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The promotion of goods within local markets: marketing strategy based on system dynamic methods

Abstract: Article contains results of researches of the market of consumer goods taking into account dynamics of change of the major factors defining its development. The useful information received as a result of model researches, allowed to reveal the most significant factors defining the main market tendencies and to formulate recommendations for development of strategy of capture of the market. The quantitative values of indicators of investment appeal presented in article are criterion of a choice of the correct decision.

Keywords: System dynamics, market of consumer goods, marketing strategy, investment appeal.

Strategic planning is based on the approaches that determine the contents of the strategy. Approaches are often chosen in accordance with the target goals. Unfortunately in practical work decision-makers who experience lack of comprehension and skills select their own tools. It is quite common for modern Russian businessmen to go with their gut. It doesn't mean that analytical methods are not suitable in this situation; the fact is that decision-makers don't know how to use these methods [7].

The objective of our research is to increase the effectiveness of strategic planning process by means of the usage of the approach which is based on pace of developments.

The goals of the research are to analyze current approaches of the market strategy development of an enterprise, to justify dynamic approach for choosing the strategy, to work out a dynamic model of oligopoly market for consumer goods, to test a new method using the example of one of the regional markets of domestic gas meters, to study the relevance of market factors (market drivers) for an enterprise, to determine the management decision packages for achievement of strategic target goals.

First, we are going to describe the principles and approaches that exist in strategic planning. These approaches may coincide for the strategies of such levels as: corporative, functional and business strategies, but methods or algorithms of market strategy development are different. It is considered that representatives of Harvard Business School — K. Andrews, M. Porter, G. Hamel, K. Prahalad are the founders of the approaches for strategy development [1–3]. Approaches offered by these scientists were widely used in 1970s-1990s. It is a popular misconception that traditional approaches are hard and fast guidelines of strategic planning [4–6]. In figure 1 you can see the classification of approaches for strategic planning on the grounds of environment dynamics. To take into account dynamics means conducting analysis of previous accumulated data and designing strategies of business development on the basis of this information. It also means comprehension of the interaction of all significant factors and feedback that can have an impact on the future events. The usage of the dynamic approach has its reason because using different approaches you

may get discrepant results. For example, classical model of M. Porter of five factors that determine competition behavior of an enterprise as a market player may give different market insights compared to the dynamic approaches because impact of one factor over time can significantly change the behavior of the market participants. System dynamics enables to take into account the reaction of each market player, consider complex factors and feedback; adjust the strategy in accordance with expected changes.

The group of classical methods based on time-independent interpretation of course of events includes an approach developed by K. Andrews that centered on the comparison of factors of internal and external environment. This principle was used in SWOT analysis [7–9]. The approach of G. Hamel and K. Prahalad is focused on production specialization of the business. Core competencies offered by these scientists draw management attention to the creation of unique benefits in technologies that give an opportunity to achieve a competitive advantage.

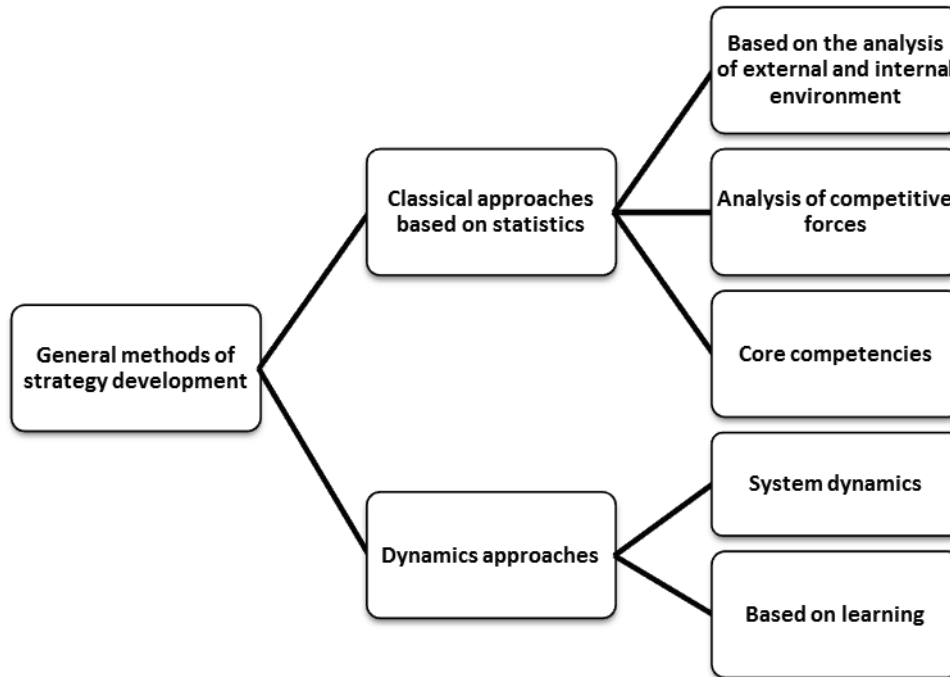


Figure 1. Classification of approaches for strategic planning

The practical application of these approaches is the matrix method which is still being used by analysts because of its simplicity. The algorithm of these methods is simple: based on the present day information and immediate forecasts it is possible to find ways of achieving goals and reduce the gap between planned indicators and current values. An essential fault in these methods is that they don't take into account the dynamics of the external environment, parameters which can hardly be described and the existence of the feedback.

The second group of approaches that is shown in Figure 1 enables to remove listed above shortcomings. These approaches are used in all methods of system dynamics. System dynamics which was first mentioned in writings of D. Forrester gives us an opportunity to choose the strategy of business development on the basis of anticipated feedback process taking place in the system [10]. The dynamic approach finds an application in strategic planning. The author interconnects the definition of the dynamic strategy with an industry and business lifecycle.

