FINANCIAL RISK ANALYSIS IN THE BUILDING SECTOR: A CASE STUDY OF ROMANIA (GALATI COUNTY)

Nicoleta Bărbuță-Mișu*
"Dunărea de Jos" University of Galati, Romania

Abstract. *The importance given to the problem of capital structure comes from the influence of debt on equity profitability (financial leverage) and the financial risk induced by debt. This paper is actually an analysis of the evolution of financial risk in the building sector during 2001–2008 on a sample of 11 enterprises in the Galati County, Romania. In this approach, we used information from the balance sheets of enterprises, provided by the Register of Commerce. To carry out this analysis two methods were used, which rely on the breakeven point and the leverage.*

Analysis of aggregate data reveal a low fluctuating trend of financial risk, which shows that by the end of 2008 the effects of the economic and financial crisis still have not been felt as much as statistics show in 2009. The conclusion that emerges from this study is that the world crisis produces major effects on the building sector, but they can be seen a bit later. The effects are disastrous for economy (lack of work, offs of staff, etc.), which is why the government began to seek solutions to relaunch this sector.

Key words: *financial risk, capital structure, breakeven point, financial leverage, building sector, business risk*
JEL classification: G32

Introduction

In general, the concept of risk expresses the possibility or probability of a fact or event with implications (direct or indirect) on the company's financial results. The risk production can take the following aspects: appearance of the inability to reach a critical threshold, to have sufficient liquidity to honour its debts or to reach a profitable situation.

The risk may also lead to the inefficiency of the result to the estimated value. It is the case of a return on equity lower than shareholders' interests. This tone is reflected in how the financial diagnosis takes into account the risks inherent in financial restrictions. While solvency naturally considers the risk of insolvency, profitability includes examining:

- the ***operational risk***, expressed by the probability of a negative result;
- the ***financial risk*** on the probability of return on equity below the expectations of shareholders.

* Department of Finance and Economic Efficiency, "Dunărea de Jos" University of Galati, Domneasca Street No. 47, Galati, 800008 Romania; e-mail: Nicoleta.Barbuta@ugal.ro

These risks are not independent. Apparently, financial stability is analyzed from the balance sheet and the profitability determined on account of the results. The correlations are numerous. For example, a very important degree of debt will lead to financial expenses which decrease sharply the profitability. Among other consequences, this will prevent obtaining a liquidity sufficient to honour the commitments. The various tools for risk analysis confirm inter-relationships between these concepts (Tabara et al., 2001).

In this paper, I tried to analyze the evolution of financial risk on a sample of 11 companies acting in the building sector, in which Romania took the first place within the European Union in what concerns the production growth rate by March 2008, with an advance of 32.5% as compared to the similar period in 2007, in accordance with the data provided by the European Statistical Office, Eurostat. This implies that the Romanian building sector registers a fast growing rate by releasing products able to meet the exigencies of the contemporary market from the economic, social and environmental points of view (Bărbuță-Mișu, 2009a). The building sector also provides for many workplaces and may be considered an important provider of work force in Europe, as the majority of Romanian immigrants work in the building sector (Bărbuță-Mișu, 2009b).

The time period considered for data collection from the enterprises is 8 years (2001–2008), which means that we managed to grasp the time evolution of financial performance for the enterprises under study. One essential condition taken into account when establishing the sample was that the enterprises active in this sector show continuous activity during the chosen time interval. This condition greatly reduced the number of potentially sampled enterprises, as a great number of enterprises had closed their activity while others were only beginning it.

The greatest problem we faced was to identify the building sector enterprises active in Galati County, for which the Ministry of Finance has yet to give a solution. Thus, searching for these enterprises was mainly based on their significance. So, there were identified 11 enterprises: 2 large, 7 medium and 2 small. We did not manage to include any microenterprise in our sample because of their weak significance on the county level and a lack of continuous activity in this period.

The information used in this study was collected from the financial statements of enterprises, obtained by the Commerce Register of Galati: balance sheets, profit and loss accounts and explanatory notes such as claims and debts and fixed assets – gross values and depreciations.

The sample included the following representative enterprises from Galati County I.C.M.R.S. S.A., Vega 93 S.R.L., Confort S.A., Arcada Company S.A., Constructii Avram Iancu S.R.L., Constructii si reparatii S.A., Constructii feroviare S.A., Moldovulcan S.A., Arcada S.R.L., Sorex S.A., Consal S.R.L., specialized in construction of buildings or parts thereof, civil and other special works of construction, works of technical-sanitary installations and other works of finishing the construction of highways, roads and rental of the equipment for building and scrapping.

