

## **CASH-FLOW SUSTAINABLE GROWTH RATE MODELS**

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**Abstract:** *The internal funding of a company is limited by the ability to generate enough cash-flow from operational activities. External funds aimed at growth are associated with increased risks and with the need to have investment projects. Recent research has shown that the spread of the financial crisis is associated with excessive external funding aimed at stimulating the growth of businesses. The limitations of external funding are well-known: capital market funding determines unwanted costs and changes in the ownership structure, while bank funding determines costs that erode operational margins. In the light of the above, it can be said that, in most circumstances, growth should be financed using internally-generated funds. Using the sustainable growth rate, managers and investors can establish whether their plans for increasing revenues are realistic and whether they are based on actual operational and financial performance.*

**Keywords:** *sustainable growth rate; Cash-flow determined models; Churchill and Mullins Model; Hamann Model;*

### **1. GENERAL CONSIDERATIONS**

One of the important aspects of working capital management is planning for funding the growth of current assets at the same time the sales grow, as the company develops. For this reason it is very important for the entrepreneur to know what the sales trends are and to know their effects on the company's working capital.

In close connection to the concept of working capital we have the notion of sustainable growth rate, which can be applied to a company, to a line of products, a market segment or a distribution channel.

A sustainable growth rate is in fact a growth rate that can be funded from the sales made in the circumstances of a habitual credit policy. Each time the business growth rate is superior to the sustainable growth rate it is necessary to inject additional capital, and this is a need that must be planned for in advance.

The sustainable growth rate is the maximum growth rate that company can sustain without increasing its financial leverage. (Campbell 2004).

A cash-flow based sustainable growth rate is the rate at which the company must maintain its sales so that its cash-flow remains constant (Hamann 1996). The sustainable growth is the percentage of annual growth of sales that is in agreement with the company's established financial policies (Higgins 1977).

The sustainable growth rate is the maximum growth rate a company can have while all its financial parameters are constant (Firer 1995).

The sustainable growth rate is the maximum growth rate a company can have without receiving any capital from investors or any long-term loans (Ross, Westerfield & Jordan 1995 and Snyman 1999).

The sustainable growth rate is the possible growth rate that can be obtained by setting four variables: profit rate, dividend distribution rate, debt rate and ROA, in the absence of increases in equity (Ross, Westerfield & Jaffe 1996). The sustainable growth rate is the maximum percentage of sales, assets or profit growth when the financial and operational parameters are in agreement with the management objectives and with the expectations of the market (Zantout 1990). The sustainable growth rate is the rate at which the company can sustain growth from the generated sales without requiring additional funding (Churchill & Mullins 2001).

The growth rate is the maximum percentage of sales growth that can be achieved based on operational target, on debt and on the dividend distribution rate (Van Horne 1997).

Sustainable growth is a growth of the need for capital that is funded using the company's own capital (self-financing) as well as borrowed capital in such a way that the leverage and the debt rate are not changed (Ion Stancu, Onofrei and Lupu).

Growth sustainability was developed as a measurement for determining the percentage by which a company can increase sales in the context of maintaining a set of financial policies. If sales grow at a higher rate, then certain objectives of the financial policies will not be attained and the financial stability of the company will be affected negatively (Higgins).

If a company develops faster than the sustainable rate growth, it will develop financial needs that cannot be met. According to Platt&Platt, this type of financial problem is the source of 47% of bankruptcies.

A growing company had an increased need for funding its working capital, both in order to develop its production facilities and for expenses. It is therefore necessary to reach a balance between cash generation and cash use (Churchill & Mullins). Churchill and Mullins developed the concept of self-financed growth rate, which is the growth rate a company can sustain without needing to resort to external funding sources. When a company limits its growth to the level of this rate, the growth won't generate cash-flow problems.