He considers that the main idea of his conception is the search of points of impact on the system in order to improve management quality. The dynamic approach should include the system dynamics, the discrete-event simulation, and the agent-based model. It is necessary to take into account events that happened in the past, i. e. the history of earlier periods. We need a conception that comprises an analysis of the situation in the past and the system dynamics as a projection into the future. This approach can be called cognitive as it is based on processing and interpretation of the accumulated information about an enterprise and external environment [4]. It is the dynamic approach that attracts attention because of objective reasons. That's why our research is devoted to the study of dynamic approach usage for market strategy development.

System dynamics along with the discrete-event simulation and an agent-based model is an effective tool of the simulation modeling. Conceptual framework and model building algorithms have been fully described [10, 13].

According to the theory and the basic concepts of the system dynamics a new market model has been developed. It takes into consideration changes of external environment factors, behavior of the key market players, customer feedback, a product lifecycle, economic aspects of marketing which include the determination of the net present value of each market player and investment potential of sales promotion. Hereafter there are successive stages of model building of consumer market using the example of domestic gas meters market. As a software simulation tool we have used Anylogic 6.9.0 Advanced. The aim of model building is to identify the behavior of an enterprise under current market situation, i. e. market strategy. At the first stage we created the basic model

of influence of external environment factors on market player behavior. Figure 2 displays the primary model of one of the regional markets of domestic gas meters that later on was supplemented by variables and invariables influencing on market activities.

The model consists of accumulating units (the number of households, potential buyers, and the number of purchases from each market player or the definite vendor), flows, variables (sales and so on) and invariables which are used to determine the variables. The idea of this model as well as any other dynamic system is to identify the optimal law of flow control, in this particular case sales volume under the influence of external factors.

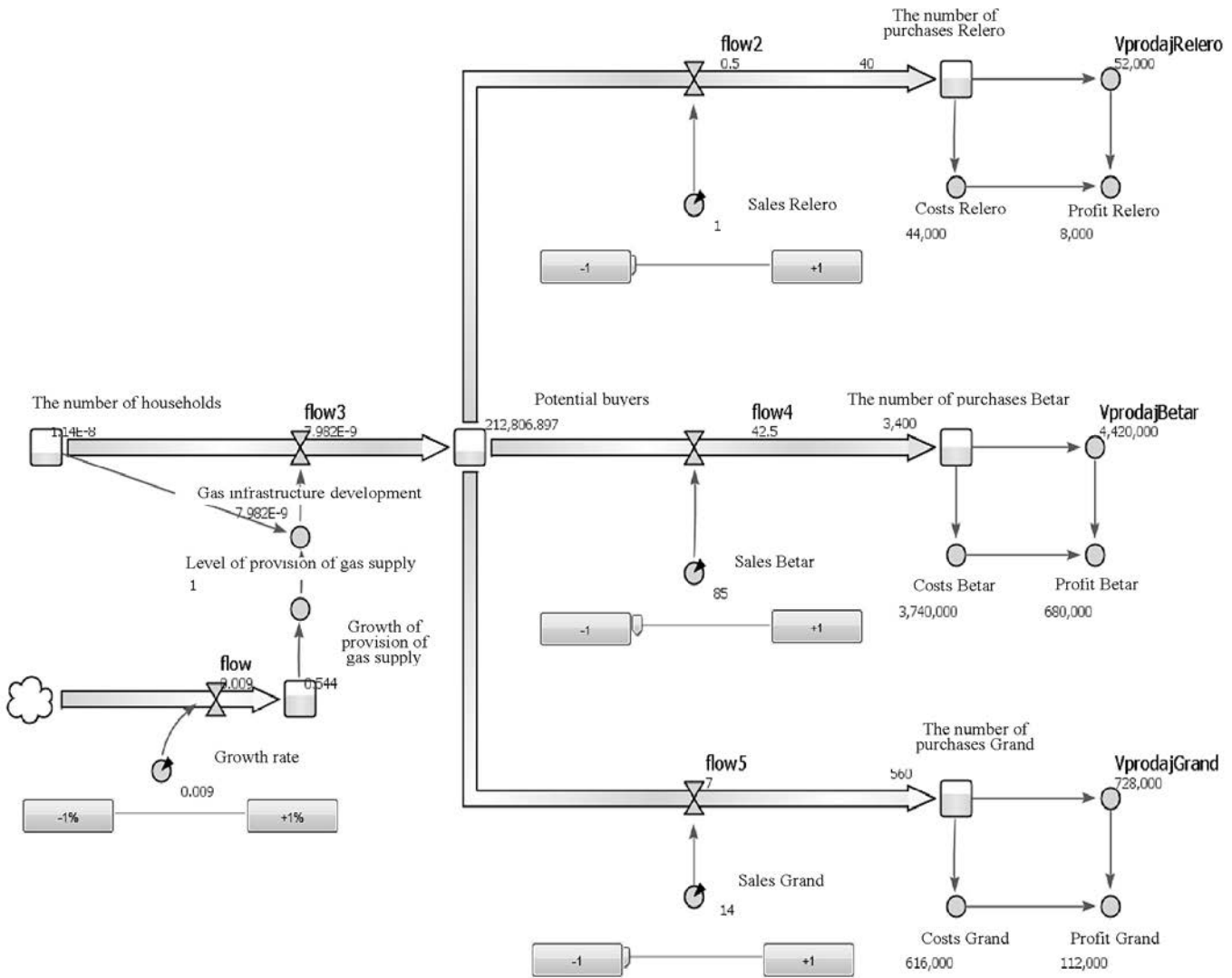


Figure 2. Primary model of the regional market of domestic gas meters

There are three key players in the domestic gas meters market. The market leader is the company “Betar”; second best is the company “Grand” which is strengthening its position. “Relero” rounds out the top three. The peculiarity of the existing situation is that products offered by these companies have the same consumer at-