The selected and analyzed enterprises in 2008 represented 0.936% of the total number of business activity in the building sector of the county (1184 enterprises) and achieved a turnover of 120,87 million euros, i.e. 2.91% of the turnover of the building sector of the county. In these enterprises worked 4658 employees, i.e. 29.845% of workforce employed in the building sector of the county, or 3.997% of the total persons employed in the county.

1. Background literature

The issue of risk, certainty and uncertainty has always concerned experts in all fields. Usually, it examines the risk and uncertainty as opposite to certainty. Business always involves a certain degree of risk. The risk – inherent for any activity – means the outcome variability under the environment pressure. Generally, it can be defined as uncertainty likely to cause harm, loss, etc.

The return on any activities considers not only the risk that is involved. Also, the operators assume the risk in making a business only by return that they are expecting to gain from that activity. The concept of risk is inextricably linked to profitability. The results of a business depend on random factors that occur in all moments of the supply–production–distribution process.

The risk becomes a brake on the development and expansion of any activity, whereas the decision process is difficult. Any efficient business can be effective under condition that it is protected from the negative effects of risk. In the Romanian literature, some authors consider that for any economic activity, risk is an exogenous variable opposite to profitability and that "the risk is the profit return compared to the average return in some years" (Stancu, 1997) or "the variability outcome affecting the return on assets and therefore the invested capital" (Manolescu, 1999).

Forecasting the risk expresses the profit variability relative to the hope of return. Its measure is given by the dispersion and standard deviation of the profit according to the workload (Stancu, 1997). The risk of an asset is "probable variability of future profitability" (Halpern et al., 1998), so the risk is likely to achieve a lower cost than predicted.

The risk analysis of a business is to identify inherent risks and assess the economic and financial consequences, direct and indirect. Upon estimating the business risk, the leadership must find effective solutions to reduce and, if possible, to eliminate it.

Many experts believe that "financial risk characterizes the variability of results under the company's financial structure". The capital of a company consists of equity capital and borrowed capital which fundamentally differ in the cost they generate. A company that makes use of loans must pay the financial costs involved. The corporate borrowing, by its size and cost, drives the variability of results that change the financial risk (Dalotă, Dalotă, 2000).

Financial risk arises when a company turns to loans to finance its activity. This risk depends on the company's financial structure and indebtedness. If the decision to invest

determines the business risk (operating), then the financing decision creates a financial risk. To conduct any business, financial resources are necessary, which may be their own or borrowed. Equity, which belongs to shareholders, is paid in dividends, and the borrowed capital is remunerated by the interest paid. The financial lever appears only if the return on equity obtained from calling in loans is grater than the return on assets.

This is the additional risk borne by shareholders as a result of corporate decision to call in loans. Theoretically, the company has a certain degree of risk inherent to its activities, which is a risk business, and when they call to credit it is an additional risk to shareholders, the financial risk (Halpern, et al., 1998). The total risk attached to equity yield results from the variability of the equity yield rate. Part of this risk is a risk of exploitation explained by the variability of economic assets. The financial risk arises from the variability of the difference between equity return (total risk) and economic return on assets (operational risk) (Brezeanu et al., 2003).

Thus, financial risk exists only because of the sensitivity (variability) of results of operations, i.e. because of the risk of exploitation that multiplies it. If the company has debts, the financial risk is higher. Shareholders are not told about the financial risk in the same way as financial creditors who are less at risk because they have priority in recovering debts. Shareholders bear both financial risk and operational risk, i.e. the overall risk. The influence of financial risk on the overall risk can be seen in four aspects: the volatility of net profit (net profit per share), covering the financial expenses, structural risk, and the reduction of future financing flexibility.

First, even if the return on equity is high, a substantial financial leverage causes a great *instability in the net profit*, i.e. on the volatility of dividends distributed per share. Therefore, the shareholder will claim a "premium" to cover the risk.

In the *coverage of fixed financial commitments*, if the projections are not realistic, the company may not have sufficient cash to pay the interest and repay its debts. If the future cash-flows are greater and more stable, the company will have a higher capacity of debt (Keasey et al., 2005). Since the financial risk depends, in particular, on the enterprise ability to cover its fixed financial expenses, the analysis of debt decision should be considered when formulating the plan for funding and the cash budget, to track weather the anticipated cash-flows will be sufficient to cover the liabilities.

