

PROFITABILITY AND FINANCIAL ANALYSIS

I. PROFITABILITY ANALYSIS

1. The different levels of income

Analysing any income statement, from the top line of revenues generated by the firm to the bottom line of net income there are several intermediate levels of earnings, each representing a specific measurement of some form of performance. Let's take a closer look at the more important ones.

- a) **Gross Margin**, results from the difference between revenues and the cost of goods sold (COGS). A negative gross margin clearly points out toward a non-performing business that hasn't any chance to survive, as it is selling a product below its more direct costs. It is very common to calculate the Gross Margin as a percentage of revenues;
- b) **EBITDA (Earnings Before Interest, Taxes, Depreciation, and Amortization)**, It is the difference between revenues and all cash operating costs ((that is, all operating costs excluding depreciation) such as labour costs and external supplies and services. The EBITDA represents the ability of the company to generate cash from its operations (once the revenues are collected and the costs paid). A negative EBITDA implies that the business generates a financial deficit.
- c) **EBIT (Earnings Before Interest and Taxes)**, It is computed by subtracting depreciation from the EBITDA. This means that the EBIT is what remains after considering all the costs of producing what is sold including capital expenditure costs (depreciation of property, plant and equipment). The main difference from EBITDA is that a positive EBIT indicates that not only the company has the ability to pay its cash operating expenses but also to generate the resources needed to gradually renew its fixed assets in the maturity of their expected lives.
- d) **EBT (Earnings Before Taxes)**, income before taxes and therefore will be subject to taxation on income tax. It results of subtracting the net interest costs (interest costs minus interest revenues) on the EBIT. A positive EBT

implies that the company is able to generate enough earnings to pay the cost associated with its debt.

e) **Net Income (NI)**, net result or final outcome, is the income available to shareholders; they will decide (generally upon a proposal of the Board of Directors) in the General Assembly meeting the fraction of net income that will be distributed as dividends (the remaining fraction will be kept within the company as retained earnings and used as an internal source of funds to finance the company's activity).

Another type of result that is often used in several valuation exercises is the **NOPLAT – NET OPERATING PROFIT LESS ADJUSTED TAXES**. This is a theoretical concept, in the sense that computes the net income that the company would have ignoring the cost of debt, or by other words, the net income that the company would have if it was all equity financed. It is calculated by directly subtracting taxes to EBIT (but these taxes being computed from EBIT, as we ignore any interest costs).

2. Profitability ratios

While the absolute values of the different levels of income identified earlier may provide relevant information regarding the evolution of the company they don't offer meaningful conclusions both in terms of comparing with the competition (different companies with different sizes) as in terms of an efficient use of the resources allocated to the company. These two limitations can be overcome by using profitability ratios.

The first ratio is the **Gross ROA - Return on Assets:**

$$\text{Gross ROA} = \frac{\text{EBIT}}{\text{Assets}}$$

This ratio is a measure of the profitability of the business, as it confronts the operating profit with all assets that the company has. Often, it is computed only including the operating assets, that is, excluding all non-operating assets, assets

that the company has for some reason (an unused facility, a stake in another company maintained as a financial investment, etc.). In this case, all revenues (and costs) associated with these non-operating assets should be removed from EBIT.

Another ratio aiming to analyse the profitability of the business is the **ROIC – Return on Invested Capital:**

$$\text{ROIC} = \frac{\text{NOPLAT}}{\text{Invested Capital}}$$

Comparing with GROSS ROA, two major differences can be identified:

- The business income is net of taxes (use of NOPLAT instead of EBIT):
- Instead of using the total assets it uses the concept of invested capital

The concept of Invested Capital deserves a more detailed analysis. We can present it from two different views, an asset view and a resource view, representing the two sides of the same coin. The main idea is to identify what is the investment needed to conduct the business of the firm (asset view) or to identify the resources employed in the financing of that business (resource view).

