules of doing business) provide for the delimitation of goods (services) acquired from VAT paying enterprises and suppliers that use special tax treatments (VAT-exempt). If goods (services) are bought from a seller belonging to the sector of special tax treatments or VAT-exempt seller, tax liabilities vest with the buyer. In other words, when acquiring these goods, the buyer has to remember that their actual value will increase by the amount of output VAT and then input VAT. If applicable national tax laws provide for multiple VAT rates, when buying goods (services) at different VAT rates, cost are kept for the goods matching each applicable tax rate.

In the break-even line model, expenses on third-party services reflect the total value of costs over the set time interval. No costs per unit volume of output and (or) sold products are calculated. This approach simplifies the cost measuring procedure, for example, under book entry accounts and ensures highly reliable assessment of the current situation of the enterprise. It is important to note that the use of the summary indicator of expenses on third-party services may enable quite efficient monitoring of the use of financial resources, first of all, when performing the managerial tasks aimed at successful management of production and non-production inventories.

Note that it is recommended to ignore expenses of the enterprise on the acquisition of property, including the one intended for profit earning and expenses not related to core activities of the enterprise, for example, costs on financial market placement of free cash in the model. This is due to the fact that, firstly, property is normally acquired using net profit of the enterprise (acquisition using a bank credit implies repayment, in most cases, also using net profit); secondly, when non-core operations are performed, the break-even line model may be built using the data that describe, for example, peculiarities of operations of enterprise on financial markets (placement of securities of free financial resources).

Accrued wages (C_R) include payroll expenses of all worker groups at the enterprise (directly relating and not relating to production of goods or provision of services). A peculiar thing about the value of this indicator lies is that its comprises expenses on personal income tax and expenses that exceed the value of accrued wages by the amount of payments to the compulsory social insurance system established by applicable tax laws.

The practice of defining payroll expenses proves that the most convenient form of representation of these expenses is the value of accrued wages (C_R) multiplied by the factor that matches the amount of employees' compulsory social insurance liabilities. Thus, the baseline value for determining payroll expenses is accrued wages (C_R) multiplied by the factor, that determines the amount of employees' compulsory social insurance contributions. As a result, to determine total payroll expenses, it is enough to calculate the product: C_R (1 +). This presentation comprises all the expenses of the enterprise, including personal income tax ($C_{RS} = C_R$).

In certain cases, it is feasible to use the value of the wages delivered to employees (transferred to personal accounts with a bank or handed out from the cash office, C_{RR}) in the break-even line model. This brings about a need to calculate accrued wages (C_R) and then actual payroll expenses.

Total costs of the enterprise on compensation of employees (C_{RS}) are the product of the value of accrued wages (C_R) by the factor that considers the amount of contributions of the enterprise in the employees' compulsory social insurance system. This presentation of payroll expenses significantly simplifies the computational procedures related to financial operation profit determination.

It should be noted that analysis of payroll expenses not divided into wages of core (production) and auxiliary (office and management and support) personnel does not imply the abandonment of study of the payroll spending pattern. However, the break-even line model may not be used to study the

wage pattern at the enterprise. Special methods of labor and wages economic analysis are used to settle these tasks[1].

It should be noted that the indicator “accrued wages”, just like “delivered wages” does not comprise a cash equivalent of other material incentives, such as bonuses, grant of enterprise shares for long service and others. Such material incentives are provided from net profit and are ignored in the break-even line model.

Tax amount represents budgetary liabilities of the enterprise in monetary form. When determining tax expenses, one has to note that the global and domestic practice uses elements of the price (proceeds) pattern of products sold as a tax base, which include: proceeds, payroll expenses, property cost and profit. Depending on an economic activity, fees for the use of natural resources may be added, including environmental damage fee. However, it is possible to tie all these payments to the above elements of the price (proceeds) pattern.

The tax amount paid by the enterprise may be used to assess tax proceeds from entrepreneurial activity, including broken down by national budgetary system levels (national, regional and local budgets). In this case, payments of the enterprise are distributed over tax proceeds of corresponding budgets in accordance with applicable tax laws.

In most cases, property tax may be ignored when calculating the tax amount in order to build the break-even line model. This assumption is based on the fact that the actual value of property tax is minor compared to other types of taxes and on other reasons set out above. Thus, the tax amount may be presented as three items, where the amount of tax liabilities of the enterprise net of contributions to the compulsory social insurance system is:

- value added tax: where the amount of income tax payable is, is the applicable tax rate established by national laws, C_V is proceeds of the enterprise, C_Z is expenses on third-party services;

[1] Lafta J. K. Organization Theory. study guide. Moscow: TK Velbi, Prospekt Publishing House. 416 p. 2006.

