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SOFTWARE SOLUTIONS FOR MEASURING AND FORECASTING THE CASH GENERATING UNIT FLOWS RELATED TO INTANGIBLE ASSETS

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Abstract
In light of the difficulties encountered in assessing the value of the CGU (Cash Generating Unit) and of the cash flows associated with goodwill or other intangible assets of a company and after performing the impairment test as provided by the IAS 36-Intangibile Asset and the forecasts related to it, the aim of this paper is to identify and suggest software instruments that would assist in the measurement and forecasting of these elements.
The employment of the SPSS and the NeuroShell programmes in analyzing and forecasting the changes in CGU and CGU flows has helped compare the results and the ensuing error margins, thus giving the business entity the possibility to select the best software option, depending on certain variables identified on a micro or a macroeconomic level that may affect the depreciation or the increases in value of the underlying assets for CGU or CGU flows.

Keywords: *CGU and CGU flows; IAS/IFRS standards; data series; neural networks; forecasting methods.*

Jel Classification: *M41, M15, C89.*

I. INTRODUCTION

In order to properly grasp the importance of this topic, one must first understand the accounting methods used to highlight and analyse CGU or CGU flows related to the intangible assets of a company, as well as the difficulties met in measuring these elements.

The apparent effect of most assessment methods mainly lies with the fact that they lack experience and practice, thus preventing a comparison between companies, industries or nations.

Economic theorists have progressively granted intangible assets an increasingly prominent role in management and strategic planning processes, regardless of their origin. The importance acquired by intangible resources is also backed by the increasing number of enterprises that choose to run their business systems by relying on the ownership and use of these resources.

IAS 36- *Impairment of Assets* is the main international accounting standard that encompasses the accounting treatment related to the recognition, measurement and presentation of CGU in financial statements, as developed by the International Accounting Standard Board (IASB).

One of the main difficulties dealt with by the IAS 36 standard is the identification of *cash-flow* generating units (CGU); thus, the *impairment test* is adopted as a reference term for specific business units – *cash generating units* or CGU – and not for the whole company or for the entire concern. The use of CGU is essential in the impairment testing of goodwill; actually, goodwill does not generate cash flows independent of other assets or groups of assets.

Starting from the accounting reasoning applied in the analysis of CGU flows, Cappelletto and Toniolllo (2007) emphasize the fact that the risk analysis undergone by a business unit is mainly based on the historical development of balances. The financial statements of the business allow for the identification of a series of economic, financial and equity related information that is absolutely necessary in assessing the economic, financial and equity balance of a company. This economic balance is based on the ratio of the rate of return of the invested capital (return on investment - ROI) to the weighted average cost of capital.

The value of intangible assets must be measured in terms of their ability to generate future economic benefits for the business entity and especially depending on their contribution to the effectiveness of strategic behaviours. The competitive difference between business entities increasingly depends on the interaction

between intangible resources, as well as the competencies that make up the intangible assets of the business entity they belong to, and the opportunities arising in the external environment, an aspect that has been highlighted by numerous professionals, such as: Amaduzzi, (1978); Cassandro (1985); Airoldi & Brunetti (1983); Coda & Brunetti & Bergamin (1973; 1993).

According to the IAS 36 standard, the depreciations or the reductions of the carrying amount related to the goodwill purchased after a business combination must be allocated at the time when a Cash Generating Unit or CGU group is purchased, which is supposed to benefit from the synergies of the consolidation process, independent of other assets or liabilities of the purchased entity or assigned to these units or groups of units.

When goodwill is allocated in this manner, each CGU or groups of CGU must:

- Represent the minimum level goodwill has been identified at within the unit after the management internal control procedures;
- It shouldn't be larger than an operating segment as defined by IFRS 8.

In order to identify the goodwill impairment test level, one must pay special attention to the type of business organisation and to the management and control methods. After identifying the management model, one should also check for the lowest aggregation of assets that would generate the rational recovery of the synergy flows between different groups.

This minimum limit is set by the lowest level at which the internal control system provides management structures with economic and financial information that may assist in the monitoring and management processes. As for the maximum level, it consists in the methods used to segment the business with the purpose of external segment reporting (Istrate, 2008).

The evaluation of a company based on the CGU value it generates has been a highly debated issue that many authors have focused on ever since the first capitalist enterprises were founded. Guatri's (1998) and other researchers, such as Riva (2007) and Massari (1998), believe that there are numerous reasons and criteria that can be used in assessing the value of a business entity, as these methods of measurement have now become widely accepted.

