Assessment of the Appropriateness of the Price Control of High-Tech Industrial Holding

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***Abstract* – The article presents an assessment of the feasibility of price management based on the analysis of methods of management impacts on the price management of high-tech industrial holding. Here you can find the types of price management and an example of experimental evidence of its feasibility.**

***Keywords* – high-tech industrial holding, price management, price.**

1. Introduction

The objectives of price management for a high-tech holding are universal. The only thing that in this case allows to localize management is the nature of management actions. Other features allow to differentiate price management (for example, on strategic, tactical, operational, short-term, medium-term and long-term and also for conditions of monopolization and non-monopolization, on usual and anti-crisis, etc.). Accordingly, price management is a management, where we use the appointment of prices in the broad interpretation as the actions.

These prices relate to:

- commercial products, which buys the enterprise;
- commodity production delivered by the enterprise.

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Thus, the competent price control affects both the scope of marketing: "input", in respect of production subcontractors, and the "output" in respect of the customers of commercial products.

Therefore, in relation to the modern Russian high-tech holding there are the following types of price management decisions:

- prices;
- price boundaries that can be set with varying degrees of certainty of boundaries;
- regulated pricing procedures with varying degrees of rigor.

As a rule, the first of these types of price management decisions is typical for all enterprises or members of the high-tech holding, and the second one or the third one is only for the holding company, which is also a structure-managing company. Immediately, we note that in accordance with the Russian legislation, the holding company cannot assign prices for commodity products of the holding companies directly. Although, of course, this prohibition is quite easy and corrects costs.

2. Methodology

Based on the above considerations, it seems reasonable to make the following conclusions:

- now in the conditions of the Russian economic realities it is obligatory to have the compensation from the customer to the supplier for the delivered commodity production irrespective of its monetary or non-monetary character determined by conditions of emergence and the size of the contract signed by them;
- the price-like characteristic of this compensation is multiple, but it is correctly reduced to a tuple (sequence) of the sizes of single transfers of money by the customer to the supplier at some discrete moments of time. This interpretation also considers the near-price terms of contracts (fines, penalties, etc.), as well as revisions of the price terms of contracts;
- the values of these one-time enumerations can theoretically be arbitrary, limited only by physical boundaries;

- stereotypical interpretation of commodity products price is a special case of broad interpretation obtained through the introduction of the uniqueness of the moment of transfer compensation;
- species diversity of management is determined by a number of basic characteristics of management, among which there is the nature of management decisions;
- price management is defined as the management in which management decisions are made and management actions are implemented at the prices of commodity products in an expansive interpretation.

Now we consider if the price intra-holding management is appropriate and feasible.

Regarding the feasibility of such control in a fraction of the cost of alternatives does not actually exist [1]. This occurs due to the fact that in accordance with the current Russian legislation, the value of the contract price for commodity products is a prerequisite for any contract of economic entities, including the above-mentioned supply contract, considered as an expansive generalization.

The situation is more complicated with the other two types of price management implemented by the holding company within the intercompany hierarchy (framework and procedural regulation) [2].

The enterprise of the holding may use the following tools of their discipline:

- to introduce appropriate regulations in the constituent documents regarding the competence of indirect price discipline of holding companies;
- to make decisions as participants at the general meetings of the participants of the holding companies in terms of their indirect price discipline;
- to make decisions on indirect price discipline of the holding companies through the channel of the boards of directors of the holding companies, which have the right to approve their management strategies.

Of course, the option of administration through the line “administration of the holding company – administration of the holding companies” is excluded from consideration as obviously illegal. However, these tools seem to be vulnerable in terms of judicial and administrative appeals, because here the border of direct intervention of participants of legal entities in the direct administrative activities of the directorates of enterprises is vague [10].

It is proposed to use a mechanism in which the holding enterprises enter into a contract regarding their incentives in terms of voluntary adherence to management recommendations. It is possible that we can offer other ways of introducing a soft vertical price administration.

Thus, it was established that above that price intra-holding management in all three types is either indispensable or possible.

Now it is necessary to find out how far it is administratively expedient to carry it out in respect of result usefulness.

All three selected types of price management are ultimately reduced to absolute values of prices. Therefore, it is sufficient to identify the productivity of optimization of prices for commodity products [11].

It should be emphasized that the profile price sensitivity should be studied in relation to each enterprise member of the holding and the holding as a whole:

- apart in relation to price terms of delivery of the relevant commodity products from subcontractors;
- apart in relation to the price terms of the supply of commercial products for customers;
- complex in relation to the price terms of delivery of commercial products for subcontractors and customers.