Let's start with the asset view:

INVESTED CAPITAL = OPERATING NON CURRENT ASSETS + OPERATING CURRENT ASSETS - OPERATING CURRENT LIABILITIES

Or (taking into account, working capital is basically the difference between operating current assets and liabilities, as analyzed in more detail later in this text))

INVESTED CAPITAL = OPERATING NON CURRENT ASSETS + WC

Analyzing the concept a firm, to develop its business, needs its total assets related to the business (that is, we need to exclude all non-operating assets) but, the business, itself, automatically generates a given stream of resources (for instance, credit from suppliers) and, therefore, the value invested in the business is the total operating assets minus the current operating liabilities.

The resource view focus on the resources employed in the financing of the business of the firm:

CAPITAL EMPLOYED = INVESTED CAPITAL = EQUITY + FINANCIAL DEBT - NON OPERATING ASSETS

A by-product of ROIC is what is usually called the **CASH ROIC**, by adding depreciation (the main non-cash cost) to NOPLAT and using gross non-current assets in the invested capital (excluding, though, accumulated depreciation). The main goal is to provide a return measurement of cash generation.

Now, focusing on the shareholders return we have the third ratio, **ROE – Return on Equity:**

$$ROE = \frac{NET\ INCOME}{EQUITY}$$

It is important to point out that this ratio doesn't compute the return obtained by the shareholders, but instead the return of the money invested by the shareholders in the firm. In fact, the accounting value of equity is mainly the sum of two parts: the capital increases and the retained earnings, the latter being funds that the shareholders decided not to receive as dividends to be reinvested in the company. In this sense the ROE represents the return generated by the shareholders funds placed (directly, through capital increases or indirectly, through retained earnings) in the company.

If the goal was to measure the return of the shareholders, itself, the indicator will be **TSR – Total Shareholder Return:**

$$TSR = \frac{CHANGE\ IN\ THE\ VALUE\ OF\ EQUITY\ IN\ THE\ PERIOD + DIVIDENDS}{VALUE\ OF\ EQUITY\ AT\ THE\ START\ OF\ THE\ PERIOD}$$

Typically, this method is mainly used for listed companies, as the change of the value of equity is given by the variation of the price of the shares in the market. In non-listed companies although we can always know the price at which the investor bought the shares of the company, is more difficulty to assess regularly its value, until the investor sell them.

3. Decoupling of ratios

Any of previously ratios can be decoupled in two or more ratios, in order to extract more information regarding the value and evolution of the indicator. Just as an example let's use the GROSS ROA:

$$\text{GROSS ROA} = \frac{\text{EBIT}}{\text{ASSETS}} = \frac{\text{EBIT}}{\text{SALES}} \times \frac{\text{SALES}}{\text{ASSETS}}$$

Looking at the formula we can say that the GROSS ROA is simultaneously a function of margin on sales (EBIT/SALES) and the rotation of sales (SALES/ASSETS). For instance, a retail chain will likely have a small margin on sales and a high rotation while a luxury brand chain will probably show the opposite trend.

This type of analysis can use a lot of different indicators (providing they illustrate some meaningful relationship) and it contributes for a better understanding of the drivers of a given indicator of profitability, allowing also a more detailed comparison with rivals and across time.

4. The concept of financial gearing

The choice between equity and debt or, by other words, the definition of the capital structure, impacts in several areas such as the risk profile of the company and, consequently the cost of funding, the gathering of resources to back up the firm's future development and the timely response to opportunities, challenges and threats that a dynamic environment produces.

Looking at the relationship between debt and profitability there is straightforward and simplified concept that can be analyzed: financial gearing (leverage). This simple concept, much more based in accounting values rather than in market values links the impact of the capital structure in the Return on equity (ROE = Net Income/Equity).

