

## VALUATION OF COMPANIES NOT QUOTED ON THE STOCK MARKET

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### ABSTRACT:

Valuation of companies not quoted on the stock market, and of relatively small size, have not been studied (evaluated) as compared with other large and quoted ones.

In the present study, and as starting point, we apply the traditional “CVA – Cash Value Added” method particularly adequate for the type of Portuguese (small) firms. We proceed by performing a sensitivity and simulation (“dynamic”) analysis, in order to estimate the associated risk and compare the results with the previous classic (static) valuation methodology.

This, in our opinion, is another contribution of this research.

**KEYWORDS:** Valuation of Firms; Traditional (static) CVA; Firms not Quoted on the Stock

Market; Small Firms; Simulation Analysis; Risk

## VALUATION OF COMPANIES NOT QUOTED ON THE STOCK MARKET

### 1 – Introduction

Rappaport (1998) suggests that, when a company is traded publicly, its market value is (should be) the basis to determine its value, although Rappaport & Mauboussin (2002) call the attention to the fact that (stock) market prices may not always be appropriate. But, in the absence of a market, non quoted companies can to be valued by using some adequate valuation methods.

In this study, we briefly review the literature on the topic, present the adopted valuation methodology and the respective results. At the end, we will outline the main conclusions.

### 2- Literature Review

The various valuation methods may be divided into three major groups: methods based on the revenue (accounting) point of view, methods based on cash flows and dynamic methods.

#### 2.1 - Methods based on the *Patrimony/Income*

These methods use accounting information (e.g.: book values; corrected book values; substantive values; net incomes; profitability; goodwill, etc...).

All the above mentioned methods are relatively easy to apply. In spite of that, all of them have limitations that reduce their potential as a tool for valuation purposes. The conservatism “embedded” on the “Accounting Principles Generally Accepted - APGA”, leads to the fact that these methods are not, in general, the most correct ones (Bauman, 1999). In fact, they do not consider important decision variables such as the cost of capital, the risk of the firm and its (future) expectations. Some authors (e.g.: Feltham&Olson, 1996), consider that financial statements, based on historical costs, may provide misleading information. Another criticism/disadvantage of these methods is that, apart from considering the firm as a whole, many of these are prone to “window dressing” and certain accounting practices with the purpose of obtaining short-term results at the expense of long term prospects of the firm. Some authors, like Sreedhararam & Sooria (2002), consider that one of the important

challenges of accounting is to eliminate (or reduce) the difference between the value provided by the balance sheet and that provided when using market values.

In spite of these limitations, all of these methods have, at least, some informative power, which may be, to a certain extent, useful for some companies.

Finally, when buying a firm, one should take into consideration, not only what the firm is today, but also its future prospects. We may argue that it makes no sense to estimate their value using static historical models (such as those previously mentioned), because any firm's value comes from its potential to create wealth in the future.

The methods described below overcome, to a large extent, this limitation.

### *2.3 - Cash flow based methods*

These methods are, generally speaking, based on the premise that the value of a firm depends on its capability of generating future cash-flows.

The following main subcategories of methods are: the Price Cash Flow; the Present Certainty Equivalent - PCE; the Shareholder Value Added - SVA; the Economic Value Added - EVA; the Market Value Added - MVA and the Cash Value Added - CVA.

In general, all these methods have common characteristics: Virtually all of them are based on the assumption that firms should not look only at accounting profits (which are prone to distortions), but should take into account the return that exceeds the cost of capital.

Struck et al (2001) considers, for example, that the CVA is equivalent to the EVA with the exception that they use different concepts. Nevertheless, the EVA and the CVA methods indicate how firms are contributing to the increase of the firm's value for the shareholders and what capital should be invested (although, and again, their approaches are different). The main differences in the two methods lie on the way how EVA measures operational results, whereas the CVA is a measure of efficiency which compares the (future) cash flows with the total assets that generate them. The CVA method, at least theoretically, corrects the accounting distortions which are present in the EVA. Also, a firm creates value only when it increases the expected growth rate of the cash flows and reduces the weighted average cost of Capital - WACC (Damodaran, 1998; Copeland, 2002).

But, the respective measures are not easy to determine apart from the fact that, somehow, they tend to ignore factors of qualitative nature, such as: the quality of management, the trademark, strategic decisions and the marketing policy of the firm, for example.

Nevertheless, and in our opinion, the CVA method takes into account several factors in particular, considers economical as well as financial aspects of the firm. On the contrary, the EVA method, considers only the economical aspect of it.

### *2.3 - Dynamic models*

The previously described valuation methods assume that firm's assets are managed "passively". By means of the real options approach, managers are "allowed" to take decisions and, consequently, considering their impact on the value of the firm.

