THE 9TH EDITION OF THE INTERNATIONAL CONFERENCE
EUROPEAN INTEGRATION
REALITIES AND PERSPECTIVES

Diagnosis of the Viability of Industrial Companies with Treasury Sensitivity Coefficient

Bogdan Andronic[1], Vadim Dumitraşcu[2]

Abstract: Generally, the firm viability can be defined as the ability to ensure a profitable activity in terms of financial equilibrium. Therefore, estimation of viability can be achieved by determining specific profitability and equilibrium indicators to determine the extent to which the economic surplus released by the company's activity, manages, depending on the particularities of the economic and financial structures set up, to turn into cash. This happens because profitability alone is not sufficient to ensure the financial soundness of the company.

Key words: cash flow; assets; elasticity; self-financing; equity

1. Introduction

The treasury sensitivity coefficient relevance for assessing the financial viability, is given by the fact that its main elements can be decomposed into rates of return, of financial structure, of leverage ratio and assets and liabilities rates, that, within the diagnosis, may provide clearly indices on the financial situation of the firm. The relationship between financial viability and value of the company can be highlighted by incorporating the treasury sensitivity coefficient in assessment calculations.

2. Body of Paper

A profitable company can encounter great difficulties in terms of liquidity and, generally, in the capacity of payment. However, any company that registers a positive variation of treasury (cash flow) is, at the same time, profitable. (Thauvron, 2007) The indicators of profitability and equilibrium allow only an overall estimation of viability, without shading the subtle effects of specific influence factors.

An more expressive indicator could be the **treasury sensitivity global coefficient** (sg_t):

$$sg_t = \frac{\frac{\Delta NT}{NT}}{\frac{\Delta GOS}{GOS}} = \frac{\Delta NT}{\Delta GOS} x \frac{GOS}{NT} = \frac{i\Delta NT}{i\Delta GOS}$$

where: iΔNT - net treasury growth index;

iΔGOS - gross operating surplus growth index

[1] Professor, PhD, "Danubius" University of Galati, Address: 3 Galati Boulevard, 800654 Galati, Romania, Tel.: +40.372.361.102, Fax: +40.372.361.290, Corresponding author: bogdanandronic@univ-danubius.ro.
[2] Associate Profesor, PhD, "Dimitrie Cantemir" University of Bucharest, Romania, Address: 176 Splaiul Unirii, Bucharest 030134, Tel.: +4021 330 8931, E-mail: vadimdu@yahoo.com.

By the very logic of its construction sg_t is an elasticity, measuring the relative variation of the net treasury caused by the gross operating surplus variation. sg_t is based on the assumption that GOS as gross potential cash flow released by exploitation is the essential source of net treasury (Copeland, Koller, & Murrin, 2002). The coefficient shows to what extent the percentage decrease or increase of GOS, leads to the percentage decrease, respectively to the percentage increase of NT. The gaps between NT fluctuation and that of GOS, are explained by the evolution of exigibility -liquidity ratio, ie through the sense and the intensity of changes in the volume of cash "fixed" in the floating capital necessary (FCN). (Dumitrașcu, 2012, pp. 58-60)

sg_t global coefficient can be decomposed into three partial elasticity coefficients: $e_{SFC/GOS}$, $e_{TC/SFC}$, $e_{NT/TC}$.

$$sg_t = \frac{\frac{\Delta NT}{NT}}{\frac{\Delta TC}{TC}} x \frac{\frac{\Delta TC}{TC}}{\frac{\Delta SFC}{SFC}} x \frac{\frac{\Delta SFC}{SFC}}{\frac{\Delta GOS}{GOS}} = \frac{\frac{\Delta NT}{NT}}{\frac{\Delta GOS}{GOS}}$$

$$e_{NT/TC} = \frac{\frac{\Delta NT}{NT}}{\frac{\Delta TC}{TC}} e_{TC/SFC} = \frac{\frac{\Delta TC}{TC}}{\frac{\Delta SFC}{SFC}} e_{SFC/GOS} = \frac{\frac{\Delta SFC}{SFC}}{\frac{\Delta GOS}{GOS}}$$

The coefficient $e_{SFC/GOS}$ expresses the sensitivity of SFC in relation to the changes in the level of GOS which is the main source of self-financing:

$$e_{SFC/GOS} = \frac{\Delta SFC}{SFC} : \frac{\Delta GOS}{GOS} = \frac{\Delta SFC}{\Delta GOS} x \frac{GOS}{SFC}$$

The report $\frac{GOS}{SFC}$ represents the share of gross cash surplus generated by operations (GOS) in total own internal financing resources of the company (SFC). If we denote this ratio with % EA, the relationship for calculating $e_{SFC/GOS}$ is:

$$e_{SFC/GOS} = \frac{\Delta SFC}{\Delta GOS} x \%EA \qquad (1)$$

The coefficient $e_{TC//SFC}$ measures the variation of the entire capital engaged by the company (TC) related to the variation of SFC as major funding resource. The total capital engaged by the firm finances the gross economic asset (the total financing needs) (Amadieu, & Bessiere, 2007):

TC = Gross economic asset = Fixed assets + FCN + Liquidities.