The most important factor in determining the capital structure of an enterprise is *business risk*. This is the inherent change in the anticipated future incomes on assets used, if the company did not resort to loans for financing. The business risk varies from one area of activity to another, and in the same area of activity from a company to another. Small enterprises or those who produce a single product are most affected by business risk.

The key factors which business risk depends on are (Halpern et al., 1998):

- *variability of demand* – a stable demand for enterprise products, leading to a reduced business risk;

- *price variability* – the prices of products and services sold are more stable when the business risk is lower;
- *variability of factors of production prices* – if the purchase prices are more volatile, the business risk is higher;
- *capacity of sales prices adjustment to changes in purchase prices* – a high capacity for adjustment of prices of products sold at prices of inputs means a lesser degree of business risk; this factor is influenced by inflation;
- *extent to which costs are fixed* – if the demand decreases and the company faces a major proportion of fixed costs in the total cost, the business risk increases.

Each of these factors is partly determined by the characteristics of the field of activity, but each is also controlled to some degree by the driving factors. Business risk may change over time due to changing the competition structure in the economic branch concerned, technological changes or changes in society and in the wider economy. Currently, the food industry and food retail trade are given as examples of economic sectors with a low business risk, while industries whose operations are cyclical, such as steel, are perceived as having a high risk business.

In general, business risk is a direct function of capital allocation decisions (Jordan et al., 2007). These decisions affect the nature of enterprise business and its asset composition. If the business risk of a new project differs from the risk of existing projects, the optimal ratio between debt and equity will be changed and will trigger changes between business and financial risks (Eiteman et al., 2007).

Financial risk is a result of long-term financing decisions. It concerns, on the one hand, the increase of the variable of incomes of the holders of common shares and, on the other hand, the increase of financial insolvency probability hanging over the company if the owners choose to use the financial lever. It follows from the fixed costs of borrowing or limited costs of preferential shares, which increase the potential variability of the earnings incumbent to the common shareholders of the company, thus increasing the risk.

Thus, financial risk is dependent on two elements. The first is the greater fluctuation of gains on joint action arising from pre-emption claims, fixed or limited, on the flow of revenue that have as holders the company creditors. The second element concerns the possibility of a limited flexibility, financial constraints or, at worst, a state of bankruptcy as a result of contracting such loans.

Normally, an enterprise has a certain degree of risk inherent in its business. It is a business risk. By using debt and preferred shares, the company focuses its business risk on common shareholders. But we can conclude that the financial risk is the risk to shareholders over the business risk arising from the use of financial lever. If the financial structure of the company is indebted, the financial risk is higher, since the increases the probability of financial insolvency of the enterprise.

Financial risk analysis can be done both on the breakeven point and by analysing changes in the return on equity due to the financial policy, which can be followed by a financial leverage effect (Eros-Stark, Pântea, 2001). The financial lever quantifies, on the one hand, the impact of credits on the return on equity, return on assets and the average cost of financial debt (interest rate) and, secondly, the level of indebtedness.

2. Financial risk analysis based on break-even

Financial break-even is the point where operating income covers the operating expenses and interest charges (Eros-Stark, Pântea, 2001). The financial break-even is calculated from the relationship:

$$Ve_{PR}^{f} = \frac{C_f + \left(Ch_f - V_f\right)}{1 - \frac{C_v}{C_e}} = \frac{C_f + Ch_d}{r_{mcv}},$$

where:

Ve_{PR}^{f} – operating income related to financial break-even;
C_f – total fixed costs;
Ch_f – financial expenses;
V_f – financial income;
C_v – total variable costs;
V_e – operating income;
Ch_d – interest charges;
r_{mcv} – argin ratio on variable costs of operating income.

The financial risk assessment on the break-even was done using the following indicators calculated from the data of the 11 enterprises involved in the study (Annex):

a) the position indicator to the financial break-even: absolute $I_{poz} = V_e - Ve_{PR}^{f}$ and relative (Fig. 1) $I_{poz(\%)} = \frac{I_{poz}}{Ve_{PR}^{f}}$;

b) the moment of achieving the financial break-even (Fig. 2): $P_m = \frac{Ve_{PR}^{f}}{V_e} \times 365$;

c) the coefficient of elasticity (Fig. 1): $k_e = \frac{V_e}{V_e - Ve_{PR}^{f}}$.