Even in the more traditional company valuation methods, such as asset valuation that would take into account the value of every asset as recorded in the balance sheet, special attention would be given to the value of intangible assets (Brigger, 1989).

Copeland & Koller & Murrin (2002) have rather pragmatically analysed the importance of measuring and assigning the value of a company for its managers and for other categories of stakeholders.

The financial balance in a business entity is no longer such a prominent issue, but it is certainly more present than the issue of economic balance; in other words, the company doesn't necessarily have to reach economic balance in a short period of time, but it has to maintain its financial balance at all times during its lifetime (Gianessi, 1982).

The short term financial balance equation is as follows:

I+Ac=C+R+E (1)

Where: I=fixed asset;
Ac=circulating asset;
R=rate of return;
C=shareholders' equity;
E=liabilities**.**

The above formula can lead to the value of the working capital and the structure rate, therefore:

CCN=Ac-E=C+R-I (2)

Rs=C-I (3)

where: CCN=working capital;
Rs=structure rate.

Under financial equilibrium, these indicators should have positive values. As for the length of the time period, the financial equilibrium circumstances are identified by means of the following formula (Amaduzzi, 1986):

$$\sum_{t=t_0}^{t_n}\sum_{i=1}^{z}\left[\frac{f_i * c_i}{v_i}\right]^t = \sum_{t=t_0}^{t_n}\sum_{k=1}^{j} C_k^t \qquad (4)$$

where:
f=input;
c=unit price per input;
v=investment turnover;
C=equity value.

Financial equilibrium results from the balance between a company's own means and the means of third parties; the higher this ration, the more likely is a company to become insolvable and increase its risk exposure.

As for the asset equilibrium of a company, it depends on the proper use of the available capital. As the needs of a company can occur at a lower speed (fixed capital – CF) or at a higher speed (working capital – CC), the asset equilibrium is reached when the CF is completely covered from the company's own resources and from

the refunded capital of third parties; therefore, the working capital should be almost completely covered, or the loan capital should have a very short maturity.

Note that the equilibrium analysis is based on financial and statistical information, such as: the value of the operating profit, calculated as the difference between turnover (CA) and the value of the operating costs ((Pe=CA-Ce), and invested capital (Ci=CF+CG); the asset equilibrium practically compare the degree of endowment to equity and loan capital amounts, calculated at the time when the financial statements are completed; the gearing is thus determined.

The precise calculation of the capitalization rate is essential when forecasting the future value to be generated, as inflation should be taken into account. The basic formulas used in business valuation by means of cash flows rely on the distinction between analytic and synthetic approaches. The two key variables of these approaches are: the future economic benefits recorded during a reference period and estimated for a certain time interval; the value of the capitalization rate that measures the rate of return of the invested capital.

However, returning to the subject of the present paper, note that neither of these methods (asset pricing or discounted cash flow) is entirely adequate in measuring CGU flows. The most appropriate valuation approach for CGU flows is the financial analysis which looks at the cash flows to be generated in the future (Mates et. al 2008).

The IAS/IFRS standards suggest an *asset side* valuation, which is based on the estimated cash flows generated by the operating activities and not an *equity side* structure based on the total value of the total available cash flows (Rogmanoli, 1979; Onesti & Orecchio 1996; Romano, 2004).

The most visible hindrances occur during a discounted cash flow valuation approach, as it relies on the analysis of future revenues. As far as intangible assets are concerned, the valuation method can be summarised as follows:

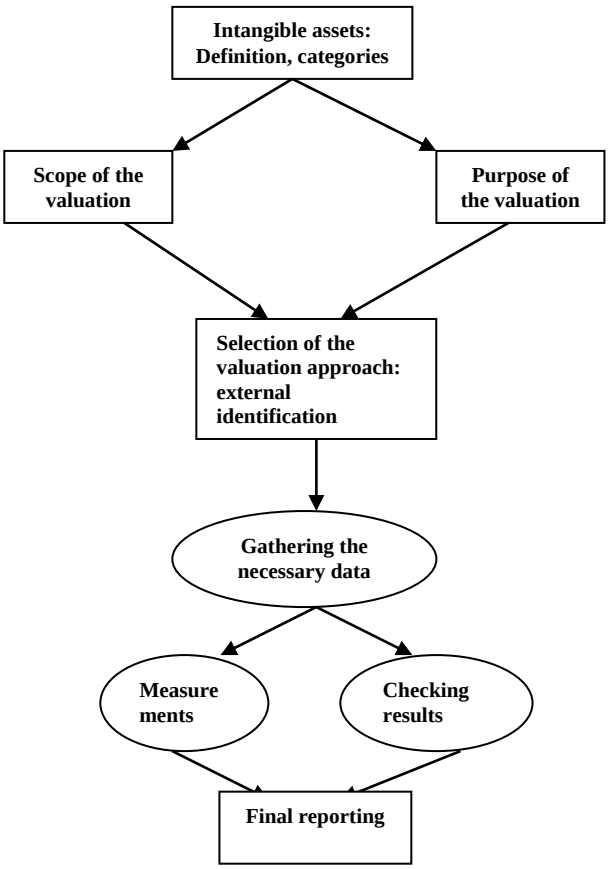


Figure 1: Intangible assets valuation approach: Adapted from Arthur Andersen (1992)

