Problems of Management of Enterprise Development in the Sphere of Building Materials Production

[1]Lapina Lidija and [2]Guzikova Liudmila

[1]Department of Economic Theories, St. Petersburg State University of Architecture and
Civil Engineering, Vtoraja Krasnoarmejskaja ul. 4, St. Petersburg, 190005, Russia
[2]Department of Finance and Currency Circulation, Institute of Construction Engineering,
St. Petersburg State Polytechnical University,
Polytechnicheskaja ul. 29, St. Petersburg, 195251, Russia

Abstract: The paper gives a brief overview of the factors that determine the conditions for the development of the building materials industry enterprises. Growth management requires careful balancing of the objectives of companies in terms of sales and the effectiveness of its operation and financial resources of the model. The issue is to determine what level of sales growth is consistent with the actual situation of enterprises and financial markets. The most important objectives of most companies include maximizing profits and ensuring the long-term existence. However, the issue of maximizing profits in the short term can lead to a reduction of liquidity in the long term, while the desire to improve the liquidity may lead to lower profitability and, thus, efficiency. Therefore, when modeling the sustainable growth of companies, you must strive to: a) maintain a sustainable balance between liquidity and efficiency, if it was reached and b) approach it, if there is no such balance. In the first case, enterprises face the challenge of stable growth, in the second - the sustainable growth. Thus, modeling the sustainable growth rate (SGR) enables to identify the companies' response to the effect of individual factors and to develop measures to offset the risks associated with the effect of these factors on the achievement of the planned growth. Further, the author justifies the use of the sustainable growth model for managing the development of enterprises. The tasks that can be solved on the basis of this model are analyzed as well.

Key words: Building materials industry · Management of enterprise development · Model of sustainable growth

INTRODUCTION

In any country, the building materials industry is the basic industry of the construction complex, the products of which will largely determine the basic characteristics and results of its operations-the deadlines and the volume of construction work, the quality of constructed buildings and structures [1]. The problems and techniques of industrial enterprises of building materials, in particular, in Russia are the subject of scientific research, in which the following microeconomic aspects can be outlined:

- Finding ways to ensure stable development of enterprises [2-5];
- Using methods of financial and economic management at enterprises [6, 7];
- Identifying risk factors in the operation of enterprises and the development of methods and techniques of risk management [8-10].

The purpose of this paper is to propose and justify the management model of the development of the building materials industry enterprises in Russia, which would allow solving a complex of

Corresponding Author: Lapina Lidija, Department of Economic Theories, St. Petersburg State University of Architecture and Civil
Engineering, Vtoraja Krasnoarmejskaja ul. 4, St. Petersburg, 190005, Russia
Tel: +7(921)9497434.

problems, determined by the features of the modern state and the conditions of operation of enterprises.

MATERIALS AND METHODS

The problem was solved on the basis of the following:

- The study of the provisions of economic theory and financial management related to the development management and growth of industrial enterprises;
- Identification and analysis of the models designed to manage the development of enterprises under market conditions;
- Identification and compilation of actual requirements for the development of Russian building materials industry enterprises.

The Main Part: At the present time, the conditions of activity of the building materials industry enterprises in Russia are determined by the following key factors:

- Local nature of markets, due to the binding of the majority of enterprises to sources of raw materials and inconvenience of transporting goods over long distances [9];
- Significant fluctuations in sales volumes due to the construction cycle, seasonality, financial and economic crises [10];
- Low growth rate of volume of output [11];
- Active integration processes within the construction industry [12];
- Low efficiency of enterprises [13];
- Need for investment resources with limited access to debt financing [7].

These factors dictate the management problems that the building materials industry enterprises are facing:

- Increasing sales;
- Reducing the risk of loss of independence of the enterprise,
- Creating the growth basis of the enterprise assets from its own resources while ensuring the interests of the founders in revenue,
- Increasing business activity and performance.

This set of objectives should be resolved on the basis of decision-making model that would allow to coordinate the strategic guidelines of the enterprise with using opportunities provided by the market and the available potential, as well as the requirements to the level of risk [11-13].