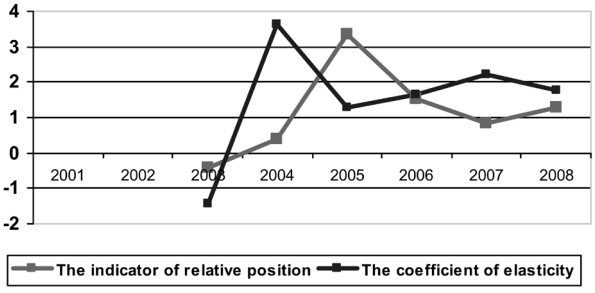

FIG. 1. **Financial break-even indicators**

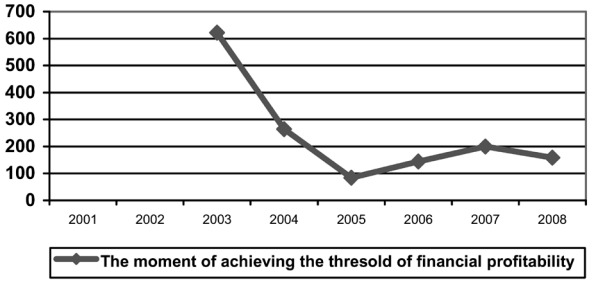

FIG. 2. **The moment of achieving financial break-even**

For the period 2001–2002, our data lead to inconclusive results because of the negative value of the variable cost margin. In 2003, the break-even was higher than the operating income by 35,812,549 euros (the absolute position indicator is negative), which corresponds to the negative current result and net income, but also to a moment of achieving the break-even within 622 days. The negative position indicator and the coefficient of elasticity actually indicate a very high financial risk reflected in the loss made in 2003 by the building sector.

In the period 2004–2006, the break-even was below the level of operating revenue. The situation was most favourable in 2005 when the moment to achieve break-even was less than 84 days. Consequently, the lowest financial risk was in 2005, demonstrated both by the higher position indicator (absolute and relative) and the lowest coefficient of elasticity (1.30). In the period 2006–2008, this risk increased, and the moment of achieving the financial break-even fluctuated between 144 and 200 days.

3. Financial risk analysis based on leverage

The return on equity is a result of the efficiency of all commercial, operational and financial activities of the enterprise (Niculescu, 1997). Financial leverage, or an increase in financial efficiency, called the variation of return on equity, depends on the return on assets and the cost of credit (interest rate). Financial lever expresses also the impact of financial expenses (due to loans) on the return on equity of an enterprise (Brezeanu, 1999).

For a company that relies on credit to increase the return on equity, the return on assets must be higher than the interest rate paid for the credit. Otherwise, if the interest rate paid is higher than the return on assets, the result is reduced, leading to a reduced return on equity, which becomes lower than return on assets. In this case, it is said that the debt has an effect of "bat", whereas it decreases the return on equity (Stancu, 1997). Thus, financial leverage is based on financing any company's activities.

If the return on assets is higher than the interest rate, the situation is favourable for the shareholders and the return on equity is an increasing function of the indebtedness of

the company. In the reverse situation when the cost of credit is greater than the return on assets, the return on equity is a decreasing function of the indebtedness of the company. The leverage deteriorates the economic performance of the company; therefore it is necessary to minimize the ratio between debt and equity. When the return on assets is equal to the interest rate, the company is characterized by stability of its financial structure.

When the economic context is unfavourable, the acquisition of fixed assets, and thus the investments act, must be financed as much as the equity. In favourable circumstances, the investment act will be more efficient, profitable, as the proportion of loan financing is increasing.

A high level of financial leverage allows shareholders to obtain a high return on equity, but they are also exposed to a higher risk of significant loss if the return on assets is low. Also, using loans may lead to restricting the independence of the company's management, and creditors are interested in the indebtedness of the company.

Most often, those who grant loans measure the ability of an operator to borrow by the equity and permanent capital ratio. When this index is below 0.5, the landing capacity of the company is saturated, and therefore it will not find lenders to increase its permanent capital, which will result in a reduction of the level of this indicator to the company (Manolescu, 1999).

Creditors are interested more in the company's financial history and its liquidity and less in its working capital. The composition of the current asset and short-term commitments will be therefore of greater importance than the information about the fixed values and long-term commitments. Creditors are also interested in the results, because the current capacity to create profit often affects the future operations and profits.