- personal income tax: where the amount of tax payable is, is the applicable tax rate established by national laws, C_R is the amount of accrued wages if an employee is obliged to pay personal income tax in the amount of 100, tax rate is equal to zero (= 0), apparently, tax liabilities are also set to zero (= 0) in this case;

- profit tax: where the amount of tax payable is, is the applicable tax rate established by national laws, C_D is the amount of taxable profit.

The break-even line model proposed comprises indicators of accrued wages (C_R) and taxable profit (C_D). Values of these indicators comprise, correspondingly, personal income tax and profit tax. Thus, the tax amount in the model under study is often represented by one tax only – value added tax (VAT). To obtain the actual value of tax collections, one has to calculate personal income tax (for salaried employees) and profit tax and add VAT. This peculiarity of the model somehow complicates the process of obtaining the actual value of tax collections, but simplifies representation of the model.

Profit of the enterprise (C_D) is referred to as financial operation profit; it is calculated as a difference between proceeds and expenses (cash inflows and outflows). Profit margin is a computed result and, unlike expenses on third-party services and payroll expenses, it may not be directly revised by managers of the enterprise. In other words, profit margin shows the overall performance of the enterprise and reflects, on the one hand, sales, and, on the other hand – economic effectiveness of expenses (on third-party services and payroll expenses in the context of applicable tax laws).

Profit margin is an objective function for the break-even line model. The purpose of practical application of the model is to choose such managerial decisions that will secure the profit above or equal to zero. Zero profit margin is a bifurcation point that delimitates loss-making and profitable activities of the enterprise.

It should be noted that it is most feasible to use the taxable profit margin in the break-even line model. In other words, to obtain the taxable profit margin, not only expenses on third-party services and payroll expenses have to be deducted from proceeds, but also accrued depreciation as well as expenses and inventories that reduce the tax base value established by national tax laws.

Note that calculating taxable profit margin is quite a time consuming task that also requires high qualification. However, it is exactly when calculating the value of taxable profit that one is able to consider all the peculiarities of entrepreneurial activity in the context of applicable national tax and civil laws.

Analytical expression of the break-even line model.

The pattern of proceeds of the enterprise may be presented as an algebraic equation (analytical expression of the break-even line model): where C_V is proceeds of the enterprise over the time period under study (for example, week, month, quarter, year) expressed in absolute (rubles) or relative terms, for example, 100% or 1;

- C_Z is expenses of the enterprise accounted for when calculating taxable profit (all expenses on third-party services are assumed to be liable for value added tax – VAT) expressed in absolute (rubles) or relative terms (for example, as a percentage – %, share of proceeds);

- C_{RS} is expenses of the enterprise on salaried employees' payroll expressed in absolute (rubles) or relative terms (for example, as a percentage – %, share of proceeds);

- is the amount of expenses on all types of taxes and dues expressed in absolute (rubles) or relative terms (for example, as a percentage – %, share of proceeds);

- C_D is pre-tax profit (taxable profit) received by the enterprise expressed in absolute (rubles) or relative terms (for example, as a percentage – %, share of proceeds).

Algebraic expression 3 is referred to as the break-even line model. This name is due to the fact that the reduced function plot is a straight line. One has to determine what all model variables depend on:

1. Sales proceeds C_V – depends on a host of factors, the main of which are: competitive power of goods or services, buying capacity of a target consumer group. Considering these factors, it is obvious that the management of the enterprise is unable to directly affect the main market factors (competitive power and buying capacity of the target consumer group). Competitive power is ensured by the enterprise based on comparison characteristics of similar goods and market share. This means that an entrepreneur is able to exercise only indirect influence on the competitive power level based on capabilities of competing enterprises.

Neither is an entrepreneur able to directly affect buying capacity. It is only pay increase at the enterprise that may enhance employees' buying capacity. Thus, sales and, correspondingly, proceeds of the enterprise depend on the market situation. It is virtually impossible to assess or predict the entrepreneur's direct influence on sales and sales proceeds (other than enterprises-monopolists).