Higgins believes that companies have various ways of compensating for the growth of sales over the sustainable rate. They may increase their equity, reduce the level of dividend payments, may resort to external funding or implement cost-reduction programmes. It may happen that these options cannot be implemented for practical reasons. It may happen that the market does not react to the increase of equity, that the payment of dividends cannot be reduced, or that the company is a young one, one that has never paid dividends before. External funding may come at high cost or some companies may not be able to attract external funding. As a consequence, the company will have to decrease its current growth rate. Higgins advises managers to plan any sales increase the way they would manage any other part of the business.

Chan, Kaceschi and Lakonishak (2003) have studied the expectations for companies to maintain high growth rates. They have shown that companies with exceptionally high growth are few and far between. Only 10% of companies grow by more than 18% per year over a period longer than 10 years.

Starry and McGauchey (1998) define rapid-growth industries as those with growth rates of over 20%. Their opinion is that such growth within industries cannot be sustained because when a competitor enters a thriving industry, growth will no longer be favourable for the rest of the companies. Interest for new products disappears when markets are flooded with similar products. Starry and McGauchey's hypothesis is that top performers are those companies that position themselves in new areas, with a new potential for development. They define high growth as being above 10.5% per year, average growth as being between 5 and 10.5% per year, and low growth as less than 5% per year on a five-year period.

A "Fortune Global 500" analysis made by the *Center for Organizational Excellence of St. Gallen's University* in Switzerland in cooperation with ten companies points out the main growth factor as being the sustainable growth rate and the secondary factors being the markets and the management capacity.

The analysis underscores that fact that the companies that grow within the limits of the "growth corridor" perform better than other companies, even though the latter may grow faster than the former.

The "growth corridor", defined as the interval between the minimum growth yielded by competitive growth and the maximum growth yielded by the maximum sustainable growth rate, allows managers to see how fast and how healthy their companies can grow.

Company performance and growth sustainability are two of the many indicators monitored by various stakeholders, managers and investors. These indicators assist in the operational management of the company.

Many studies have been carried out in the context of sustainable growth, approaching areas such as sales, profit and capital structure. The research was expanded using cash-flow based analyses.

The biggest difference between the sustainable growth rate and the cash-flow sustainable growth rate concerns the definition of sales-generated cash and cash flow generated by the operational activities. The cash generated by sales is the cash that is reinvested in the growth of the company in agreement with the sustainable growth rate. As this cash is not obtained immediately, the cash-flow sustainable growth rate is a better measurement of sustainable growth (Greavu-Serban, 2015).

When the percentage of sales growth is lower than the cash-flow sustainable growth rate, cash-flow is generated from operational activities. When the sales growth is higher than the sustainable growth rate, the cash-flow from operating activities will be negative. This will show that the internal funds required for working capital are not sufficient and that external funding is needed. This leads to the questions: what would be a good procedure for ensuring sustainable performance in companies when using the sustainable growth rate? And if such a procedure exists, in the case where the sustainable growth rate is exceeded by income/revenue growth, which indicator becomes the most relevant in the case of specific circumstances?

As Churchill & Mullins show, the advantage of using the sustainable growth rate is that it helps provide a framework for short-term decision-making concerning:

- cost reduction;

- changing the profitability ratio;
- working capital management;
- changing the cash conversion cycle.

What matters most is not how fast a company can grow its business, but instead the route taken by this company towards this target.

The increase of competitiveness requires innovative means for optimising resources and without managing the working capital companies cannot achieve sustainable growth.

The performance of a company in terms of growth can be measured by referring to the values reached the previous year. In certain cases, financial indicators can be used to measure the efficiency of operations, assets and own capital.

According to Higgins (1997), return on equity and the dividend distribution rate provide financial managers with an important instrument for analysing growth rates and they can be used for comparing the performances obtained through the use of a certain set of financial policies.

The growth of working capital can be measured by the changes undergone by: cash, stocks, short-term receivables and payables. These variations show the requirements for working capital. It is important to maintain a balance between generating enough cash-flow and the necessary working capital for the company. This balance is then an indicator for the kind of growth the company can sustain without needing to resort to external funding.