The obligation of such triple analysis is due to the fact that the presence of one or more of the listed sensitivities does not mean the presence or absence of others. It is possible to set and solve the problem of finding the trajectory of insensitivity of financial and economic results of production and economic activity of the enterprise in the combined space of prices of subcontractors and customers [3]. A similar statement is true of the opposite – the absence of any sensitivities does not necessarily mean the absence or presence of others.

If there is a lack or insignificance of all specified sensitivities, then intercompany price management is ineffective, because the expenditure of resources for management in conditions of insensitivity of the management object to management influences not only can not lead to the achievement of productive management goals, but will inevitably worsen the financial and economic condition of the enterprise and its financial and economic results due to the appearance of an additional component of costs.

The absence of a significant dependence of the considered nature on the prices of the commodity profile products supplied by the enterprise in question may, for example, occur at very high values of receivables and payables [4].

There is an assumption, which is not narrowing the generality of calculations and constructions, the legality of the following deductive summaries:

- the presence of at least one of the sensitivities for at least one of the enterprises or members of the holding means the sensitivity of the entire holding to price management;
- the complete absence of all sensitivities for all enterprises means the insensitivity of the entire holding to price management.

On this basis:

- for experimental proof of the holding's sensitivity to price management, it is sufficient to identify the presence of at least one of the sensitivities for at least one of the holding's member companies;
- for experimental proof of the lack of sensitivity of the corporation to price management, it is necessary to identify the absence of all sensitivities for all enterprises or members of the holding.

Characteristics of sensitivities, in turn, are parameterized by the conditions of entrepreneurial activity and the initial financial and economic condition of the enterprises or members of the holding. Therefore, the sensitivity is to be evaluated in the vicinity of some point in the parameterizing space [5].

Accordingly, it is necessary to assess the actual sensitivity of the financial and economic results of production and economic activity in natural conditions, which can be done only for a retrospective interval, close enough to the right border at the time of the assessment of price sensitivities [12].

Now there are several fairly similar theoretical and applied approaches to the evaluation of the required sensitivities.

In the first of these approaches, the evaluation of the required sensitivities is carried out by a group of homogeneous enterprises (enterprises with a similar initial state, functioning and developing in close conditions), which allows, based on the identification of the scatter values of their financial and economic results, to identify the desired characteristics of sensitivities, which will have a nature close to statistical [6].

However, due to the sufficient uniqueness of the holding companies, this approach is unacceptable.

The second well-known approach to analytical estimation of price sensitivities involves the restoration of spread estimates for one enterprise based on data for different financial periods. Any enterprise or specific enterprise may be chosen. Thus, we show the natural requirement concerning similarity of initial states and external conditions of functioning for various calendar periods. In this case, there is also a similarity with statistical estimates, but for ergodic processes [7]. However, this approach has to be rejected for the considered situation. First, the ergodicity of the price process has not the proof, and, second, the action of a large number of powerful deergodicity factors is obvious.

Therefore, it is advisable and acceptable to apply the third conceptual approach, implying a variant retrospective forecasting of financial and economic results of production and economic activity of the enterprise. This approach, in turn, can be implemented in three different ways:

- by emulating the parametrized characteristics of the balance sheet transactions, which is more than technically difficult even in the presence of developed software support for accounting and audit analysis;
- by expert way, which generates accuracy uncertainty and low evidentiary value, as well as an unacceptably high level of estimated errors;
- on the basis of retrospective variant forecasts of financial and economic results on the economic and mathematical model of the enterprise. The last method of implementation of the third previously chosen approach and applied in the study [8]. The meaning of this author's method of estimating price sensitivities is to plan, to conduct and to process the results of a group of retrospective computational experiments on the software implementation of the economic and mathematical model of financial and economic condition of the enterprise, followed by the calculation of the relevant characteristics of sensitivities.

We are going to use this method for estimation of sensitivities for two of the enterprises or members of some hypothetical corporation: Enterprise 1 and Enterprise 2.

There are the source data in Table 1. and Table 2.