As it is well known, real options methods allow us to evaluate the operational flexibility and strategic options "embedded" in most projects as opposed, for example, to the "rigid" NPV and IRR methodologies. However, in certain circumstances/situations, there are practical problems that restrict (or makes it very difficult) to use real options models, for example in relation to the type of Portuguese firms which are the object of valuation in this research: they are relatively small, with lack of relevant and necessary information for that purpose.

Having in mind all the advantages and the drawbacks, we have chosen, as a starting point, to apply the standard CVA method for its relative simplicity and because, in our view, it is the most appropriate for the valuation of the type of firms under study (as it will be described both in sections 4.1 and 4.2).

### **3 - Methodology**

As it has been previously mentioned, at least theoretically, the value of any firm (or investment) depends on the future benefits that it is expected to generate. As a starting point, we will follow the methodology of Koussinidis et al (2000) and will predict the values of all items in relation to the financial statements of all firms, in particular those which will enable us to predict their CVA's.

In order to deal with the well known (and potential) problem related with the use of (accounting) information from the type firms used in this research, as well as with the

information that has to be obtained from other databases, which are composed, to a large extent, by relatively large firms (e. g.: research departments of Banks, and similar ones)<sup>1</sup>, we believe that we have mitigated these limitations, for example, using average values of the sector and of the firms in our research to which they belong<sup>2</sup>.

### 3.1- Definition of the variables and brief description of the methodology

#### 3.1.1 – The “Static” CVA

The CVA is a measure of efficiency that compares the expected net cash flows with the total amount of assets that generate these cash flows. We begin by forecasting sales, from which we predict all the other items, also considering (as we have previously said) the sector average values and those from the firms under study. Also, we are going to work at constant instead of current prices.

So, in such a context, the CVA may be expressed as follows:

$$CVA_t = OR_t + D_t - ED_t - 1 \cdot WACC_t \quad (3.1)$$

$$ED_t = \frac{11 \cdot WACC_t}{(1 + WACC_t)^n - 1} \quad (3.2)$$

where:

- $OR_t$  is the net operational result of the year  $t$
- $D_t$  is the depreciation in relation to the year  $t$
- $ED_t$  is the economic depreciation for year  $t$
- 11 is the initial investment
- $n$  is the useful life of the fixed assets;
- $WACC_t$  - weighted average cost of capital relative to year  $t$

<sup>1</sup> See, for example, Staincz (2000)

<sup>2</sup> Of course, and to the best of our knowledge/possibilities, we also checked all the financial statements used in this research and in relation to all firms.

The economical depreciation represents the annuity that, when capitalized at the cost of capital ( $WACC_t$ ), gives the value of the assets at the end of its economic life. According to the BEG (1996), this is the annual estimated economic cost of the investment.

We used (and analyzed) the balance sheets as well as other financial statements of the firms for the years between 1997 and 2001.

#### 3.1.1.1 – Sales Growth

In this section, we followed Lamont&Palk's (2001) methodology in order to estimate the sales growth rate by regressing their historical values for the firms with those for the sector.<sup>3</sup>

The sales growth rate was estimated under the assumption that the firms do not reinvest because they have not and, in fact, it is expected not to achieve their limit of production capacity.

#### 3.1.1.2 - Cost of Equity (Ks)

For the firms under study, the cost of equity was considered to be 1.11 % based on the indicators from the “Central de Balanços” BPA<sup>4</sup> between 1996 and 1999.

#### 3.1.1.3 - The cost of Debt (Kd)

The cost of debt was estimated as follows:

$$Kd = \frac{\text{Interest}}{\text{Debt}} \quad (3.3)$$

Debt, as it is well known, allows fiscal incentives.

#### 3.1.1.4 – Weighted Average Cost of Capital (WACC)

<sup>3</sup> It is also noteworthy that, in so doing, we did not consider the periods of “expansion” and “recession” of the firms (Dierman&Berry, 1995)

<sup>4</sup> BPA – Banco Português do Atlântico

The weights, in general, should be market weights and not accounting ones. However, since this study is concerned with non quoted and small firms, we used accounting weights (Lamon&Polk, 2001).

So, the WACC can be estimated as follows:

$$WACC_t = \left( \frac{D_t}{V_t} \right) \cdot K_d \cdot (1-T) + \left( \frac{S_t}{V_t} \right) \cdot K_s \quad (3.4)$$

where:

- $D_t$  represents the debt at time  $t$ ;
- $V_t$  is the total value of the asset at time  $t$ ;
- $K_d$  is the cost of debt;
- $T$  is the tax rate;
- $S_t$  is the amount of equity;
- $t$  represents the time period;
- $K_s$  is the cost of equity

We assume that the respective tax rate remains constant during the period of analysis <sup>5</sup>.