## **2. SUSTAINABLE GROWTH RATE BASED UPON A CASH FLOW MODELS**

In order to find the sustainable growth rate, literature presents two categories of models: traditional models based on capital structure (debt:equity determined models) and cash flow-determined models.

In the first category we include the models developed by the Boston Consulting Group: Zakon (1968), Spraakman (1979), Ulrich and Arlow (1980), Johnson (1981), Higgins (1984), Lewellen and Kracaw (1987), Firer (1995) and Ross (2003).

Bearing in mind that company growth is also limited by the generated cash-flow, the newer models developed by Hamann (1996) and Churchill and Mullins (2001) use cash-flow as a factor that limits sustainable growth rate.

Hamann's model (1996) is developed starting from the assumption that cash flow from operating activities is the most important source of cash.

In this context, operations-generated cash-flow may be defined as follows:

$$\text{CFO} = \text{EBIT} + \text{non-cash items} - \text{interest} - \text{taxes} - \Delta\text{NCC:WC} - \text{dividends}$$

$$\text{EBIT} - \text{interest} - \text{taxes} = \text{PAT}$$

$$\text{CFO} = \text{PAT} - \Delta\text{NCC:WC} = 0$$

$$\text{PAT} = \Delta\text{NCC:WC}$$

where:

PAT = Profit after taxation

CFO = cash from operating activities

EBIT = profit before interest and taxes

$\Delta NCC:WC$  = changes in non-cash components of working capital;

The formula underlines the need to control the components of working capital, stock management and the credit policy in order to have a sustainable growth of cash-flows.

The model involves:

Calculating the net profit after tax (PAT)

Considering  $g$  = the sales growth for year  $x+1$

In the situation in which the ROA, the weight of overheads in sales and the tax rate remain constant, the profit equation for the year  $x+1$  can be written as follows:

$$PAT_{x+1} = Sales * (1 + g) * PAT/sales_x$$

Calculating the activity periods for components of working capital cycle

$$WCC = Inventory * \frac{12}{Sales} + Receivables * \frac{12}{Sales} - Payables * \frac{12}{Sales}$$

Calculating the changes in working capital

$$WCC = \frac{Sales}{12} (Inventory_{x+1} + Receivables_{x+1} - Payables_{x+1}) - \frac{Sales_x}{12} (Inventory_x + Receivables_x - Payables_x)$$

Given the fact that the components of the cash conversion cycle remain constant ( $Inventory_{x+1} = Inventory_x$ ,  $Receivables_{x+1} = Receivables_x$ ,  $Payables_{x+1} = Payables_x$ ), the equation becomes:

$$\begin{aligned} \Delta NCC:WC &= \frac{(Sales_x(1 + g) - Sales_x)}{12} (Inventory_x + Receivables_x - Payables_x) \\ &= \frac{g * Sales_x}{12} (Inventory_x + Receivables_x - Payables_x) \end{aligned}$$

Calculating the sustainable growth rate when cash from operating activities is zero or when  $PAT_{x+1} = \Delta NCC:WC_{x+1}$

$$(Sales_x(1 + g) * PAT/Sales_x) = \frac{g * Sales_x}{12} * (Inventory_x + Receivables_x - Payables_x)$$

The equation above shows that:

$$CFO = PAT - \Delta NCC:WC$$

$$PAT * (1 + g) = g * \frac{Sales}{12} * WCC$$

$$g = \frac{PAT}{\left(\frac{Sales}{12} * WCC - PAT\right)}$$

It follows that the longer the cash conversion cycle, the lower the sustainable growth rate for a given level of sales and of profit after tax.

Assuming that in the year x+1 the cash conversion cycle will increase, the sustainable growth rate will drop.