2. Expenses on third-party services (C_Z) may be regulated by the entrepreneur or managers of the company to certain extent only. It is quite difficult to manufacture goods and use much less cash assets on raw materials, supplies and semi-finished goods required for production. However, the influence of the company's management may secure saving in material resources consumption subject to the introduction of new energy-saving technology and reduction of non-productive losses. Processing equipment operation rate (operation in 1, 2 and 3 shifts) and stock of raw materials, supplies and semi-finished goods manufactured at the enterprise is what also matters.

3. Payroll expenses (C_{RS}) are among the indicators that fully depend on the entrepreneur's decision within certain limits. The lower limit (minimum) is the minimum monthly wage (MMW) set by

national laws. The upper limit (maximum) is set by the entrepreneur based on the need to earn the above-zero profit.

4. The tax amount is determined according to the rules set by applicable national tax laws. The entrepreneur may not directly affect the rules of calculating taxes and dues liabilities.

5. Profit (C_D) is the result of calculating the balance of sales proceeds (cash inflows) and expenses on third-party services (C_Z), payroll expenses (C_{RS}) and taxes. The entrepreneur may affect the profit value by regulating expenses on third-party services and payroll expenses as part of applicable national laws.

Analysis of variables of the break-even line model provided (equation 3) allows to conclude that successful entrepreneurial activity depends on sales and effectiveness of management of expenses on third-party services and payroll expenses. If one confines oneself to cost management, the entrepreneur (or manager of the enterprise) only has two actual controls: payroll expenses and expenses on third-party services (production expenses). In this regard, a need arises to establish a dependence between these types of expenses (production and payroll expenses).

In order to establish correlation between production and payroll expenses, one has to somewhat simplify the break-even line model by reducing the number of variables. Since the model under study ignores corporate property tax and since taxes on income of salaried employees and profit are accounted for as part of payroll expenses and taxable profit, the only directly reflected tax is value added tax (VAT). If we establish quantitative taxation conditions with regard to a particular national taxation system, for example:

- VAT – = 20%;
- contribution to the salaried employees' compulsory social insurance system – = 30% of the accrued wages amount;
- profit tax – = 30%.

For these taxation conditions, equation 3 may be rewritten as follows: where (1+0,3) $C_R = C_{RS}$ is salaried employees' payroll expenses of the enterprise subject to contributions to the compulsory social insurance system, with = 30%;

- tax amount for the example at hand is represented by value added tax only.

If we divide both sides of equation 4 by C_V and make elementary algebraic transformations, we may proceed to the valuation of a share of expenses on third-party services, payroll expenses and profit:

Dependence between expenses on third-party services (C_Z) and accrued wages (C_R) may be derived from expression 5. Consideration of the model (equation 5) with zero profit ($C_D = 0$) yields the break-even line. The assumptions provided yield dependence of expenses on third-party services on the amount of accrued wages: $C_Z = f(C_R)$: Numerical coefficients in equation 6 are rounded off. The equation itself is nothing else than an equation of a line; thus, there is a straight-line relationship (equation 6) between production costs (C_Z) and accrued wages (C_R).

This relationship has the following peculiarities:

1. C_Z and C_R values in equation 6 are measured in relative rather than monetary terms. These relative terms show a share of profit in proceeds in the context of applicable taxation conditions provided that the zero profit condition is met ($C_D = 0$).

2. An absolute term in the left side of equation 6 (value 0.83) shows the share of proceeds that may be used after VAT.

3. The numerical coefficient (value 0.83) before variable C_Z allows us to account for the VAT paid when buying third-party services and used for the calculation of actual VAT liabilities of the enterprise (VAT accepted by a tax authority for a refund for the avoidance of double taxation).

4. The numerical coefficient (value 1.3) before variable C_R shows total payroll expenses of the enterprise (subject to payments to the salaried employees' compulsory social insurance system, insurance premiums amount to $0.3C_R$).

5. Personal income tax may be calculated using the "accrued wages" indicator (C_R), in which case tax amount = $0.13C_R$.

6. If the right side of equation 6 is bigger than the left side ($0.85 < 0.85C_Z + 1.3C_R$), one can say that the enterprise is loss-making. If the conditions in equation 6 are met, then $C_D = 0$. If the right side of equation 6 is smaller than the left side ($0.83 > 0.83C_Z + 1.3C_R$), one can say that the enterprise receives the profit equal to a difference between the left and right sides of equation 6: $C_D = 0.83 – 0.83C_Z – 1.3C_R$.

Graphic presentation of the break-even line model.