### 3.1.1.5 – Terminal (Residual) Value

It is the value of the firm at the end of the time horizon for evaluation purposes which, obviously, has to be discounted for the moment of the valuation (moment "zero").

We assumed, as it is common, that the firm's cash-flow beyond 2006, will be equal and perpetual. So, the residual value, is obtained from:

$$VR_z = M \cdot CVA_z \quad (3.5)$$

where the capitalization coefficient  $M$  is given by:

<sup>5</sup> Of course, and for example, via sensitivity and/or simulation analysis, this can be "easily" handled.

$$M = \left[ \frac{1}{WACC_z} \right] \quad (3.6)$$

being:

- $VR_z$ , the residual value in the last year for which the predictions are made (2006);
- $CVA_z$ , the "Cash Value Added" in year  $z$  (which is assumed constant and perpetual);
- $z$ , the last year for which the predictions are made;
- $M$  is the value, at time  $z$ , of a perpetual annuity, with the terms equal to unity.

### 3.1.1.6 – Invested capital

In order to estimate the invested capital, we used the data provided by the balance sheet of the firms as well from the depreciation maps of 2001.

### 3.2 – Risk analysis (The "Dynamic" CVA)

Even though "risk" and "uncertainty" have not the same meaning, we will use both indifferently.

In order to determine the critical variables (via sensitivity analysis), we considered, for each variable, a set of intervals with an amplitude increasing with time. Those (critical) variables will play an important role as far as the simulation analysis is concerned and performed afterwards.

## 4 – Data description and discussion of the results

### 4.1 - Data description

To carry out the empirical study, we selected some firms in accordance with the following criteria:

- firms should be active since 1997 (inclusive). This is due to the need of having enough (accounting) information (at least 5 years) for estimating the sales growth rate.

- small firms belonging to the olive oil sector, which is a very important one for Portugal

In order to keep the information anonymous, at the request of the firms, a code (E1, E2 and E3) was created. One of them is run by the family and the other two (cooperatives) are managed by a board of directors that is appointed by the general assembly for a typical time of 3 years. All of these firms have benefited from the EU funds and the investments were made in order comply with EU environmental norms<sup>6</sup>.

Obviously, and as a starting point, certain (we believe) reasonable assumptions were made, as follows:

- A tax rate of 25% for the so-called family-firm and of 20% for the cooperatives were taken into account, due to the fact that they are located in a zone of Portugal which is considered "priority";
- The firms do not pay dividends in the period between 2002 and 2006;
- The predictions took into account their historical records as well as the characteristics of the sector where the companies belong. The experience of the owners as well as of the authors, as to the sector and to the economy, were also considered;
- All the predictions were made at constant prices;
- It is expected that there will not be new investments within the time horizon for evaluation purposes, as well as in terms of "social capital".

#### 4.2 – Analysis of the results

<sup>6</sup> This has forced the companies to abandon the 3 phase process of production and adopt a continuous 2 phase process with less environmental impact.

As an example, we apply the methodology to firm E1 only and present the final results in relation to all of them in Table 4.5<sup>7</sup>.

Table 4.1 – The Expected Value of Firm E1

	ESTIMATION OF THE CVAs and VALUE					Unit: Euros
	Years					
	2002	2003	2004	2005	2006	
1. Sales	2.089.862	2.147.987	2.206.111	2.264.236	2.322.360	
2. External Services	0	0	0	0	0	
3. Inventory Change	0	0	0	0	0	
<b>4. Total Operational Revenues</b>	<b>2.089.862</b>	<b>2.147.987</b>	<b>2.206.111</b>	<b>2.264.236</b>	<b>2.322.360</b>	
5. Costs of Good sold	1.763.635	1.812.686	1.861.737	1.910.788	1.959.840	
6. Administration Costs	97.880	100.602	103.324	106.047	108.769	
7. Labour Costs	77.453	79.607	81.761	83.915	86.070	
8. Depreciation	85.468	76.638	75.784	70.062	69.443	
9. Other Provisions	0	0	0	0	0	
10. Other Operational Costs	8.359	8.592	8.824	9.057	9.289	
<b>11. Total Operational Costs</b>	<b>2.032.795</b>	<b>2.078.125</b>	<b>2.131.432</b>	<b>2.179.869</b>	<b>2.233.411</b>	
12. Operating Results	45.654	55.889	59.744	67.493	71.159	
13. Depreciation	85.468	76.638	75.784	70.062	69.443	
14. Economic Depreciation	42.816	42.681	38.225	38.507	35.191	
15. Initial Investment	4.047.418	4.047.418	4.047.418	4.047.418	4.047.418	
16. WACC	2.209%	2.139%	2.079%	2.019%	1.989%	
17. CVAs	-669	3.463	13.324	17.723	25.132	
18. Present Value of CVAs	54.341					
19. Terminal Value in 2006	1.267.097					
20. Terminal Value in 2002	1.143.157					
21. Value of the Firm	1.197.498					