Table 1. Initial data for estimation of price sensitivities for Enterprise 1

Parameter	In fact, in the accounting year
Sales of specialized commercial products for a year, *m*	904 236
Sales volume of non-core commercial products for the year, *m*	21 186
Sales volume of profile commodity products in value terms for the year, *$ m.*	711,260
Sales volume of non-core commodity products in value terms for the year, *$ m.*	22,007
Cost of specialized commodity production for the year, *$ m.*	636,692
Cost of non-core commodity products for the year, *$ m.*.	20,864
Program of repayment of accounts receivable for the year, *$ m.*	82,003

Program of repayment of accounts payable for the year, *$ m.*	41,425
Program of fulfillment of obligations on previously received loans (average) for the year, *$ m.*	218,477
Volumes of innovation and investment program for the year, *$ m.*	17,152
Volume of the company's own current assets at the beginning of the period, *$ m.*	150,698

Table 2. Initial data for estimation of price sensitivities for Enterprise 2

Parameter	In fact, in the accounting year
Sales of specialized commercial products for a year, *m*	1046
Sales volume of non-core commercial products for the year, *m*	731
Sales volume of profile commodity products in value terms for the year, *$ m.*	4,647
Sales volume of non-core commodity products in value terms for the year, *$ m.*	3,650
Cost of specialized commodity production for the year, *$ m.*	3,544
Cost of non-core commodity products for the year, *$ m..*	2,255
Program of repayment of accounts receivable for the year, *$ m.*	1,718
Program of repayment of accounts payable for the year, *$ m.*	10,929
Program of fulfillment of obligations on previously received loans (average) for the year, *$ m.*	4,630
Volumes of innovation and investment program for the year, *$ m.*	1,383
Volume of the company's own current assets at the beginning of the period, *$ m.*	2,537

These data are hypothetical, but they have the specifics of one of the representative retrospective management situations in the Russian nonferrous metallurgy.

For each of these two enterprises, we will form plans for computational experiments, specifying unified relative variations of price conditions (Table 3.). The size of these relative variations will be taken as 10%, and the variations will be segmented. When conducting more detailed studies of price sensitivity variations can be implemented more, and the separation between them are selected based on the conditions of solving the problem of evaluation.

Table 3. Unified plan of computational experiments to assess the sensitivity to the prices of supply of subcontractors and the prices of supply of customers

Price of delivery of commodity production of subcontractors	**The cost of delivery of commercial products to customers**		
	Actual – 10%	**Actual**	**Actual + 10%**
Actual – 10%	$Э^{subc-cust}_{11}$	$Э^{subc-cust}_{12}$	$Э^{subc-cust}_{13}$
Actual	$Э^{subc-cust}_{21}$	$Э^{subc-cust}_{22}$	$Э^{subc-cust}_{23}$
Actual + 10%	$Э^{subc-cust}_{31}$	$Э^{subc-cust}_{32}$	$Э^{subc-cust}_{33}$

The proposed method of estimating price sensitivities has been extended to a more general and fundamentally possible case than the one that has arisen in practice [9].

For example, the results of computational experiments conducted in accordance with the plan are summarized in the Table 4.

Table 4. Results of computational experiments conducted in accordance with the plan

Enterprise	**Parameter**	**Prices**			
		Price of delivery of commodity production of subcontractors	**The cost of delivery of commercial products to customers**		
			Actual – 10%	**Actual**	**Actual +10%**
Enterprise 1	Net profit	Actual – 10%	Deprived of semantic content due to the tolling nature of supply by subcontractors		
		Actual	-24,04	36,64	87,43
		Actual + 10%	Deprived of semantic content due to the tolling nature of supply by subcontractors		
	Cash balance	Actual – 10%	Deprived of semantic content due to the tolling nature of supply by subcontractors		
		Actual	-68,39	-7,71	43,08
		Actual + 10%	Deprived of semantic content due to the tolling nature of supply by subcontractors		
Enterprise 2	Parameter	Actual – 10%	Deprived of semantic content due to the tolling nature of supply by subcontractors		
		Actual	-0,24	0,17	0,60
		Actual + 10%	Deprived of semantic content due to the tolling nature of supply by subcontractors		
	Net	Actual – 10%	Deprived of semantic content due to the tolling nature of supply by subcontractors		
		Actual	-12,92	-12,51	-12,09
		Actual + 10%	Deprived of semantic content due to the tolling nature of supply by subcontractors		

3. Conclusion

The following analytical statements are derived from the results, estimates and interpretations:

- financial and economic results of the enterprises or members of holding are sensitive to price variations in general, and in some cases are very sensitive (hypersensitive). For example, for the considered enterprises on 1% of price variation for the commodity production delivered to customers, it is necessary from 0,33% to more than 78% of increments of sizes of financial and economic results of production and economic activity of these enterprises;
- price sensitivity is significantly different for different categories of financial and economic results and enterprises, as well as non-identical for different areas of variation;
- high price sensitivity of the financial-economic results can produce the effects of the strong economic and financial instability of companies and the group as a result of cooperation and in some sense natural monopolies;
- the current level of prices for specialized commodity products is close to the point of ensuring the non-profit of enterprises, but in all considered cases, enterprises are shifted to the zone of initiating their financial insolvency and the indispensable need for external borrowing.

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