The key message may be viewed in the following expression of ROE:

$$ROE = (GROSS\ ROA + (GROSS\ ROA - r_D) \times \frac{D}{E}) \times (1 - t)$$

Being:

Gross ROA – EBIT/ASSETS

r_D – Average cost of debt

D/E – Debt/Equity

t – Corporate tax rate

Looking at the formula we see that if GROSS ROA is higher than the cost of debt, more debt and less equity (increasing the D/E ratio) will increase the ROE of the firm, an effect usually called financial gearing (or leverage).

This simplified concept assumes two things:

- The cost of debt will not change with the increase of debt;
- Shareholders will be pleased with the nominal increase of ROE.

These assumptions are both related with the perception of risk. But, if the company significantly increases its level of debt, changing though its risk profile, creditors will demand a higher interest rate and investors will require a higher return (that, eventually, will represent an increase larger than the growth of the ROE). Consequently, the financial gearing may be a useful concept for small changes in the firm's capital structure, but it is not a general framework to model it.

5. Economic Value Added (EVA)

A more sophisticated stage of this analysis is driven by the well-known concept of cost of capital (WACC). A company is using well its assets (and the resources made available by shareholders and creditors) if ROIC is above WACC.

The difference between ROIC and WACC, in absolute terms, is the essence of the concept of EVA:

$$\text{EVA} = (\text{ROIC} - \text{WACC}) \times \text{INVESTED CAPITAL}$$

Or

$$\text{EVA} = \text{NOPLAT} - \text{WACC} \times \text{INVESTED CAPITAL}$$

The firm is creating value if it generates enough profit to fully repay the return demanded by shareholders and creditors and still obtains a surplus (the EVA). In another vision, a firm with a non-negative EVA is a firm where the resources are being efficiently allocated.

It is also common to analyze the same concept on a percentage basis, that is, the difference between ROIC and WACC. In this case, we will get an EVA also on a percentage basis.

In the computation of all these indicators at least two related questions may arise. The first is the choice, while computing the invested capital (or capital employed), of book values instead of market values. The justification lies in the fact that we want to measure the return on what was needed for the company carrying out its business and not the value of the company. For instance, equity book value measures what was directly invested in the company by the shareholders (capital) plus indirectly (retained earnings) which is naturally different of what is the firm's value. The second question is a similar one but now addressed to the computation of WACC. There is an ongoing debate if we should, again, use book or market values in the definition of the weight of debt and equity in the formula. There are valid arguments for both alternatives: if we use book values we can say that we are being coherent with what we did in computing the invested capital (capital employed). Using market values, we can say that we want to reflect in the value creation/destruction analysis the real capital structure of the company and its real cost (using book values, the value of equity tends to be smaller, reducing though the WACC).

II. FINANCIAL ANALYSIS

1. Introduction

The financial analysis of a company focus on two main areas: (1) the evaluation of the capital structure of the firm and its adequacy with the nature and characteristics of the assets of the firm and (2) the ability of the firm to timely pay its future commitments.

2. The capital structure analysis and the role of working capital

An initial and simple analysis of the capital structure may be focused in the balance between the two main sources of funds: equity (capital plus past retained earnings) and debt. It is useful so see how the company is overall financed:

$$\text{Financial autonomy} = \frac{EQUITY}{EQUITY + NET DEBT(a)}$$

(a) – Net debt in the sense of Debt minus available cash

Often this ratio is used to establish requirements for access to certain type of funds (for instance, public funds), as it defines in a simple way how much the company is levered.

Another level of analysis is looking at the maturity of the funds and liquidity of assets. In a simple perspective the company will be more financially sustained if there is a match between the maturity of funds and the liquidity of the assets financed by those funds.

From an accounting point of view, we can use the concept of current and non-current assets and liabilities that, essentially, are differentiated by a one-year time frame. In this perspective a more solid financial structure would advise that non-current assets will be financed by non-current debt (and equity).

In this type of equilibrium the concept of working capital (WC) plays a critical role that cannot be ignored.