tributes (similar specifications, price) but they find different demand on the market. The secret of the success is the company ability to sell its product, availability of a well-defined marketing plan and a promotion strategy. Nowadays “Relero” is underperforming but this company was among the first developers of the product. In

order to change the situation for the better “Relero” has come to a decision to enhance marketing activity by means of market expansion. At present a marketing strategy for market share increase is being worked out, the policy in relation to its competitors is being determined. If we want to know what measures it is necessary to take for achievement of the strategic goals (for example to seize 30% of the market) we must identify the most efficient leverages. That’s why we have created the model that enables to specify optimal parameters of the marketing management system under dynamic conditions. The unique feature of the model is the possibility to observe interaction of all factors which have great influence on sales dynamics. The number of potential buyers was determined by a formula:

$$N = \frac{N_0}{c} \cdot a \cdot (1 - b) \cdot \Delta T$$

where N is the number of potential buyers of gas meters;

N_0 — population size of the region

c — ratio considering dependence between population size and the number of households;

b — the rate of households that have already had domestic gas meters

ΔT — the growth rate of provision of gas supply in the region.

The distinguishing feature of the given model is that it takes into account the growth dynamics of the number of potential buyers in connection with the rate of provision of gas supply. The strategy is worked out for a long term perspective because by the end of the planned period there may be substantial changes in market volume. In the model there are some regulators which give an opportunity to adjust changes of variables (for example, rate of provision of gas supply) by means of discrete increment (+1; -1). Sales of each market player are calculated as a product of numbers of units purchased on a unit price. To verify the model we compared actual and model values of sales and market shares. Actual values of market shares were determined by conducting market research. Fig. 3 shows primary distribution of market shares that identifies starting conditions for modeling.

Model values of sales volume

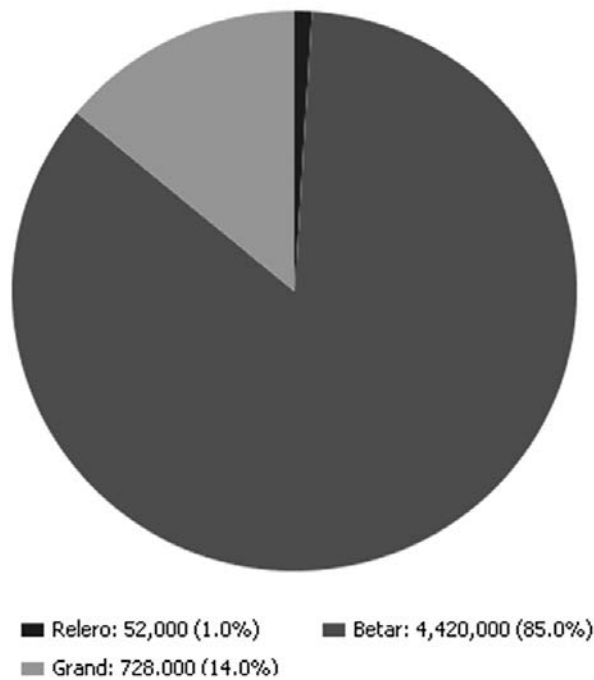


Figure 3. Initial values of market shares

Modeling horizon contains 60 periods; the duration of each period is one month. Three flows characterize sales volume of each vendor and the intensity of sales flows is adjusted in the model on the basis of market share values.

Factors which are involved in market forming: the stage of product lifecycle, power of persuasion (feedback

between people who have already bought the product and potential buyers), influence of commodity price and the most important factor — marketing activity that includes the number of sales outlets having certain turnover, advertising effectiveness have been antecedently identified.

Figure 4 shows the fragment of the model that considers segment lifecycle.

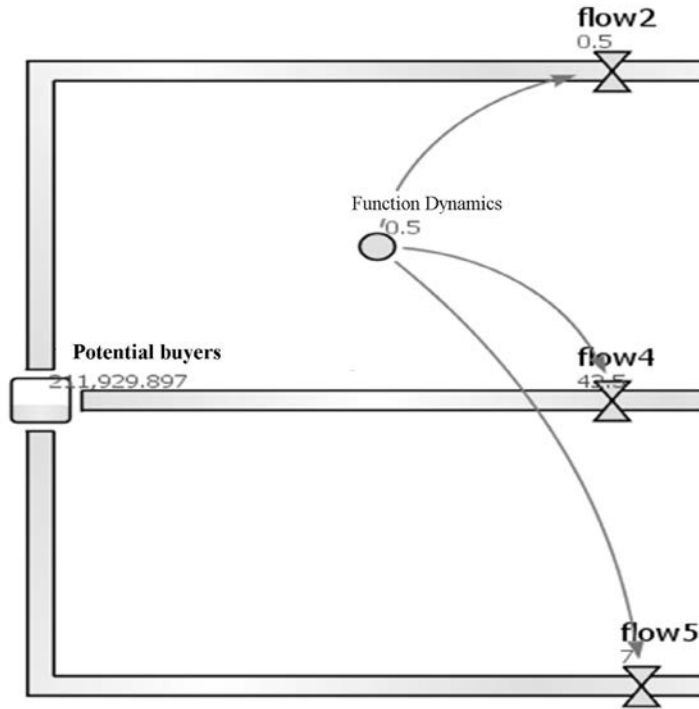


Figure 4. The fragment of the model that considers segment lifecycle

The situation at the federal market of domestic gas meters has an impact on a sales flow. It is known that according to the federal law № 261 by the first of January 2015 all households must have devices for metering gas consumption. This fact allows forecasting high demand in the first six months of 2015 and then there will be a slump in demand caused by market saturation. We have simulated anticipated

demand swings for gas meters caused by current situation in the external environment by using the standard tabulated function of the software program Anylogic. Fig. 5 depicts the graph of total values of sales volume of these vendors for 60 periods. On the graph we can see nonlinearity that resulted from high demand in the peak of segment lifecycle (approximately the first half of 2015).