In order to estimate the sales growth rate (the intermediate tables can also be requested from the authors) for the period of 2002 - 2006, we used historical data of the firm as well as that of the sector and used regression analysis. Then, we estimated the cost structure and, in the end, the various CVAs and the expected value. This structure was computed based on the average costs between those of the firm and of the sector. This procedure aimed at adjusting the firms' data "closer" to that of the sector (although they present similar costs structures, anyway).

<sup>7</sup> Upon request, the authors are glad to provide all the results in relation to firms E2 and E3.

Having estimated all the variables required by the model, we computed the CVA's for each year, and discounted them, at the respective WACC, to the beginning of the evaluation period.

The previously estimated value for the firm EI (see Table 4.1 above), can be seen as a "classic" value which does not reflect the risk being taken. To be able to estimate the associated risk, we will perform now a sensitivity analysis followed by the use of simulation, taking the traditional CVA methodology as the basis for applying those procedures.

We determined the intervals for each variable (see Table 4.2 below), based on information obtained from a questionnaire sent to the "investors" and also from our own experience as to these type of firms, sector, as well as the economic perspectives of the country. The amplitude of these intervals increases with time. Also, it is important to point out that, to perform this kind of analysis, we kept the same degree of confidence (say: 95%) for all the intervals, independently of their amplitude and for all the variables. This procedure enables a consistent comparison of the differences in Table 4.3 below.

**Table 4.2 – The variables and the respective intervals.**

Variables	Years				
	2002	2003	2004	2005	2006
Sales	5%	10%	15%	20%	25%
Gross Margin	4%	8%	12%	16%	20%
Administration Costs	3%	6%	9%	12%	15%
Labour Costs	2%	4%	6%	8%	10%
Other Operational Costs	3%	6%	9%	12%	15%

In order to determine the values shown in Table 4.3 below, we also considered the most important interdependencies between the variables, again based on our experience and also on our knowledge on this type of firms as well as their sector. Having determined the value of the firm for different variables, we concluded that firm EI is very sensitive, in particular, to variations on the sales growth rate and to the gross margin.

**Table 4.3 – Results of the Sensitivity analysis for Firm EI.**

Variable	Pessimistic Value (PV)	Optimistic Value (OV)	Differences OV - PV	Standard Deviation
Sales	-2.209.417 €	7.067.496 €	9.276.914 €	4.799.164 €
Gross Margin	-1.614.603 €	4.078.916 €	5.693.519 €	2.846.970 €
Administration Costs	539.917 €	1.838.267 €	1.278.350 €	639.177 €
Labour Costs	860.753 €	1.535.133 €	674.380 €	337.190 €
Other Operational Costs	1.142.921 €	1.252.099 €	109.178 €	54.589 €

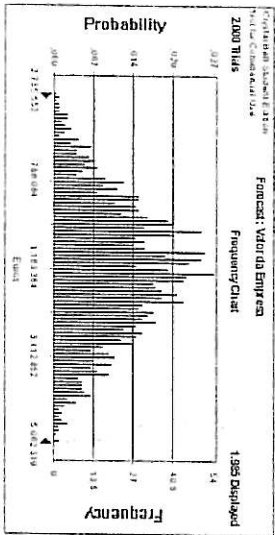
The analysis just made allows us to, consistently, determine which are the critical variables for the valuation of the firms. Obviously, this kind of analysis does not "picture" completely the risk. Although it is important to recognize these facts, since there is a wide variation as the possible CVA's, it is necessary to consider a higher number of other possible scenarios.

In this context, we have decided to perform a simulation analysis, considering the growth rate of sales and the gross margin as critical variables according to the information provided by the sensitivity analysis. All the others were kept at the values obtained by the classical analysis, since they were considered as non-critical variables.

From the values obtained, (see Figure 4.1), it is possible to conclude that the expected (average) value of the firm EI is 1.205.618€, with a relatively high standard deviation

Graph 4.1 – Simulation: Summary statistics.