The concept of working capital (WC)

If we look to any balance sheet we can see that some items in the current assets and liabilities are directly driven by the business of the company, such as accounts receivable and payable and inventories. From an accounting point of view, they are well placed in the balance sheet as they are short term items. Accounts receivable, for instance, represent the credit given to our customers, reflecting the amount of time given for them to pay their purchases, usually ranging up to a couple of months.

But if we analyze these items from a financial perspective and assuming that our business is a renewable cycle of purchases (and production), storage and sales, these items are in the balance sheet on a permanent basis. By other words, if we print every day an updated balance sheet, we will see there an amount of accounts receivable, because every day, at the same time that clients are paying past sales, new sales are made and new credit is given to clients. If we have a regular and constant flow of sales and the payment conditions don't change, for instance 1 month to pay the invoice, whenever we look at the balance sheet we will find there, in the accounts receivable item, one month of sales to receive from our clients. We could do a similar analysis regarding inventory or accounts payable, for example, items which, from an accounting perspective have a short term life but that, in fact, are permanently presented in the balance sheet.

Therefore and from a financial perspective, companies need to finance, on a permanent basis some current assets driven by their activity and, at the same time, they can use resources generated by the business, especially the credit given by their suppliers. In fact, a credit given to a client is money that is not entering now (it will enter only in a future date). That's why companies need to finance current assets. By the same line of reasoning, a credit received from suppliers is money that does not exit the company now, and thus, it is money that can be used for other purposes.

To understand more deeply this relationship between the working capital and the associated need of funds to finance it, let's assume a very simple example, of a commercial company that is starting its business, selling every month 1,000 euros (12,000 per year) and giving to its customers 3 months to pay the product. The product is purchased by the company at the same price (zero margin) and the supplier gives a one month credit to pay each invoice. In order to timely respond to customer orders, the company needs to have an inventory representing one month of sales. Let's also assume that there aren't any other operating costs.

In the table below we present the monthly inflows and outflows of the company:

Table 1: monthly operational inflows and outflows

MONTHS	1	2	3	4
Inflows from sales				1,000 ⁽²⁾
Outflows to suppliers	(1,000) ⁽¹⁾	(1,000)	(1,000)	(1,000)
Balance at end of period	(1,000)	(1,000)	(1,000)	0
Accumulated balance	(1,000)	(2,000)	(3,000)	(3,000)

Notes:

- (1) – The company needs to have an inventory of one month of sales. Therefore one month before starting its activity it will buy 1,000 and it will pay it in month 1 (one month of credit from suppliers). This inventory is needed every month, since the company also sells 1,000 each month. And so the company has a monthly credit of 1,000 from suppliers.
- (2) - If the company gives 3 months of credit to its customers, sales from month 1 will be received in month 4.

The accumulated deficit of 3,000 will be maintained in the next months (unless there is a change in the collection period of clients and suppliers). It represents the WC of the company that has to be financed to avoid any disruption in operational activity. This value of 3,000 could be alternatively computed in terms of the balance sheet items. In the **cruise stage** the permanent amount of accounts

receivable will be 3,000 (three months of sales or $12,000/12*3$) and the amount of inventory 1,000 (one month of sales or $12,000/12*1$), a permanent immobilization of funds of 4,000. On the other hand the company can obtain a permanent credit from suppliers (accounts payable) of 1,000 and, therefore, a WC of 3,000.

In some industries the WC may be negative, that is, the resources generated by the business surpass the immobilization of funds needed (a retailing chain may sell mainly in cash, have a high inventory turnover and, due to its bargaining power, obtain generous payment conditions from its suppliers). In these cases WC works as source of permanent funds available to finance other assets.