Growth management of an enterprise requires balancing of its objectives in terms of sales and effectiveness of its operations, as well as the use of financial resources. An enterprise shall determine a level of growth that is consistent with its real position-internal conditions and environment conditions [14]. In an effort to maintain market positions and stable development, under conditions of unsaturated market and with products modification possibility, an enterprise, as a rule, chooses the strategy of sustainable growth. Modeling the level of sustainable growth allows determining the maximum allowable annual sales based on specific indicators of intensity of using assets (asset turnover), debt level (financial leverage level) and reinvested earnings ratio [15, 16].

Exceeding the rated value of sales growth is potentially possible, but it can be achieved only at the expense of deteriorating one or more of the above indicators. For example, higher sales growth can be achieved through the expansion of trade crediting and liberalization of trade credit conditions, which leads to an increase in accounts receivable and slows down the turnover of assets. This increases the risk of non-payment and late payments, which would destabilize the enterprise turnover and disrupt the production rhythm. The increase in leverage in the structure of funding sources increases the risk of loss of control over the enterprise, as it is associated not only with an increase in debt servicing costs, but also with the need to comply with more stringent payment discipline. A decline in the plowback ration may lead in future to the loss of competitiveness of an enterprise and in the near-term can result in a reduction in market share [17].

In the model of the sustainable growth, the financial and economic characteristics of the major subsystems of the economic mechanism of an enterprise are consistent (Fig. 1). The resource subsystem is presented in the framework of the debt funds corresponding to a financial resource and a plowback ratio, reflecting a process of increasing financial resources. The production subsystem is characterized by assets, considered a
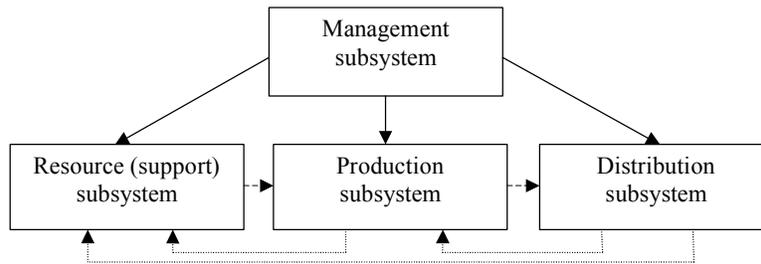
Fig. 1: Interaction of subsystems of the enterprise economic mechanism
(solid lines show the directions of the immediate control actions, dashed lines show the directions of direct control actions and the dotted lines show the directions of indirect control actions)

revenue generator and the distribution subsystem is characterized by the volume of sales and the share of profits in this volume, that is an indicator of sales efficiency [18].

In the basic case, the sustainable growth model is based on the assumption that for the next planning period the above-described characteristics of the financial and economic mechanism should retain their current values. It is assumed that the enterprise is increasing the amount of the used equity capital only at the expense of the retained earnings, but does not increase the authorized capital at the expense of the founders (depending on the legal form of business, these may be the additional contributions of founders or additional issue of shares). In a stable environment, the sustainable growth level, which is the relative change in the volume of sales, is described by the following formula:

$$SGR = \Delta S / S = \frac{b*(P/S)*(1+D/E)}{A/S - (b*(P/S*(1+D/E)))}, \quad (1)$$

where A-company's assets in the base period,

- E-equity capital in the base period,
- D-debt funds in the base period,
- S-sales of the base period,
- P-profit of the base period,
- b-plowback ratio, showing how much of the profit remains in disposal of the enterprise,
- ΔS-sales growth in the plan period [16].

Note that according to the principle of balance for the base period equity A=E+D must be observed. It is assumed that during the planning period the asset growth is achieved by reinvesting the profits of the base period and a proportional expansion of debt funds. This assumption is quite realistic, because the increase in sales is usually accompanied by an increase in accounts receivable and an increase in equity capital can increase the amount of debt financing without compromising the financial independence of the enterprise. Thus, the increase in the assets in the plan period can be expressed as the sum of growth through retained earnings and an increase in debt funds [19].