Financial leverage is combined with the operating leverage. The combined effect is equal to the product of the operating and financial leverage. To determine the financial risk, we first need the value of return on assets (Table 1). It is defined as a ratio between the economic result and economic assets. We will use the economic result as the operating result value as it is more relevant than the operating gross surplus. The economic asset will result in the addition to the gross fixed assets, the working capital requirements and the availabilities.

TABLE 1. **Determination of the return on assets**

Year	Economic result	Economic assets	Return on assets
2001	-23,580,576	-1,884,413	***1.9842***
2002	-8,354,014	-12,334,014	***0.6773***
2003	-2,060,700	-11,090,503	***0.1858***
2004	2,738,368	29,005,171	0.0944
2005	20,151,882	47,599,521	0.4234
2006	12,688,811	60,406,749	0.2101
2007	11,272,971	49,261,036	0.2288
2008	17,201,462	62,512,771	0.2752

For the period 2001–2003, the return on assets is inconclusive because of the negative value of both the economic result and economic asset. Financial risk arises when there are variations between return on equity and return on economic assets as a result of borrowing. In these conditions, the return on equity was calculated (Table 2).

TABLE 2. **Determination of the return on equity**

Year	Net result	Equity	Return on equity
2001	-25,269,448	-20,467,065	***1.2346***
2002	-9,245,776	-24,190,083	***0.3822***
2003	-3,329,202	-24,687,846	***0.1349***
2004	1,834,450	16,887,591	0.1086
2005	16,699,500	31,535,400	0.5295
2006	10,373,900	39,490,383	0.2627
2007	8,323,372	39,730,834	0.2095
2008	13,802,043	55,016,017	0.2509

Like the economic return on assets for the period 2001–2003, the return on equity has inconclusive values because of the negative values of the net result and equity. Tables 1 and 2 show that there is a difference in the return on assets and the return on equity, which shows the presence of financial risk.

The financial risk is calculated as follows: $\sigma(r_C - r_A) = \sigma(r_A) \times \left(\frac{D}{C}\right)^2$, where:

$\sigma(r_C - r_A)$ – return on equity variance to return on economic assets;

$\sigma(r_A)$ – return on economic assets variance;

$\frac{D}{C}$ – degree of debt.

In Table 3 we present the determination of financial risk for the period 2001-2008:

TABLE 3. **Determination of financial risk**

Year	$\sigma(r_A)$	$\left(\frac{D}{C}\right)^2$	$\sigma(r_C - r_A)$
2001	-	11.4244	-
2002	-0.9159	6.2500	-5.7244
2003	-0.4409	5.8564	-2.5821
2004	0.1602	1.4641	0.2345
2005	0.3590	1.9881	0.7137
2006	-0.1330	1.2996	-0.1728
2007	-0.0287	1.7276	-0.0496
2008	0.0948	1.5990	0.1516

The evolution of financial risk in the period 2001–2008 is shown graphically in Fig. 3.

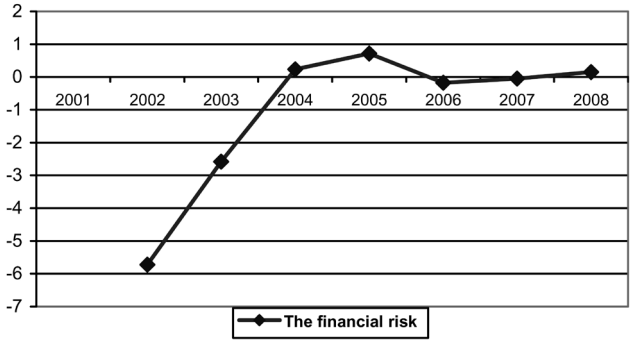

FIG. 3. **The financial risk**

Thus with reducing the indebtedness the financial risk is reduced. The financial risk for the building sector in this case was lowest in 2008 (11.99%) when the borrowing rate was also lowest (1.26), the variance of return on equity to return on assets being 9.48%. The return on equity was highest not in 2008, but in 2005 when the indebtedness was higher (1.41). Therefore, the interpretation of leverage that supposes the return on equity to increase with the degree of debt and vice versa is valid for 2004–2008, given that the return on assets is higher than the average interest rate.