The identification of CGU requires the compliance with certain consistent criteria to be met throughout each accounting period, except for the cases when the alterations are not brought about by the organisational changes imposed by the management of the business entity who accounts for the balance sheet footnotes (OIC, 2007).

According to paragraph no. 10 of IAS 36 – on the identification of CGU to which an asset belongs, the standard maintains the provision that if there is an active market for the output generated by an asset or a group of assets, the asset or the asset flow must be identified as CGU, even if the output is partially or entirely used internally.

According to paragraph 33 of IAS36, the estimates of future cash flows should take into account the value in use, so that the entity can:

a) derive its cash flow estimates from reasonable and supportable assumptions that are the management's best estimates of the set of economic circumstances that will occur over the useful life of the asset;

b) derive its cash flow forecasts from the most recent financial budgets/forecasts approved by the management, without including the future cash outflows or inflows expected to arise from a future restructuring or from an improvement in the asset's performance;

c) derive its cash flow estimates beyond the time interval covered by the most recent budgets/forecasts that use a decreasing or stable growth rate for the following years, except for cases when an increasing growth rate can be justified. This growth rate will not exceed the average long term growth rate of the products, industries, country or countries where the entity is operating or of the asset's specific market, apart from cases when a higher rate can be accounted for (paragraph 33c-IAS 36).

The IAS 36 accounting standard practically requires the recognition of an asset's impairment loss, if its carrying amount seems to exceed its recoverable amount and, therefore, a "permanent impairment" of that asset is not taken into account. During economic crises, such as the current period, the conceptual distinction between "permanent" and "temporary" tends to be diminished (Bostan, Grosu, 2010). Any impairment must be recognised in the profit and loss account and, if it is related to an asset carried at its cost value or, if it refers to an asset that was carried at its historical cost that hadn't been valued in the financial statements prepared in compliance with IAS/IFRS, while being excluded from revaluation, voluntary revaluations are possible, except for IAS 40 investment property according to which the revaluation reserve is not provided and the difference resulting from the conducted revaluations will be carried in the profit and loss account.

II. Recoverable amount and carrying amount of a cash-generating unit

According to paragraph no. 74 of the IAS 36 standard – the recoverable amount of a CGU is the highest of its fair value less costs of disposal and its value in use.

In order to identify the carrying value of a CGU, the criteria to be used will be similar to those employed in determining the recoverable value of a CGU.

In practice, the recoverable value of each activity should be estimated, and if this is not possible, the IAS 36 provides that the entity should determine the recoverable amount of a CGU the asset has been allocated to.

In order to better understand the nature of CGU, one should note that they refer to the smallest identifiable group of assets that generate financial inflows derived from the continuing use of the assets that are largely independent of the financial inflows generated by other assets or groups of assets. If this asset or group of assets is sold on an active market, it should be identified as a separate cash generating unit even if the financial inflows are entirely or partially used for business purposes.

If there is any indication that an asset can suffer permanent impairment, the business entity should consider both the internal and the external sources of information; the former are derived from the market of the product undergoing valuation, the market the entity is active on and from the capital market, but the last two also take into account that particular asset, the physical or moral depreciation, as well as the changes occurring in the organisation, in its operating unit or as a whole.

The IAS 36 provides that the value in use is determined by identifying all the financial inflows and outflows of the entity that generate other units throughout their existence, as well as the subsequent variation of these amounts when the recoverable amount is determined; the discretionary nature of this valuation is apparent in this situation. According to IAS36, these flows should be determined according to certain rational criteria that are backed by the management of the organisation. Thus, the valuation of financial flows, that is often performed by a professional with consistent training in the field of mathematics and statistics, should be based on the most recent budget approved by the management (IAS 36, paragraph no. 33, lett. a).

Future cash flows and the discount rate

The management of the organisation is usually the one that measures and assesses the reliability of the information used in the cash flow forecasts, by examining the causes of the differences between the past cash flow projections and the actual cash flows (parag. 34-IAS 38).