Sales volume

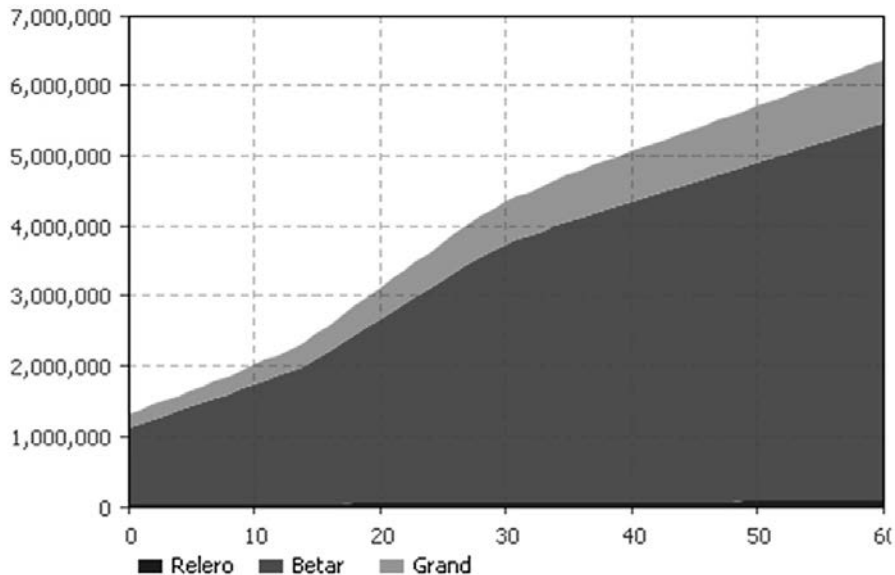


Figure 5. Sales considering segment lifecycle

In Fig. 6 the scheme considering changes in consumer activity is shown. By means of the tabulated function “Function Dynamics” we can control sales flows of each

market player according to the predetermined values. Thus, in the model the factor of external environment dynamics is taken into account.