For the period 2001–2003, the values of financial risk were inconclusive and determined by the negative values of the return on assets variance to the return on equity, which shows that the return on assets was lower than the average rate of interest. Even if the variance was positive, the financial risk in the building sector was very high due to the high degree of indebtedness in this period.

Conclusions

The application of two methods of assessing the financial risk in the building sector has led us to different results in respect of the year when the financial risk was lowest. Thus, financial risk assessment based on the financial break-even showed the lowest financial risk in 2005 when the break-even was achieved most rapidly (in 84 days), the coefficient of elasticity was the lowest (1.30) and the relative position indicator was high (333.34%).

For the period 2001–2003, both financial risk assessment methods showed a very high risk for the building sector, caused both by the negative variance of return on equity to the return on assets and the high indebtedness. The high financial risk is also reflected by the negative values of the net income and equity.

Financial risk assessment on the basis of leverage showed the lowest financial risk in 2008 (15.16%) when indebtedness was the smallest. In 2004, this risk was 23.45%, while in 2005 this indicator increased to 71.37%, after which the results of 2006 and 2007 became negative, mainly due to the decrease of indebtedness.

Although the study presented in this paper took into account a limited number of enterprises acting in the building sector, it reflects the reality on the national level. The building companies have seen an exponential growth of business in the recent years; also, it is the sector with the fastest growth rate (33% in the first half of 2008). In 2009, the world crisis affected the Romanian economy, particularly its sectors with high indebtedness; most exposed were the building sector and real estate developments, which affect the economic growth.

The building companies faced several problems, most serious being the increasing costs of raw materials, labour and credit. These are the companies that own maximum 20% of financing, have delays in selling buildings and run now from bank to bank for refinancing.

In 2009, all the companies of construction materials, interior design and all those working in building declined in turnover. This reduction of activity in the construction field has affected the economic growth. Companies in the building sector are threatened in the highest degree by insolvency, slow-down or delayed payments, i.e. currently the building sector faces a liquidity crisis, generating a chain reaction in the time of payment. This situation increases financial risk in this sector.

The same trend is manifested also in Europe. In the construction sector, seasonally adjusted production decreased by 1.1% in the euro area and by 0.6% in the EU-27 (November 2009 compared with the previous month, Eurostat, 2010). Among the member states on which data are available for November 2009, construction output fell in nine countries and rose in Poland (+8.8%), the Czech Republic (+6.4%) and Germany (+3.8%). The largest decrease was registered in Romania (–24.4%), Bulgaria (–22.5%), Slovenia (–18.1%) and Spain (–16.5%).

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ANNEX. **Calculation of indicators of financial risk assessment based on financial break-even**

Name of indicators	2001	2002	2003	2004	2005	2006	2007	2008
Operating income (euros)	101,375,525	47,815,899	50,938,578	74,576,286	92,988,642	115,427,794	136,920,610	148,005,681
Operating expenses (euros)	124,956,101	56,169,913	52,999,278	71,837,918	72,836,760	102,738,983	125,647,639	130,804,218
Operating result (euros)	-23,580,576	-8,354,014	-2,060,700	2,738,368	20,151,882	12,688,811	11,272,971	17,201,462
Total variables expenses (euros)	119,100,695	49,805,493	47,710,286	66,658,307	67,250,419	94,896,893	116,588,444	121,661,003
Total fixed expenses (euros)	5,855,405	6,364,420	5,288,992	5,179,610	5,586,341	7,842,091	9,059,195	9,143,215
Interest charges (euros)	569,622	472,306	208,963	549,428	353,349	274,871	2,088,295	2,324,070
Margin of the variables expenses (euros)	-17,725,171	-1,989,594	3,228,292	7,917,979	25,738,141	20,530,901	20,332,166	26,344,677
Margin of the variables expenses ratio	-0.1748	-0.0416	0.0634	0.1062	0.2768	0.1779	0.1485	0.1780
Financial break-even (euros)	-	-	86,751,127	53,959,526	21,459,346	45,634,772	75,069,281	64,423,768
The position indicator - absolute (euros) - relative (%)	-	-	 -35,812,549 -0.4128	 20,616,760 0.3821	 71,529,296 3.3332	 69,793,022 1.5294	 61,851,330 0,8239	 83,581,913 1,2974
The moment of break-even achieving (days)	-	-	622	264	84	144	200	159
The coefficient of elasticity	-	-	-1,42	3,62	1,30	1,65	2.21	1.77