So:

$$e_{TC/SFC} = \frac{\Delta TC}{TC} : \frac{\Delta SFC}{SFC} = \frac{\Delta TC}{\Delta SFC} x \frac{SFC}{TC}$$

Or, the $\frac{SFC}{TC}$ ratio is nothing else but the rate of self-financing of the gross economic asset, measuring the self-financed part of it.

Noting with RSF the the $\frac{SFC}{TC}$ ratio, we rewrite the relation for calculating $e_{TC/SFC}$

$$e_{TC/SFC} = \frac{\Delta TC}{\Delta SFC} x R_{SF} \qquad (2)$$

The coefficient $e_{NT/TC}$ expresses treasury sensitivity in relation to relative changes of the total invested capital (TC):

$$e_{NT/TC} = \frac{\Delta NT}{NT} : \frac{\Delta TC}{TC} = \frac{\Delta NT}{\Delta TC} x \frac{TC}{NT}$$

The $\frac{TC}{NT}$ ratio is the reverse of $\frac{NT}{TC}$ ratio which represents the share of the net treasury (liquidities) in the gross economic asset (GEA). If we denote ($\frac{NT}{TC}$) by % GEANT its reverse becomes:

$$\frac{TC}{NT} = 1 \Big/ \frac{NT}{TC} = \frac{1}{\%GEANT}$$

We rewrite the expression for calculating $e_{NT/TC}$:

$$e_{NT/TC} = \frac{\Delta NT}{\Delta TC x \%GEANT} \qquad (3)$$

Integrating by multiplication operation, the relations (1), (2) and (3), we have:

$$sg_t = e_{SFC/GOS} x\, e_{TC/SFC} x\, e_{NT/TC} = \frac{\Delta SFC}{\Delta GOS} x \frac{\Delta TC}{\Delta SFC} x \frac{\Delta NT}{\Delta TC} x \frac{\%\, EA\, x\, R_{SF}}{\%GEANT}$$

And further,

$$sg_t = \frac{\Delta NT}{\Delta GOS} x \frac{\%EA\, x\, R_{SF}}{\%GEANT}$$

But changes in net treasury (ΔNT) is the cash-flow of the financial year (CF).

Therefore:

$$sg_t = \frac{CF}{\Delta GOS} x \frac{\%EA\, x\, R_{SF}}{\%GEANT}$$

% EA can be decomposed as follows:

$$\%EA = \frac{GOS}{SFC} = \frac{GOS}{TC} x \frac{TC}{Total\ debts} x \frac{Total\ debts}{SFC}$$

$(a) = \frac{GOS}{TC}$ is the gross economic rate of return, measuring the ability of the total capital engaged by the firm (TC) for ensuring its renewal and payment in as short period.

$(b) = \frac{TC}{Total debts}$ is the long-term solvency ratio (R_{LTS}) or overall solvency ratio, expressing the degree to which firm face total debts.

$(c) = \frac{Total debts}{SFC}$ is the rate of total debt refund capacity through internal financial resources (SFC).

The R_{SF} decomposition rates highlights the following explanatory rates:

$$R_{SF} = \frac{SFC}{TC} = \frac{SFC}{Tumover} x \frac{Tumover}{Equity} x \frac{Equity}{TC}$$

$(d) = \frac{SFC}{Tumover}$ is the gross margin rate of self-financing, showing the extent to which turnover provides own resources needed for development and payment of shareholders.

$(e) = \frac{Tumover}{Equity}$ expresses the rotation of equity through turnover.

$(f) = \frac{Equity}{TC}$ is the rate of global financial autonomy (R_{GFA}), showing the extent to which the firm relies on equity to cover the total financing needs.

$\frac{1}{\%GEANT}$ is the reverse of (NT/TC) ratio, reflecting the weight of liquidities in the gross economic assets of the company. This rate can be decomposed into the following factors:

$$\frac{e_{NT}}{TC} = \frac{Liquidities}{Debt\ due\ immediately} x \frac{Debt\ due\ immediately}{TC}$$

$(g) = \frac{Liquidities}{Debt\ due\ immediately}$ is nothing else but the Quick Ratio (RIL) or immediate payment capacity rate, characterizing the instantaneous debt repayment ability based on the existing cash.