In the model of sustainable growth it is not the absolute values of the variables in the base period that are significant, but the following indicators:

A/S = the value inverse to the asset turnover ratio, which characterizes the economic activity of the enterprise. The lower is the ratio, the more efficiently the enterprise uses its assets. This indicator reflects the quality of the accounts receivable management, that is, the relations with customers, management of raw materials and finished products inventory, enterprise asset management, reflecting its production capacity, liquidity management, that is, cash and financial investments that reflect the solvency of the enterprise;

P/S-profitability of sales-an indicator of the efficiency of the enterprise. The value of this figure is significantly affected by market conditions and the competitive environment;

D/E-financial leverage-an indicator of financial independence (financial stability) of the enterprise.

Together with the plowback ratio *b* the three of the above ratios are the main parameters of the sustainable growth model.

Calculated by the formula (1) the sustainable growth is the maximum increase in sales, corresponding to planned values of the ratios. Actual sustainability of such growth depends on market conditions and the enterprise's own marketing efforts. The formula reflects the sustainability of the growth in terms of funding, but for the realization of growth it is necessary to examine the demand and the possibility of additional sales of products.

Table 1: Dependence of sustainable growth on the model parameters

| Parameter	Calculation increment									
	1	2	3	4	5	6	7	8	9	10
A/S	0.500	0.530	0.561	0.594	0.629	0.666	0.705	0.747	0.791	0.838
P/S	0.200	0.180	0.162	0.146	0.131	0.118	0.106	0.096	0.086	0.077
D/E	0.250	0.225	0.203	0.182	0.164	0.148	0.133	0.120	0.108	0.097
b	0.500	0.450	0.405	0.365	0.328	0.295	0.266	0.239	0.215	0.194
SGR(A/S)	0.333	0.309	0.287	0.267	0.248	0.231	0.215	0.201	0.188	0.175
SGR (P/S)	0.333	0.290	0.254	0.223	0.196	0.173	0.153	0.136	0.121	0.107
SGR(D/E)	0.333	0.325	0.317	0.310	0.303	0.298	0.293	0.289	0.285	0.281
SGR(b)	0.333	0.290	0.254	0.223	0.196	0.173	0.153	0.136	0.121	0.107
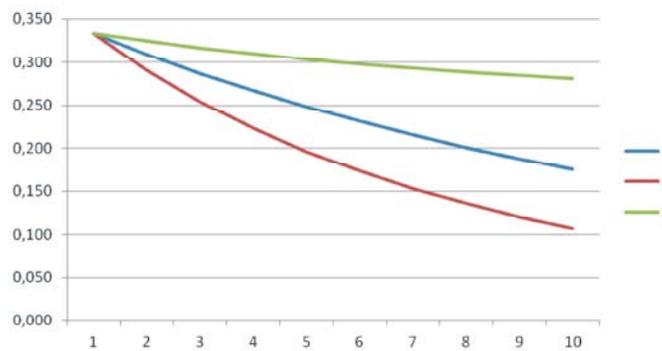
Fig. 2: Dependence of level of sustainable growth on the model parameters
1-Increase of A/S, 2-Decrease of P/S or b, 3-Decrease of D/E,

Table 1 shows the dependence of the sustainable growth level on the model parameters. The initial values and the order of the changes are as follows:

A/S = 0.5, which corresponds to two turns of assets during the year. Deterioration (increase) in the ratio with increments of 5% is modeled;

P/S = 20%, deterioration (decrease) of the parameter of 10% of the previous value is modeled;

D/E =0.25, which corresponds to 25 per cent share of the debt funds, decrease with increments in the proportion of 10% is modeled;

b=0.5, reducing the share of reinvested earnings with increments of 10% is modeled.

The results of modeling are intuitively shown in Fig. 2. For practical use of the sustainable growth model we must take into account that the planned parameters need not be set at the level of the base period and the increase in sales volume and growth of equity capital does not necessarily have to be balanced in any time period. In addition, the reinvestment policy often suggests not a fixed value of the plowback ratio but payment of cash income to the founders of the enterprise in the form of a fixed amount and the reinvestment funds are defined as a residual [19, p. 107-139]. With these assumptions, the sustainable growth level can be calculated by the following formula:

$$SGR = \Delta S / S = \frac{(E_0 + E_{new} - D_1)*(1-D/E)*S/A*1/S_0}{1-P/S*(1-D/E)*S/A} - 1 \qquad (2)$$

where, E_{new} is the adjustment to equity capital due to causes other than the reinvestment of profits.