The chart of the break-even line model $0.83 = 0.83C_Z + 1.3C_R$ (equation 6) is shown. Points of break-even line intersection ($C_D = 0$) with axes are, correspondingly equal to: Y-axis **A** (0, 1), X-axis **B** (0.638, 0).

Reliability valuation of the description of actual entrepreneurial activities using the break-even line model yields the following conclusions:

1. The point of break-even line intersection with Y-axis describes the condition of the enterprise when no added value is created. In other words, the selling price of goods equals their acquisition costs. Of course, this runs counter to the aim of entrepreneurial activity – profit earning.

2. The point of break-even line intersection with X-axis describes the condition of the enterprise when expenses on third-party services are equal to zero. This situation may occur in practical entrepreneurial activities when the services that require no fixed costs, other than payroll expenses (accrued wages, C_R) are provided. These services include consulting, including auditing services, research and development and other similar activities.

3. A straight-line segment bounded by axes (**AB**) contains a set of points, each of which corresponds to the combination of coordinates along the Y-axis and X-axis (C_Z and C_R), with which the identical equation used to describe the break-even line model ($0.83 = 0.83C_Z + 1.3\ C_R$) is valid. In other words, all the points on the break-even line describe the condition of the enterprise when its profit is equal to zero.

4. All the points within the triangle formed by the break-even line ($0.83 = 0.83C_Z + 1.3\ C_R$) and axes describe the conditions of the enterprise when its profit is above zero ($C_D > 0$). This means that the interior part of the triangle forms a certain array of points, the coordinates of which correspond to a share in expenses on third-party services and accrued wages in proceeds of the enterprise, with which the profit margin is above zero. The set of values described represents the area of effective entrepreneurial activity in the national taxation system.

5. If the share of expenses on third-party services and payroll expenses in proceeds of the enterprise is such that the graph has the coordinates (C_Z and C_R), with which the point defined by them is inside the triangle formed by the break-even line and axes, the share of profit in proceeds (profitability of sales) is equivalent to the length of the vertical drawn from that point to the straight break-even line (point to straight line distance). The point to straight line distance may be calculated using analytical geometry equations. During calculations, profitability (share of profit in proceeds) of the enterprise takes on an above-zero value if substituting C_Z and C_R values in the equation yields a positive balance. This positive balance represents profitability of sales – share of profit in proceeds.

6. All the points outside of the triangle formed by the break-even line and axes describe the condition of the enterprise when its profit margin is below zero. In other words, if the values of expenses (C_Z) and accrued wages (C_R) substituted in the break-even line model equation (expression 6) yield a below-zero value, the enterprise is loss-making.

7. Values of shares of expenses on third-party services (C_Z) and accrued wages (C_R) may not exceed one as expenses may not be higher that proceeds. Thus, two asymptotes exist for the break-even line model: correspondingly, parallel to Y-axis $C_R = 1$, and X-axis – $C_Z = 1$.

Discussion.

Most authors specified above mention widely recognized challenges encountered when building economic and mathematical models by the direct costing method. Division of costs into fixed and variable causes the biggest concern. In Russia, for example, this division is commonly referred to as "semi-variable" and "semi-fixed" costs. This name is due to the fact that a change in sales (or output) inevitably brings about the change in absolute values of costs both directly related to goods production and not directly related to production processes. Besides, when the efficiency of the managerial decisions aimed at cost saving is evaluated, there is a need to determine the value of fixed and variable costs. This often brings about questions as to the reliability of results obtained.

The break-even line model proposed eliminates the main drawback – reliability of cost division by the direct costing method. In order to evaluate managerial decision efficiency, it is necessary and sufficient to determine a change in the share of expenses third-party services (C_Z) or a share of payroll expenses (C_R). If at least one of the two values is known, the second one is easily derived in the context of the set taxation system. According to the author, this capability is the main advantage of the proposed cost division method (into two parts: expenses on third-party services and payroll expenses).

Revision of the cost division principle brings about benefits as related to the reliability of initial values and simplicity of obtaining (or setting) quantitative values. At the same time, practical application of the break-even line model narrows the scope of economic analysis as related to study of the results relating to production expansion (including a gain in labor capacity). The break-even

point model with cost division by the direct costing method is, beyond all doubt, the best option for this analysis.

CONCLUSIONS.

The break-even line model presented does not override the traditional direct costing method. This work only supplements well-known and proven methods of management accounting and analysis. Besides, the inclusion of national taxation system conditions into the break-even line model offers new opportunities in the valuation of entrepreneurial activity appeal in various taxation systems.

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