$(h) = \frac{Debt\ due\ immediately}{TC}$ is a rate of liability structure, reflecting the share of debt due immediately in total liabilities and measures the pressure of immediate chargeability on the overall patrimonial structure of the company. (Caby, & Hirigoyen, 2005)

In case of financially viable firms, i.e. those which are profitable and at the same time balanced, sg_t has positive values. The following type-situations may be encountered, designating each a certain degree of financial viability:

- 0 <sg_t <1, net treasury increases at a lower rate when GOS increases by 1%, meaning that the increase of profitability (GOS growth) is obtained by a growing level of disparities on stocks, claims and operation liabilities (ΔFCN). The company is financially viable, but this quality tends to depreciate. The management must be careful to reverse the trend.
- sg_t = 1, net treasury increases in the same pace with GOS. Financial equilibrium reinforces at the same rate with the increasing profitability. It is the ideal situation of financial viability.
- sg_t> 1, the treasury is growing faster than GOS. The gain in profitability is obtained in the conditions of relative FCN decline, which leads to improved liquidity - exigibility ratio and therefore at the rapid growth of cash.

Financial sustainability is very solid. The management should be concerned about the judicious placing of the increasing cash surplus. The more sg_t is greater than 1, the more the financial viability is stronger.

- If sg_t = 0, it means that the net treasury is totally insensitive to GOS variations. Whatever GOS growth, it is fully absorbed by FCN, the treasury remaining unchanged. Is the minimum point of financial viability, under which any positive development in profitability occurs under the growing financial imbalance. The more sg_t is closer to zero with such the company is in a more precarious situation in terms of viability.
- An sg_t <0 is specific to companies with serious imbalances, unsustainable financially, with very low profitability or even losses and inadequate financial and patrimonial structures.

Financial viability trends captured by the sg_t coefficient, appear as straight lines or as a theoretical curves beam (Figure No.1) where the company can be placed at a given time.

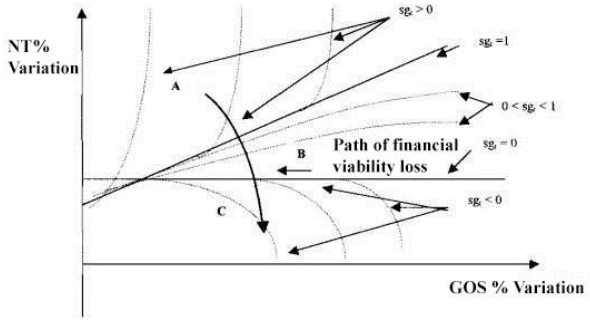

Figure 1. Financial viability appraisal based on sgt coefficient

Figure 1 defines three areas of financial viability. The area A, above the sg_t = 1 straight line, designates all developments corresponding to solid financial and increasing viability. Zone B, between sg_t =1 and sg_t = 0 lines, shows all developments suitable to a weaker financial viability. sg_t = 0 straight line is the threshold between viable and non-financial viability. Under this line, in C area, are located only non-viable financial developments. The straight line sg_t = 1, although corresponding to a uniform increasing dynamic of viability is also a threshold - between increasing and decreasing financial viability. Downward curve that leaves the A zone, crossing B area towards C area, is the path of financial viability loss. Financial management decisions and actions are based on the company's position in one of these areas.

We will consider that firm value is determined by the update of a constantly reproducible on an indefinite period of time cash- flow.

$FV_{UCF} = \frac{CF}{wacc}$ where wacc is the weighted average cost of capital

From this relation it follows that:

$CF = wacc \times FV_{UCF}$

Introducing the last expression in the calculation formula of the sg_t coefficient:

$$sg_t = \frac{CF}{\Delta GOS} x \frac{GOS}{NT}$$

and operating some transformations we get:

$$sg_t = \frac{sg_t x\ NT\ x\ i\Delta GOS}{wacc}$$

Noting with the letter ε the (sg_t /wacc) ratio, the above relationship becomes:

$FV_{UCF} = \varepsilon \times NT \times i\Delta GOS$

The last expression clearly suggests that between the firm size and value of ε coefficient there is a directly proportional relationship. If ε> 1, it means that the company releases a stream of liquidities in excess to the needs of wacc coverage. This excess flow remaining after the payment of capital providers (shareholders and creditors) through wacc, is fully assimilated by the firm, leading to the enriching of economic patrimony and enhancing further its value (Kim, & Kross, 2005, pp.753-780). The more greater is the value of ε, the more the consistency between treasury surpluses and wacc is higher, and the more the firm value FV_{UCF} is bigger. If ε <1, it means that the firm is characterized by serious mismatch between the wacc and the processes of creating treasury. In these situations, the treasury is not sufficient any more to pay the capital providers through wacc, an erosion of investment in firm value taking place and /or a funds withdrawal, events that lead to a lower firm value. ε = 1 has a neutral effect on the firm value.