But in the more frequent situations in which WC is positive, companies should be aware of its financial importance, especially in two situations:

- Every time the firm is considering decisions that may impact in the level of any item of the WC (for instance the increase of the credit limit or time to pay given to customers in order to push sales), it is important to evaluate its financial impact and if the company has the ability to match the additional immobilization of funds (remember that a higher credit to customers is the same as delaying cash inflows); in addition this increased need of funds has a cost that must be considered while analyzing the benefits of a change in some parameters of the business;
- Processes of significant business growth (typically in the early years of startups), which may bring along also huge increases in WC. The company should be prepared to finance them, otherwise, what could have been a stage of economic growth and performance may end up in a financial collapse due to the scarcity of available funds.

For the purposes of calculation of Working Capital, it should be noted that:

- Typically, Clients are determined as a function of Sales and time (months of credit given to clients), as follows: $(\text{Sales incl. VAT})/12*\text{months of credit}$

- Inventories are determined as a function of COGS and time (inventory turnover), as follows: $\text{COGS}/12 \times \text{months of inventory}$
- Suppliers are usually determined as a function of operating costs (excluding staff costs, which are always paid when due) and time (credit obtained from suppliers), as follows: $(\text{Purchases inc. VAT} + \text{Costs inc. VAT})/12 \times \text{months of credit from suppliers}$.
- VAT is determined as a function of net VAT (to be paid or to be collected, depending on the amount of sales and costs) and time as follows: $(\text{VAT paid} - \text{VAT received})/12 \times \text{months of credit}$.
- The above formulas express values on a monthly basis, but other time measures can be used, namely days, in which case one divides by 360 (instead of 12) and multiplies by time expressed in days.

Having analyzed the concept of working capital and being understood that it represents a permanent application of funds (if positive) or source of funds (if negative), we can review the equilibrium statement presenting it as an equality:

$$\text{Non-current assets} + \text{WC} = \text{Non-current debt} + \text{Equity}$$

It is important to notice that a company may not follow this equality as a consequence of a deliberated financial strategy.

It may have a value of non-current assets plus WC lower than the sum of non-current debt and equity to reinforce its financial strength (a conservative approach). By contrast, it may present the opposite situation as a result of pursuing greater financial flexibility (for instance, replacing long term debt by short term debt, allowing an easier adjustment of amounts and maturities) and/or as a tentative to lower the cost of funds (using the same example, short term debt tends to be less costly than long term debt). The downside of this type of strategy is the increase of risk, especially in more adverse scenarios, with a less level of stability in the source of funds.

WC and cash flow generation

The concept of working capital also plays an important role in conciliating the difference between economic flows (revenues minus cash costs) and financial flows (receipts minus payments) of a business. For instance, let's look at sales of a given period. In the same period proceeds from sales will be a function of the last period's accounts receivable amount (credit given to customers) that will be received this period minus the accounts receivable of this period (sales that will be only received next period). **Therefore, the translation of sales of a given period into cash is done by adjusting the variation of the accounts receivable to sales.** More generally, the computation of the amount of cash generated by operations is given by:

Operating Cash Flow = EBITDA - Δ WC (where Δ WC is equal to WC_{n+1} minus WC_n).

In a stable situation, WC also tends to be stable (its main driver is the level of activity) and therefore EBITDA tends to produce a similar amount of cash. However, if the level of activity increases, until it reaches a smoothing phase, the operating cash flow can be dramatically reduced by the changes in the WC and the company should be aware of this constraint in its financial planning.

3. Linking debt and cash generation

The main goal of this type of analysis is confronting the level of debt of the company with its capacity of cash generation from its business, attempting to evaluate the long term sustainability of the current level of debt.

There are several ratios than can be used to analyze this relationship. Below there is a list of the more well-known:

NET DEBT/EBITDA

NET DEBT/FUNDS FROM OPERATIONS (FFO)

Both ratios relate the net level of debt with the capacity of cash generation from operations. The concept of FFO is somewhat a refinement of EBITDA, as it deducts from EBITDA corporate taxes associated with the business income and explicitly eliminates from EBITDA all non-cash items.