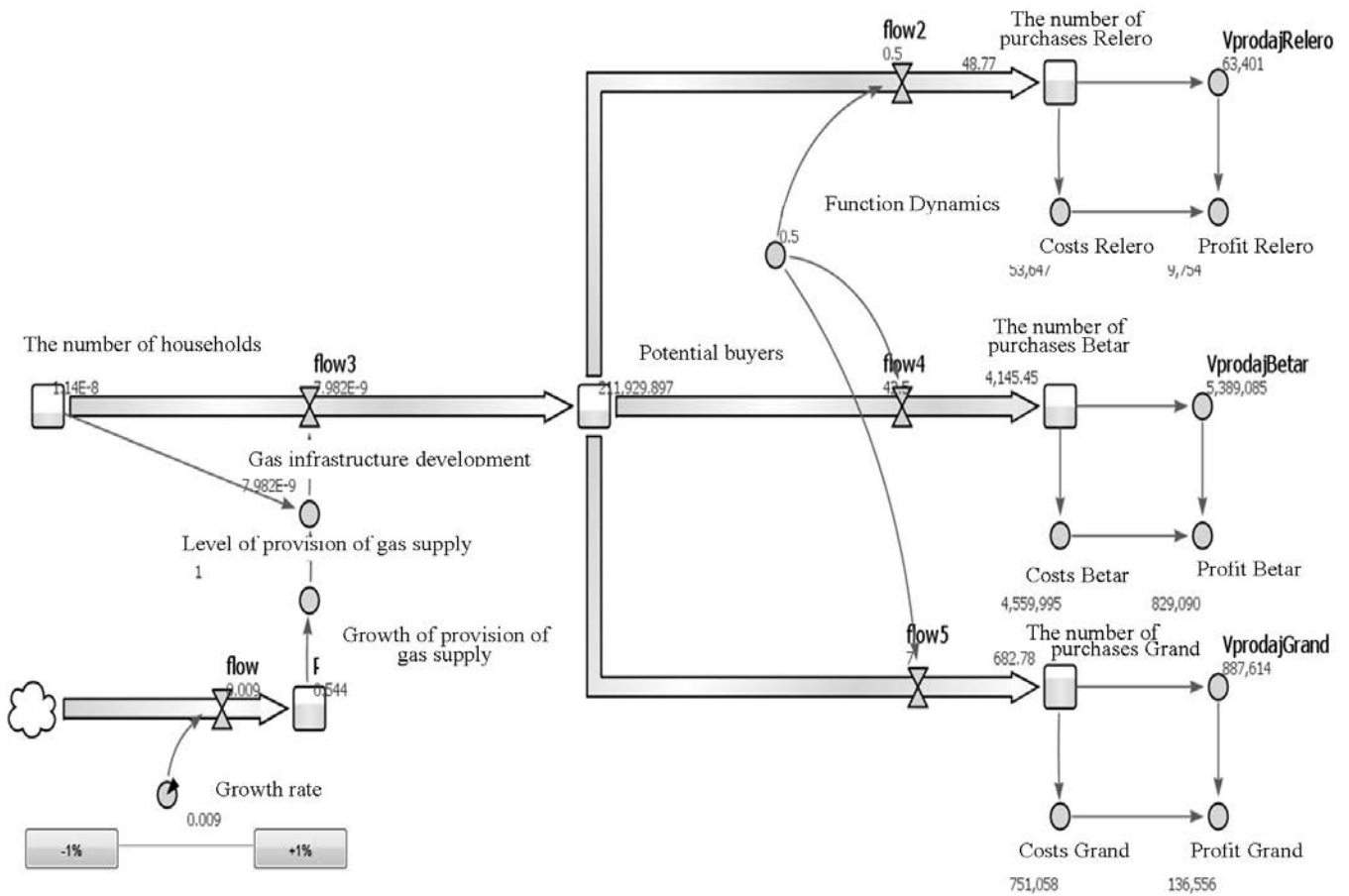


Figure 6. Marketing model considering changes in segment activity

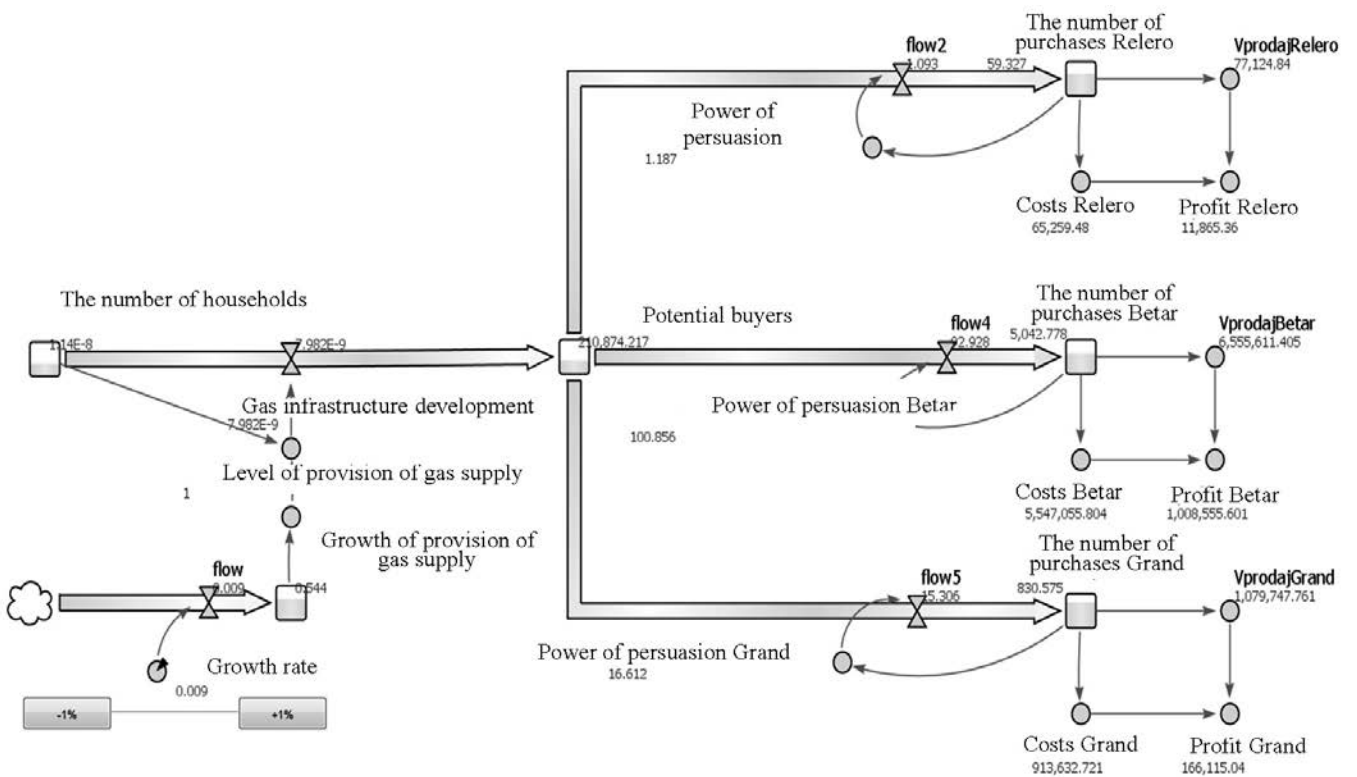


Figure 7. Marketing model considering such factor as persuasion of buyers

At the consumer market there are some laws which speed up or slow down the activities inside the environ-

ment. It should be noted that buyer decision process is motivated by the opinion of other people who have al-

ready bought the product. In the marketing this phenomenon is called word-of-mouth advertising. Customers having bought a product tell potential buyers about their good purchase and thereby influence on sales growth of a vendor. The higher turnover of the company, the more potential buyers the vendor can have. The quantitative influence of this factor is measured by a purchase probability being estimated as 0,015 or 0,02. It means that every 100 people who have bought a product could turn 1 or 2 potential buyers into actual ones. Our further research revealed how important this influence was and whether we should take into consideration this factor. Fig. 7 displays the marketing model considering the factor of word-of-mouth advertising. The variable value "Power of persuasion" shows purchasing intensity of every brand made under the influence of word-of-mouth advertising.

The results of undertaken studies of the model when the power of persuasion equals 0,015 or 0,02 demonstrate the telling impact of this factor (the results are given in fig. 8 and 9). We assume that in other regions this indicator may vary depending on demographic and social factors, that's why we performed computation enabling us to come to a conclusion about the power of the factor. We can see from the graphs that increase of power of persuasion by 3% results in growth of total sales volume by 10%. One may state that this factor becomes more and more apparent when sales of a company are higher. The influence of this factor is visible when we investigate market leaders, underperformed companies don't show any changes. Time element plays an important part — the longer the period of the project, the more people who have bought a product under the influence of buyers' opinions.