Forecast: Value of the Business	
Statistics:	Value
Trials	2000
Mean	1.205.618
Median	1.210.736
Mode	---
Standard Deviation	1.496.142
Variance	2E+12
Skewness	0,04
Kurtosis	2,98
Coeff. of Variability	1,24
Range Minimum	-4.173.391
Range Maximum	6.469.020
Range Width	10.642.412
Mean Std. Error	33.454,75



Analyzing Table 4.4 below, we conclude that there is a probability of 50% of the value of the firm to be less than 1.210.736€, slightly smaller than the value of 1.197.498€ given by the so-called static analysis. According to the predictions, there is a very small probability for that value to be larger than 6.469.020€ and smaller than -4.173.391€. However, there is a probability of more than 20% of a negative value.

Table 4.4 – Some possible values of the firm and the respective percentile.

Percentile	Firm's
0 <sup>th</sup> %	-4.173.391
10 <sup>th</sup> %	-710.259
20 <sup>th</sup> %	-56.117
30 <sup>th</sup> %	376.613
40 <sup>th</sup> %	828.059
50 <sup>th</sup> %	1.210.736
60 <sup>th</sup> %	1.584.537
70 <sup>th</sup> %	1.981.581
80 <sup>th</sup> %	2.473.659
90 <sup>th</sup> %	3.164.399
100 <sup>th</sup> %	6.469.020

As it can be seen by the "static" (traditional) CVA analysis, the value of the firm E1 is 1.197.498€. Through a "dynamic" analysis, we can also see that the expected (average) value is 1.205.618€. However (and this is very important for several reasons), in terms of possible negotiation, and consequent definition of the final price, the value obtained by the "dynamic" analysis is, obviously, very much important, as it shows that the value of the firm can vary between -4.173.391€ and 6.469.020€. This allows an eventual buyer/seller to have a better set of information for setting the final price. Through the "classical" CVA analysis it is impossible to have this perspective.

Table 4.5 below presents a summary of the valuation of all firms.

Table 4.5 – Value of all the firms.

	Firms		
	E1	E2	E3
Static value of the Firms	1.197.498 €	4.130.085 €	3.306.296 €
"Dynamic" value of the Firms	1.205.618 €	4.218.613 €	3.322.673 €
Risk of evaluation	1.496.142 €	1.242.048 €	566.115 €
Equity	1.523.220 €	264.615 €	435.571 €

It is possible to see that, although all firms present "dynamic" values relatively close to the "static" ones, however, via the "dynamic" analysis one obtains a set of other values/indicators/ranges which will allow us to make less risky (at least, in principle)

decisions. This is why to compute the CVA<sup>8</sup> by the classical ("static") approach is not the most adequate or even sufficient for the purpose of concern.

## 5 – Conclusions:

In this research, we began by presenting various methods of firms' valuation (section 2) and briefly discussed each of them. A special discussion was made about the one (the CVA method) that seemed to be more adequate to value the small firms considered in our research and also not quoted on the stock market, in relation to which very little work has been done.

The implementation of the methodology was described in Section 3.

In section 4 we presented the firms that were object of valuation. The collected information was based on accounting documents provided by the firms, as well as from the "Central de Balancos" of BPA (Banco Português do Atlântico).

In our research, we found two important (and possible) values for the firms under study. One of them is called the traditional (or "static") value and the other the "dynamic" one. Both values are computed based on the sum of the discounted CVA's plus the, also discounted, residual value. The "static" valuation gives only a possible value, while the so-called "dynamic" valuation gives a spectrum of possible values which allows us to have a more accurate picture of the firm's value, as well as of the associated risk. This allows an eventual buyer/seller to have a better set of information for deciding the final value of the deal.

We also concluded that the variables to which the value of the companies is more sensitive are the growth of sales and the gross margin. The authors Rappaport e Mauboussin (2002) concluded the same, considering the variables growth of sales, operational results, and investment costs as essential variables for the prediction of the firms growth.

Moreover, the "average" obtained by simulation, compared with the equity capital of the firms, allows us to conclude that only firm E1 presents its equity capital higher than the so-called "dynamic" value, being that one smaller as compared to that of the other firms. These results may have some relationship to the creation of value for the stakeholders, independently of their legal structure, as well as to the existing relationship between the realized investment and the sales obtained by the firm, since firm E1 is the only one which presents the largest relationship between the realized investment and its sales.

Finally, we also concluded that the CVA method and the "extended and dynamic" methodology based upon it, not only allows the valuation of small and non quoted firms, but also can be a measure of creation of value for the stakeholders, by comparison with their equity.

As a possible future research one may try the valuation of these type of firms through Real Option Theory.

<sup>8</sup> As proposed by the Boston Consulting Group (BCG).

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