The estimates of future cash flows should not include the cash inflows or outflows from financing activities or income tax receipts or payments.

Future cash flows should reflect patterns that are compatible with the discount rate criterion; otherwise the effects derived from these hypotheses could be taken into account twice or could be entirely overlooked.

Since the present currency value is the one to be taken into account in the discount rate of the estimated future cash flows, these flows do not include the cash inflows from payments or financing activities. Similarly, the discount rate is conditioned by the total amount of taxation while the value of the future inflows is estimated at the total amount of the tax payments (Bostan et al, 2008).

The valuation of the cash flows received or paid for disposing of an asset at the end of its lifecycle consists in the amount of depreciation the business units expect to receive in a free transaction between two

consenting parties bound by a contract and entirely aware of the contract terms, after deducting the incremental costs (costs of disposal).

The IAS 36 does not provide that the discount rate should amount to a particular value, but it recommends that it should be a rate set before tax. Therefore, when the discount rate is estimated after tax, the criterion is adjusted for a discount rate before tax. A business entity normally uses a discount rate to estimate the value in use of an asset. However, an entity uses distinct discount rates for different future time intervals.

When the assets are grouped in order to valuate the recoverable amount, the CGU must include all the assets that generate the relevant cash flow (Grosu and Socoliuc, 2008). Thus, the cash generating unit can seem to be entirely recoverable when it actually suffered an impairment loss. In certain cases, even though certain assets contribute to the future estimated inflows of a CGU, they cannot be allocated to the CGU in a reasonable and consistent way (this may be the case of goodwill or other corporate assets, such as the headquarters' assets) – paragraph 77-IAS 36.

The recoverable value of a CGU is sometimes determined after taking into account the assets that are not part of the CGU such as debts or other financial assets, or unknown liabilities such as provisions for pensions and other provisions.

Summing up, the formula for calculating the carrying amount would be as follows:

a)Recoverable amount=Fair value-cost of disposal, **if**

Fair value - cost of disposal >Fair value- value in use (5)

b) Recoverable amount=Fair value-value in use **if**

Fair value- value in use> fair value –cost of disposal (6)

Where:

Fair value- Cost of disposal – is the amount that can result from the sale of an asset or a CGU during an unbiased transaction between interested and knowledgeable parties, minus the concession costs.

Value in use = is the discounted value of the estimated future inflows expected to be derived from an asset or a CGU.

The valuation of future cash flows includes the future investments needed to maintain or to support an activity within acceptable levels or rate of return. It can be influenced by the various risks incurred during different time periods or to the structure of the maturities of the rates of interest (paragraph 20-21 IAS 36).

As a starting point in such estimates, the entity could consider the following rates:

a) the entity's weighted average cost of equity, measured by using techniques such as the financial asset valuation model;

b) the entity's margin loan rates;

c) other loan rates on the market.

Special attention will be given to risks such as the country risk, the exchange rate risk and the price risk. The double summation requires that the discount rate should not include the risks for which the future cash flows estimates have been rectified.

The discount rate is independent of the entity's capital structure and of the way it had financed the acquisition of the asset, since the expected future financial cash flows derive from an asset and do not depend on the way the entity has concluded its asset purchase process.

If the discount rate had only been available at the value of the tax payments, it would have had to be adjusted in order to reflect a pre-tax rate.

III. DIFFICULTIES IN MEASURING AN ASSET'S VALUE IN USE BY CALCULATING THE CURRENT VALUE OF THE CGU

According to paragraph 6 of the IAS 35 standard, the following elements should be reflected when calculating an asset's value in use:

a) an estimate of the future cash flows that the entity expects to derive from that particular asset;

b) expectations about possible variations in the amounts or the timing of those future cash flows;

c) the time value of money represented by the current market risk free rate of interest ;

d) the price for bearing the uncertainty inherent in the asset;

e) other factors, such as illiquidity, that market participants would reflect in pricing the future cash flows the entity expects to derive from the asset.

The assessment of the value in use could entail the use of a discretionary dose, as this valuation is based on uncertain information and is subject to the provisions that should be gradually inspected by the valuation professional as the time period set for developing the testing draws to a close.

The difficulties met in measuring CGU mainly refer to the regulations related to the assignment period of the cash flow structure and to the calculation of the discount rate, such as the value in use of the interest held in controlled, associated or point venture business entities.

The cash flow estimates used in calculating the value in use should not exceed five accounting periods at the end of the current accounting period in order to conduct the impairment test. A longer period is only accepted if it can be justified and, for the accounting treatments of the fifth year, the flow should be extrapolated and

reference should be made to the constant or even decreasing growth rate consistent with the main operations of the entity, of the industry and/or of the geographical area it operates in.