Sales volume

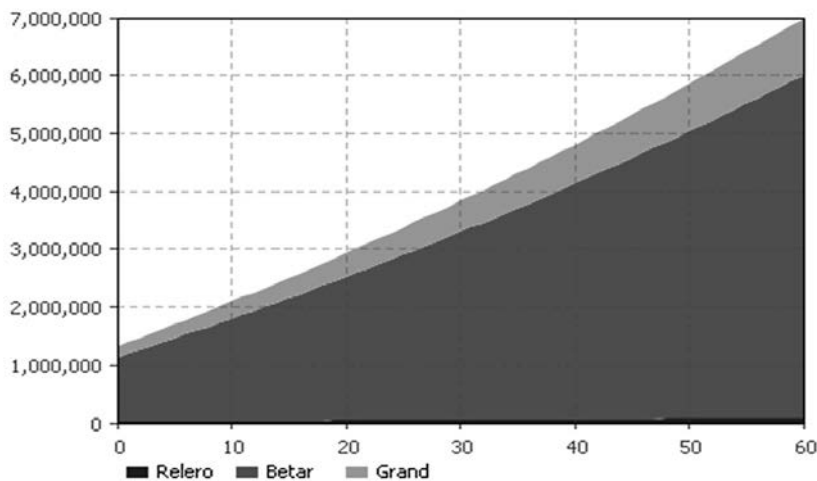


Figure 8. Sales volume when the power of persuasion is «0,015»

Sales volume

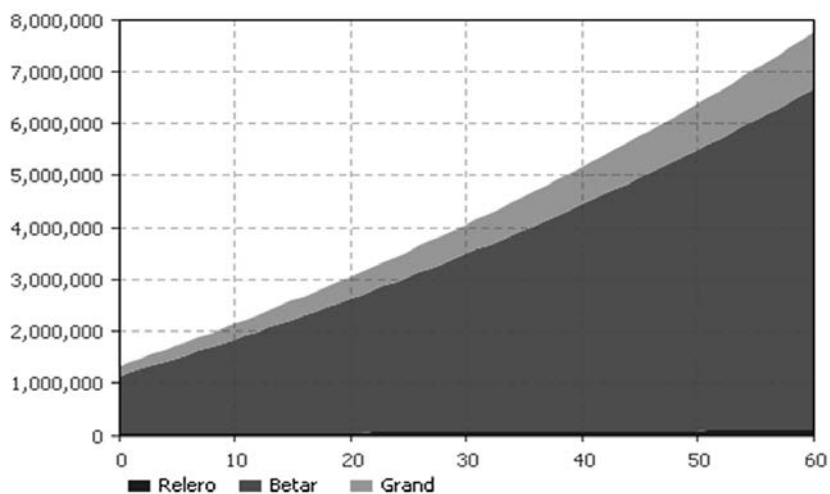


Figure 9. Sales volume when the power of persuasion is «0,02»

The next factor which we investigated was a marketing activity of a company. This integrated indicator displays the effectiveness of the market promotion of a product. It includes a number of actions having specific contents and a predictable result. In this case the principle of measurability is observed and the result has got a quantitative evaluation. There is no use planning any actions if a quantitative result is unknown. This key element defines the validity of the developed models. If there is a lack of comprehension what result we expect (by how much will the sales volume be increased?) it is no use carrying out a project even by means of the system dynamics. We may conclude that we must know

consequences of every stage of the project and its rough estimation. For instance, if we plan a promotional event with a certain budget we must forecast what impact it may have on our business. Business event contents for intensification of the marketing activity include creation and expansion of a sales system (opening of new sales points, monthly turnover for each region can be determined by the primary analysis of the market), promo offers, advertisements, e-tail and other actions which are the most effective according to the precise context and region. The increment of the parameter “Marketing activity” in real situation brings about sales volume increase by a particular value.