The increase of economic patrimony (actually of asset value PV) is an important consequence of the company's financial viability. But to regard the financial viability as solid, is necessary that $\Delta FV_{UCF} > \Delta PV$: the growth of return value exceeds the growth of asset value of the firm. In other words, the (FV_{UCF} /PV) ratio must be higher than one and increasing.

Developments of ε coefficient and of (ΔFV_{UCF} /PV) ratio are interrelated (Figure No. 2).The diagram shows some possible developments of the company's value according to the ε coefficient.

Evolution A: rapid growth of FV_{UCF} (higher) and also of the PV (less), are due to a strengthen financial viability (ε> 1).

Evolution B: Company maintains its monetary viability (ε = 1). FV_{UCF} and PV grow more slowly until a certain ceiling.

Evolution of C: Financial viability decreases (ε <1), but FV_{UCF} and PV may increase slowly up to a certain moment in virtue that company still manages to exploit previously acquired positions.

Evolution D: If the firm fails to stop its financial viability decline through appropriate restructuring of business, FV_{UCF} and PV collapse are imminent.

Evolution of E: Restructuring of business consisting mainly in cleaning the patrimonial structure of the company by selling some assets and launching energetic recovery actions on the market, lead, after a rebound, to regain financial viability. In the first phase, due to reduction of economic resources, FV_{UCF} and PV will decrease. The decline is stopped when ε = 1. In a following phase, the growth of coefficient ε value will determine more rapid growth of FV_{UCF} and PV.

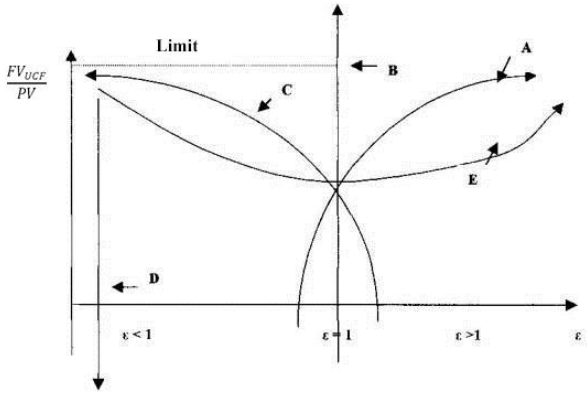

Figure 2. Type-developments of financial viability and company value

3. Conclusions

The complexity of the information provided by the rates in which sg_t decompose, the fact that they capture a variety of important aspects of the financial situation, primarily on profitability, equilibrium and solvency, entitles us to consider that sg_t is an relevant instrument for the analysis of financial viability.

The multiplying coefficient ε built on sg_t, indicates the degree of coherence between treasury variability in response to changes in relative profitability, exploitation operations and the weighted average cost of capital (wacc) level.

In fact, ε measures the company's ability to convert potential resources into actual money stock, to achieve on this basis investors payment at a minimum level required by them, that of the wacc, and to create over this minimum level surplus cash that will strengthen its patrimonial structure.

So, sg_t proves to be a very useful tool in the diagnosis of viability of industrial companies.

4. References

Amadieu, P. & Bessiere, V. (2007). *Analyse de l'information financiere. Diagnostic, evaluation, previsions et risqué/Analysis of financial information. Diagnosis, evaluation, and risk forecasts.* Paris: Edition Economica.

Caby, J. & Hirigoyen, G. (2005). *Creation de valeur et governance de l'entreprise/Value creation and governance of the company.* Paris: Edition Economica.

Copeland, T.; Koller, T. & Murrin, J. (2002). *La strategie de la valeur/The strategy of the value.* Paris: Editions d′Organisation, 2002, pp. 101-102.

Dumitrașcu, R.A. (2012). *Financial management of the entreprise. Concepts, models, instruments.* Bucharest: Editura Universitară, pp.58-60.

Kim, M. & Kross, W. (2005). The ability of earning to predict future operating cash-flow has been increasing – not decreasing. *Journal of Accounting research,* Vol. 43, no 5, 2005, pp.753-780.

Thauvron, A. (2007). *Evaluation d'Entreprise/Corporate Evaluation.* Paris: Edition Economica.