The formula sustainable growth rate was obtained based on the the general cash flow format:

Cash from operating activities – Cash to investing activities + Cash from financing activities = 0

In the case where in the year x+1 the shareholders wish to have dividends paid, the equation becomes:

$$PAT_{x+1} = Sales_x * (1 + g) * PAT/Sales * (1 - d)$$

where d = dividend retention rate

In the case where in the year x+1 the working capital will increase and an equity increase is also made, the equation becomes:

$$PAT * (1 + g) * (1 - d) - \left(\frac{Sales}{12} * (1 + g) * WCC_{t+1} - \frac{Sales}{12} * WCC_t\right) + \Delta SC = 0$$

where:

$WCC_{t+1}$  = working capital cycle in period t + 1

$WCC_t$  = working capital cycle in period t

$\Delta SC$  = share capital increase

The model also works when investing activities will be introduced. The model must be adjusted when borrowed capital is made because the interest will affect cash flow from operating activities.

The model proposed by Churchill and Mullins (2001) focuses on cash-flow management in generating a sustainable growth rate. According to them, a sustainable growth rate is the growth rate that can be achieved using operational means, without divestment and without external funding.

They identify three important factors in achieving sustainable growth:

- the operating cash cycle expressed in number of days (length of immobilization in stocks and receivables);
- the value of the cash tied-up in each operating cash cycle;
- the value of the cash generated during each cycle.

The operating cash cycle (OCC) includes the period of time in which financial funds are tied up in inventories as well as other working capital before payment is received from the services rendered.

$$OCC = \text{Days inventory held} + \text{Days Sales outstanding}$$

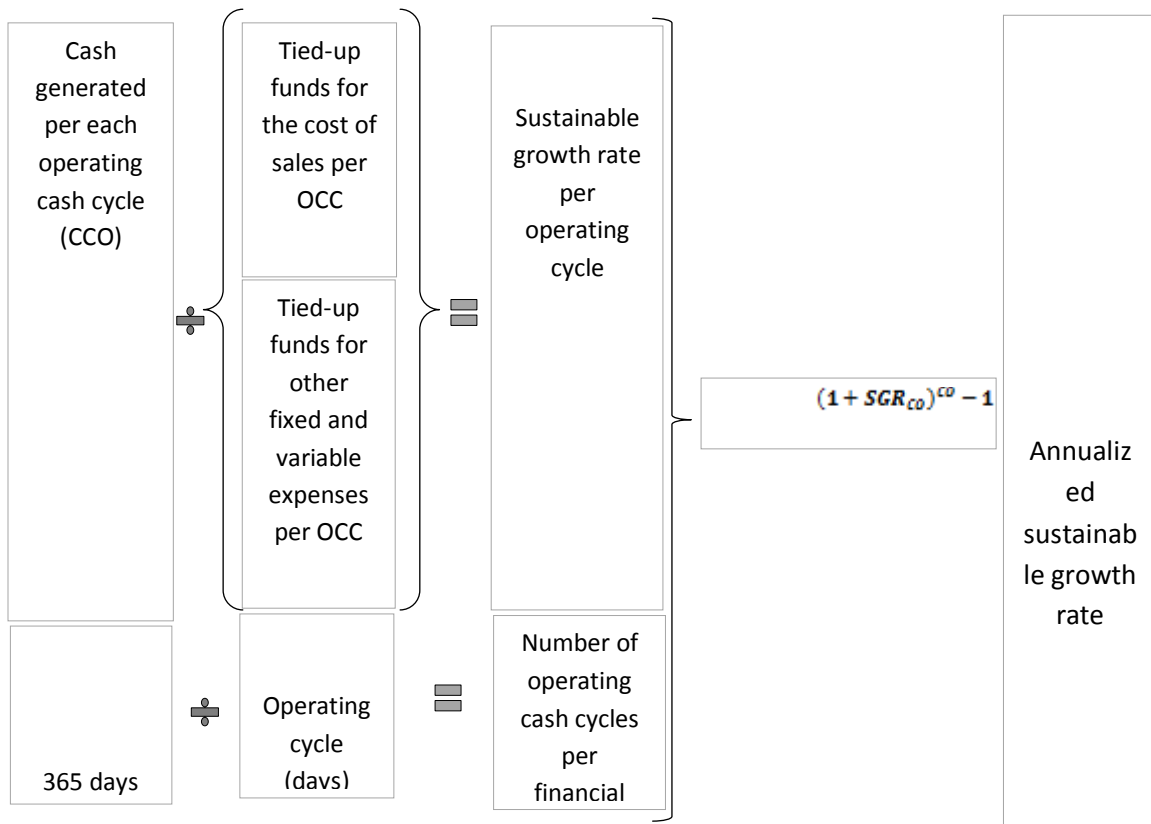
The funds required in order to fund the operating cash cycle are essential in calculating the sustainable growth rate, because the values of the cost of sales and of the other fixed and variable expenses are different:

$$\text{Tied - up funds cost of sales} = \frac{\text{Tied - up funds (in days)}}{\text{OCC (in days)}} * \frac{\text{Cost of Goods Sold}}{\text{Net Sales}}$$

$$\text{Tied - up funds other expenses} = \frac{\text{Tied - up funds other expenses (in days)}}{\text{OCC (in days)}} * \frac{\text{Other expenses}}{\text{Net Sales}}$$

The sustainable growth rate is influenced by the following four factors:

- profitability ratio. An increase of profitability ratio determines the generation of internal funds, with direct impact in achieving growth;
- asset turnover ratio. An increase of the net asset turnover ratio causes an increase of sales generated per asset unit. This decreases the need for assets based on the increase of sales, which results in the increase of the sustainable growth rate.
- financial policy. An increase of the total debt means additional resources and an increase of the sustainable growth rate.
- dividend policy. An increase in retention rate determines the growth of capital and implicitly the sustainable growth rate.



**Figure 1: Calculating the sustainable growth rate according to the Churchill and Mullins model**  
(Source: Hofman, E. / Maucher, D. /Piesker, S./ Richter P. *Ways Out of the Working Capital Trap*)

The Churchill and Mullins model allows the calculation of the growth rate based on the funds generated from current operational activities, as well as on the factors that contribute to and influence growth. The model provides a working instrument for making decisions from a management perspective through common operational and financial strategies, by commensurating their impact on the company's ability to fund growth.

The sustainable growth rate can be calculated for various types of companies, irrespective of size, for each business unit or for each market segment. The calculations can be made using both historical data and forecast data. This model for finding the sustainable growth rate can help managers understand the consequences of their decisions through a "What If"-type planning. The model can be used by manufacturing, distribution, retail and service companies.

### 3. CONCLUSIONS

Even though companies need to have a minimum of growth in order to perform well in the long term, too big a growth can generate problems. The danger lies in overshooting one's financial capabilities, as well as of one's management and market limitations.

Monitoring the current situation and the progress of a company by mapping the sustainable growth rate helps managers make sure that deficient resources are allotted in an efficient manner.

The models that rely on operational cash-flow highlight the need to control the elements of the working capital the models proposed by Churchill & Mullins and by Hamann can become useful tools for making decisions from a managerial perspective and help in understanding the consequences of management decisions in an organisation.

The sustainable growth rate serves as an element for setting a growth target using internally-generated funds. This rate can be increased by influencing its determinants. Potential actions may be categorized as follows: shortening the net operating cycle (by reducing the day's inventory held, decreasing the day's sales outstanding and increasing the day's payables outstanding), reducing the cost of sales and of overheads, and increasing the margin for sales.

An increase of turnover above the value of the sustainable growth rate will generate a scarcity of funds, and the company will need to resort to bank financing, changing its debt equity and thus creating financial costs. On the other hand, a turnover below the rate of sustainable growth will lead to a waste of available resources, thus generating opportunity costs.



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