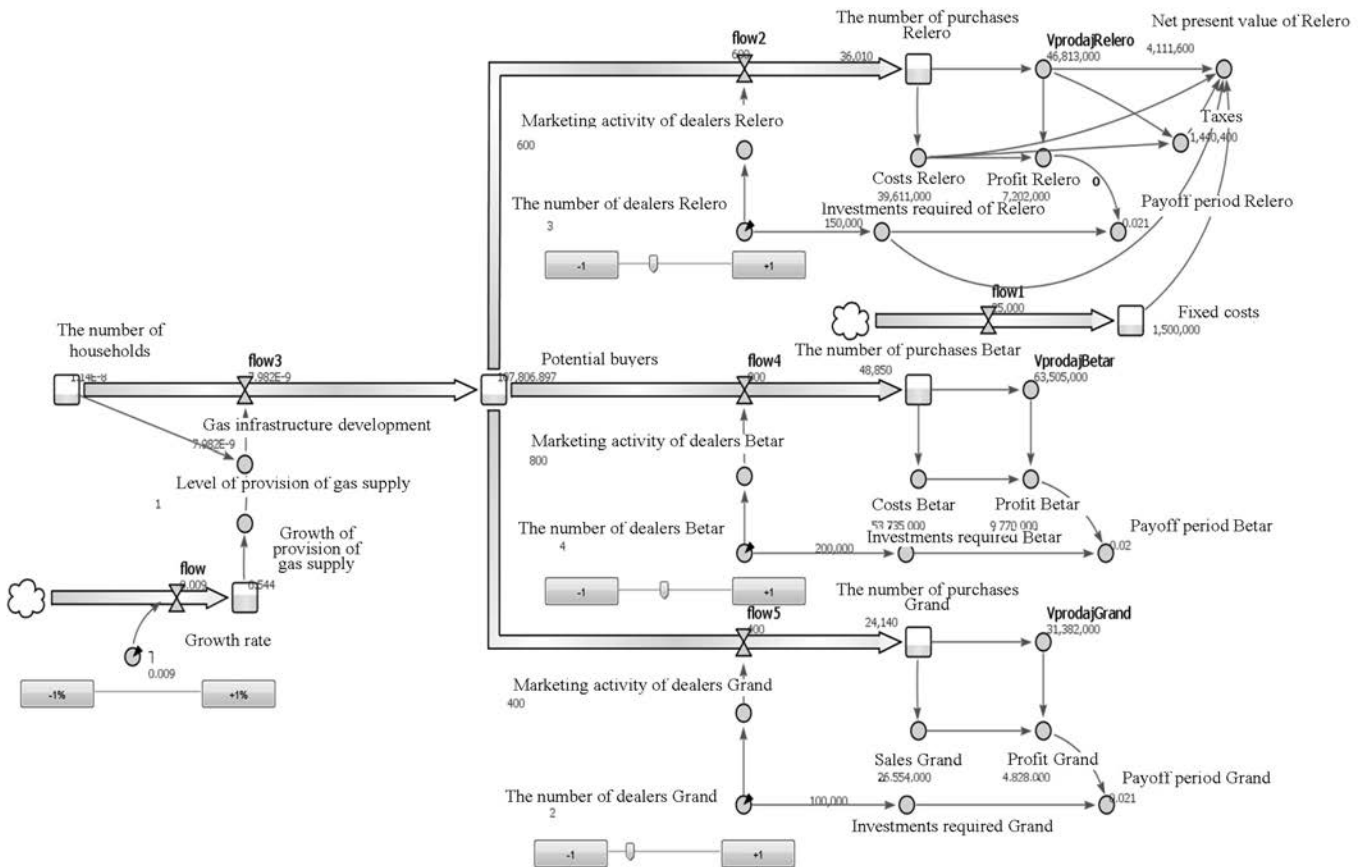


Figure 10. Consideration of the marketing activity in the regional market model

Every stage of the project requires costs, so in the scheme (Figure 10) this parameter is called “Investments required” and such presentation of economic indicators enables us to calculate investment potential of each stage. If we have a strategic goal to seize 30% of the market we can forecast the planned turnover increase by varying the number of new outlets because we know investment required to open new sales points (on the basis of an estimate of planned expenses), maintenance expenses for an outlet (rent, compensation of employees, utility payments). Taking into consideration sales revenue it is possible to calculate a payoff period of investments and

a net present value for the whole period of the project, i. e. we may find out a criterion value that measures the level of region attractiveness.

Figure 11. Net present value for the forecasting period.

These data enable us to make initial conclusions about the situation at the market of domestic gas meters in the region. Thus we can decide what we should do to achieve our strategic goal (how many outlets to open, what advertising campaign to use and etc.), how many investments we need, when they will be repaid and what the net present value output will be. The

last indicator can be used to estimate the effectiveness of any product promotion plan and implementation of the outlined strategy. It can help to work out a

plan how to seize the federal market determining strategically important regions.

Net present value of Relero

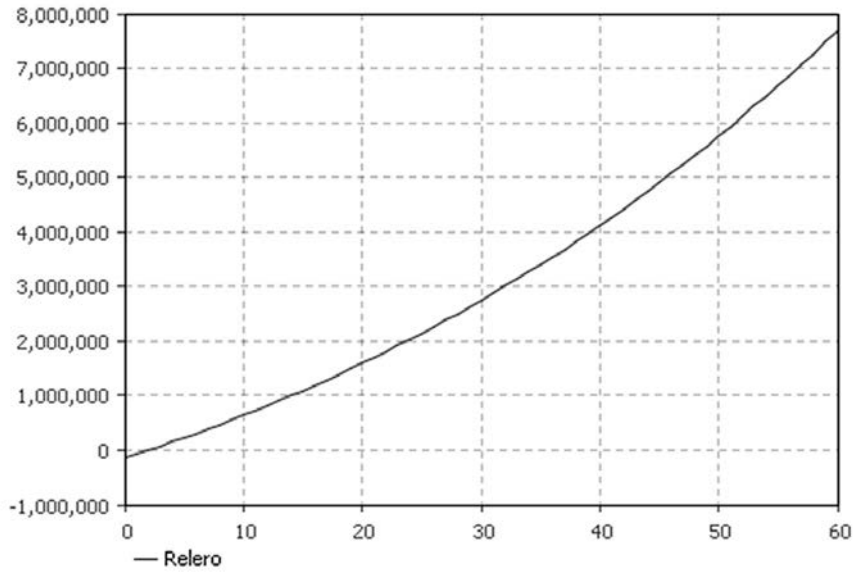


Figure 11. Shows the graph of changes of the net present value in rubles for 60 periods (months)

Fig. 12 displays market shares values that were achieved by varying marketing activity indicator (by increasing the number of newly opened outlets) in order to get 30% of the market. In the process of model execution it becomes clearer how many outlets we have to open for achievement of our strategic goal (in our region we had to open three outlets), when we can seize the market

(whether we can do it before decrease in demand) and how many investments and resources are necessary to execute a product promotion plan under the given initial conditions (the number of households, growth of provision of gas supply, power of persuasion, market behavior). It is worthwhile investigating other regions to aim efforts and resources at the most promising region.