EBITDA/NET INTEREST

FFO/NET INTEREST

It relates the cash generation from operations to the amount of interest inherent to the net debt of the company.

The analysis of these ratios is useful in terms of the evolution of the company, in the comparison with competitors and industry averages and against benchmarks established by monitoring entities (for instance the rating agencies clearly establish thresholds that should be followed in several key financial ratios to achieve a given credit rating).

4. Sustainable growth under current conditions (g rate)

The main idea behind this concept is the identification of the growth power of the company **while maintaining its current economic and financial conditions**.

There are several models, more and less complex, attempting to estimate a "g" rate, taking into account the current economic and financial data of the company.

Probably, the most well-known (and used) model is the simplest version of the Higgings Model:

HIGGINGS MODEL

$$g = \text{ROE} \times (1 - \text{PAYOUT RATIO})$$

This model assumes the stability of the company's financial policy, that is, the maintenance of D/E ratio and no capital increases. The only source of growth for equity will be retained earnings and debt will increase, to match the value of retained earnings, according to the D/E ratio. It is also assumed that the cost of debt will not change.

Two other well-known models are the Van Horne model and the BCG model.

VAN HORNE MODEL

$$g = \frac{(1 - \text{PAYOUT}) \times \frac{\text{EBT}}{\text{TURNOVER}} \times \left(1 + \frac{D}{E}\right)}{\frac{\text{ASSETS}}{\text{TURNOVER}} - \left((1 - \text{PAYOUT}) \times \frac{\text{EBT}}{\text{TURNOVER}} \times \left(1 + \frac{D}{E}\right)\right)}$$

BCG MODEL

$$g = D/E \times (\text{ROA} - \text{ni}) \times (1 - \text{PAYOUT}) + \text{ROA} \times (1 - \text{PAYOUT})$$

Being:

ROA – Net income/assets

ni – interest rate net of taxes (interest x (1 – tax rate)/debt)

In this model, beyond the growth which comes from reinvesting returns, additional growth is also coming from leveraging the company, since part of this additional growth is funded with recourse to debt, which is a cheaper source of capital. This effect is reflected in the difference between ROA and ni. However, this only happens as long as ROA is higher than the cost of debt.

Again, the assumptions behind these models are similar to the Higgins model, although the Van Horne and BCG models attempt to include some degree of variation in the economic conditions of the firm.

Let's perform a simple illustration of these models.

EXAMPLE

TURNOVER (SALES)	100	ASSETS ⁽¹⁾	200
EBIT	36	EQUITY ⁽¹⁾	80
INTEREST (5% DEBT)	6	DEBT ⁽¹⁾	120
EBT	30		
TAXES (20%)	6		
NET INCOME	24		
DIVIDENDS (70% PAYOUT)	16.8		
RETAINED EARNINGS	7.2		

(1) – There is a debate, every time that measures using data from income stamen and balance sheet are employed, regarding the timing of the balance sheet values; some point out that it should be used values from the end of the previous year, others argue that average values (current and last year), should be used instead.

HIGGINGS MODEL

$$g = 24/80 \times (1-0.7) = 0.09(9\%)$$

VAN HORNE MODEL

$$g = \frac{0.3 \times \frac{24}{100} \times (1 + \frac{120}{80})}{\frac{200}{100} - 0.3 \times \frac{24}{100} \times (1 + \frac{120}{80})} = 0.099(9.9\%)$$

BCG MODEL

$$g = \frac{120}{80} \times (\frac{24}{200} - (0.05 \times (1 - 0.2) \times (1 - 0.7))) + \frac{24}{200} \times (1 - 0.7) = 0.072(7.2\%)$$

Regardless of the difference among the g of three models, they are a useful tool to give a rough benchmark of the growth power of the firm under the current economic and financial conditions.

Any goal of growth clearly beyond that figure should require a careful analysis and evaluation of the financial implications for the firm, in order to avoid unpleasant surprises in its financial equilibrium.