Note that in contrast to formula (1), formula (2) has indicators presented in monetary terms: the amount of equity capital in the base period, the change of equity capital, the amount of dividends planned for the payment and sales of the base period. Note also that formula (2) uses asset turnover ratio in its standard representation as a sales ratio to total assets. Planned values of the ratios can be set with the desired changes in the functioning of the financial and economic mechanism of the enterprise [20].

The model represented by the formula (2) can be used by building materials industry enterprises for a wide range of problems related to the harmonization of indicators of the functioning and development of the financial and economic management mechanism. These problems, in addition to determining the maximum sales growth, which does not disrupt the balance between the parameters of the financial and economic mechanisms, also include the following:

- Determining the required level of asset turnover for given values of sales growth, profitability of sales, changes in equity capital, the amount of revenue and payment of the debt and equity:

$$S/A = \frac{SGR-1}{(1-D/E)*((SGR-1)*P/S - E_0 - E_{new} + D_1)*1/S}$$

(3)

The tools that allow controlling the level of turnover of assets, is the sale of property not involved in the production process, optimizing inventory management, review of credit sales policy.

- Determination of the required ratio of debt to equity funds at specified values of asset turnover, sales growth, profitability of sales, changes in equity and the amount of income payment:

$$D/E = \frac{SGR-1}{S/A*((SGR-1)*P/S - E_0 - E_{new} + D_1)*1/S} - 1$$

(4)

Management of the ratio of debt and equity financing sources in the short term can be very difficult [21]. With these terms, the tools of management are delays and trade credit on the acquisition of raw materials, the search for possible ways to expand equity capital-increase in the membership of the founders, the search for central funding, etc [22-23].

- Determining the required level of profitability of sales for a given level of turnover of assets, sales growth, changes in equity capital, the amount of revenue and the ratio of debt to equity:

$$P/S = \frac{(E_0 + E_{new} - D_1)*1/S}{SGR-1} - \frac{1}{(1-D/E)*S/A}$$

(5)

Managing the level of profitability is directly linked to the policy of pricing and cost management.

- Determination of the required changes in equity capital for a given level of turnover of assets, sales growth, profitability of sales, total income payments and the ratio of debt to equity;
- Determination of potential income payments to the founders for a given increase in the volume of sales, asset turnover, profitability of sales, changes in equity capital and the ratio of debt to equity.

The enterprise associated with the production of building materials very often seeks in the process of planning to achieve the desired values of several parameters at the same time [24]. However, the main feature of a balanced development of the enterprise is the steady growth of equity capital in proportion to sales. Smoothing the discrepancies can be achieved by changing one or more of the ratios [20].

We can verify compliance with various growth plans by inserting the values of parameters in the formula (2). Modeling sustainable growth allows revealing the discrepancy, as well as analyzing the sensitivity of the target enterprise indicators to a variety of factors.

CONCLUSIONS

Modeling the sustainable growth rate (SGR) is the maximum sustainable annual sales growth in percentage, based on the planned cost factors of economic activity, the debt ratio and the amount of dividends to be paid.

- SGR is a flexible integrated tool for coordinating economic and financial parameters of the enterprise. The growth of equity capital will be stable, balanced, if it is proportional to the growth in sales. The companies often want to achieve optimal performance: the elasticity of production, moderate amount of invited loans, high rates of growth in sales and larger dividends. However, these figures may not be consistent with one another. Modeling the level of sustainable growth helps discover the discrepancy.
- SGR allows taking the best decisions to determine the strategy of enterprises. With constant attention of corporations to the asset turnover and asset management, such modeling can play a significant role.
- The use of the sustainable growth model for the adoption of marketing, production and financial decisions for Russian enterprises in the building materials industry in the current control process provide for their balanced development and stability of the market and financial position.

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