Expected values of sales volume

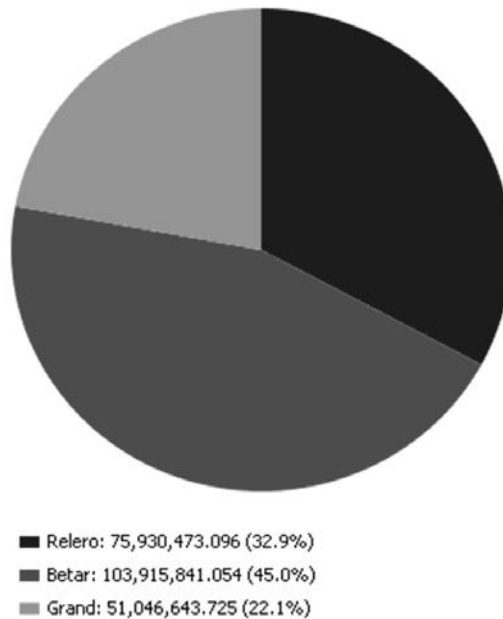


Figure 12. Model calculation of market shares

In the article we haven't touched upon the subject how a product price can influence on a selling rate. To fill a gap we added in the scheme the variable "Price reduction impact" that reflects dependence of sales increase on price reduction. In Fig. 13 the marketing model with the variable "price reduction" is shown. In the model we assume sales increase at the expense of price reduction but now at the market there is a set level of prices that is

equivalent to the lowest value. Simulation results showed that reasonable reduction of wholesale price would lead to a slight increase of sales volume, consequently there is no point in considering this indicator as the main driver of sales of this sample of a gas meter. In the long view an invention of a new type of a device may blow up a market but at the present time we assert that the marketing activity is the most significant regulator of sales growth.

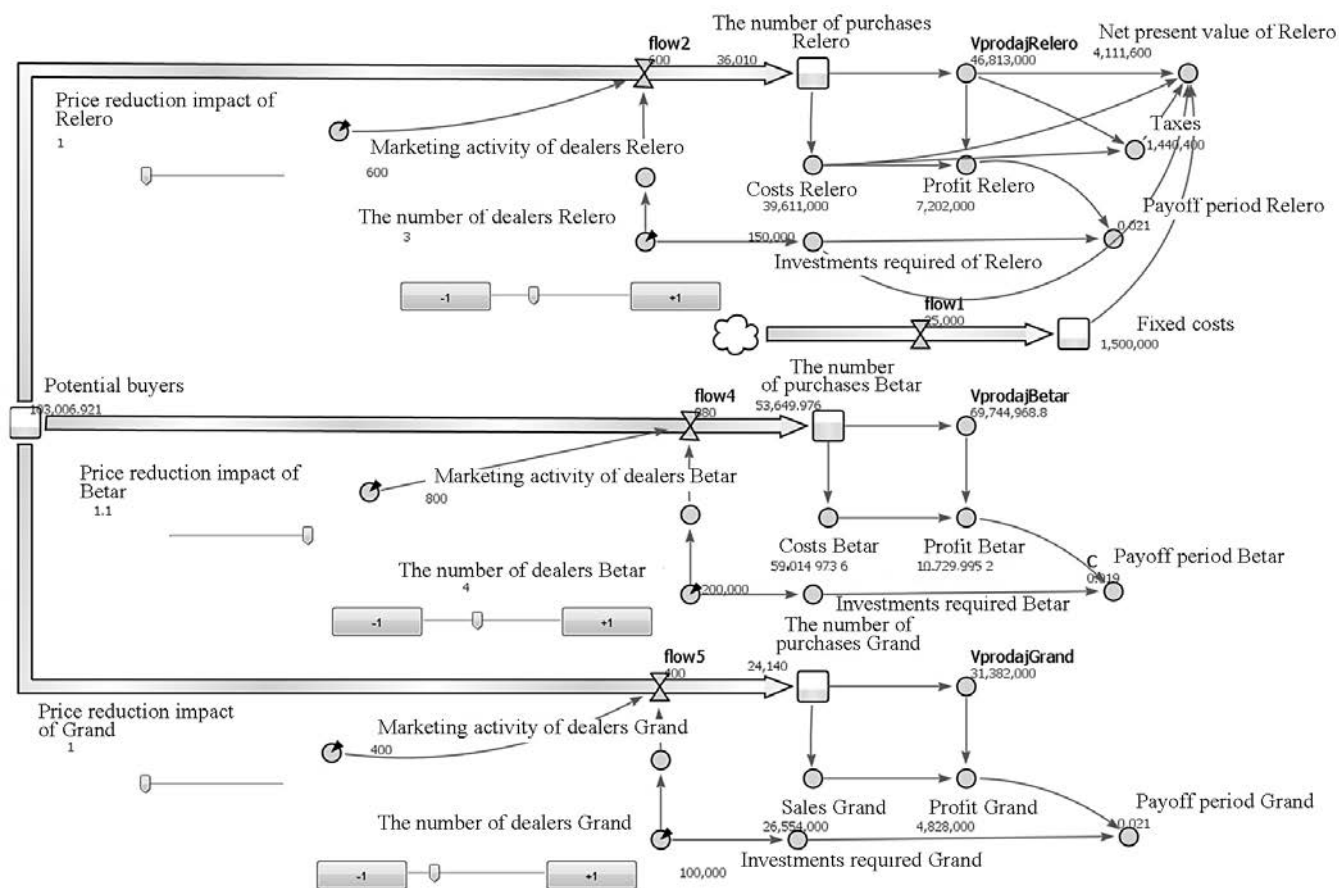


Figure 13. Marketing model considering such factor as price reduction

On the basis of the simulation results and conducted studies we can make the following observations:

1. The dynamic approach is more forward-looking than other marketing strategies because it enables to compute level of all factors and to rank them in accordance with their importance.
2. The dynamic model gives us an opportunity to find in the system the optimal points for managerial decision making, to formulate a marketing strategy in order to achieve strategic goals with minimum expense.
3. Validation of strategy selection enables us to assess our resource requirement, timeliness and sequence of its usage.

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Improving using of the company’s advertising budget

Abstract: The life cycle of a product plays a crucial role along with the advertising campaign when forming the budget of the advertisement. The effective planning of the advertising budget to achieve the competitive advantage and the efficient spending of the advertising budget are widely described in this article. Besides this, the efficient planning of the advertising budget to achieve the effective advertising is also described here.

Keywords: Advertising market, advertising budgets, advertising effectiveness, advertising costs.

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