The hypotheses used for calculating and determining the expected cash flows within a predetermined time interval should be constantly checked by the manager in order to ensure that they are still valid and that they haven't been contradicted by new events that might render future estimates inadequate due to the lack of any changes in them.

The time span to be considered when performing CGU valuations is the one related to the most durable assets of those believed to be vital.

IV. SOFTWARE SOLUTIONS FOR MEASURING AND ANALYSING THE CHANGES IN CGU

The second part of the paper will focus on the valuation of CGU by means of the software programmes SPSS – Statistical Package for the Social Sciences – and neural networks. These two programmes enable the comparison between the traditional analytical methods described and analysed in the first part of the paper and the results arrived at after estimating CGU by means of the SPSS and Neuroshell programmes.

This part of the paper will focus on the methods of measuring and estimating CGU and CGU flows on a group level. In this particular case, we have chosen a group with the generic name "VERO" SA. The data that has been used is available on the DAX index, the German capital market index which includes the largest 30 blue-chip companies listed on the Frankfurt Stock Exchange.

We have chosen to conceal the actual name of the group in order to protect the company's image, reputation and notoriety on the market, in light of the forecasts we have made in relation to CGU and CGU flow estimates.

A brief description of the SPSS and Neuroshell programs will precede the analysis of the estimates developed by the authors, so that the reader will acquire the necessary information related to the performance and functioning of these two programmes.

The SPSS (Statistical Package for the Social Sciences) programme is one of the most employed programmes in statistical analysis.

Neural Networks

Artificial neural networks are based on the biological framework of the neuron (fig.1.a) and consist of several nodes that incorporate artificial neurons. The interconnected nodes may be arranged in various topologies. The structure and the functioning of an artificial neuron is similar to the one shown in Figure 1b:

- The inputs are similar to the electrical impulses received by the dendrites form other neurons;
- The outputs are signals sent by the nucleus through the axon;
- A type of synapse will enable connections between the axon and another cell.

In theory, the artificial neuron (fig.1.b) mimics the behaviour and functioning of the biological neuron, but the artificial one learns by means of retroactive algorithms and the learning process is more difficult.

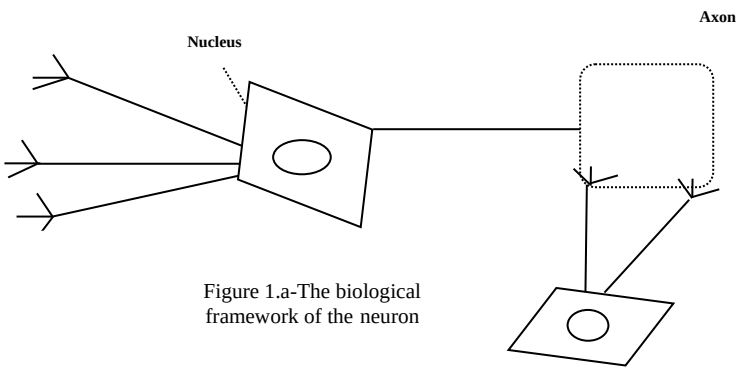


Figure 1.a-The biological framework of the neuron

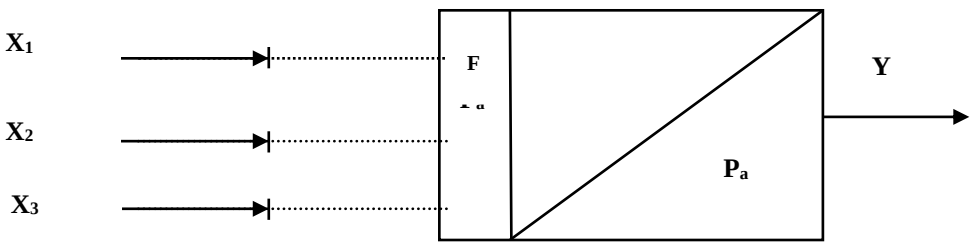


Figure 1.b-The artificial neuron

Where:
- Xi inputs
- Pi input weights
- S sum of weighted inputs
- F activation function
- Pa activation threshold
- Y neuron output/response

Note that there are several types of artificial neural networks, according to their configuration, complexity, etc. The most employed and most complex networks are the hidden layer (and multilayer) artificial neural networks.

V. DESCRIPTION OF THE FORECASTING METHODS

NeuroShell

CGU forecasts require a neural network of the three layer perceptron type (3 layers). The network has an input layer with five neurons, a hidden layer with 15 neurons and a single output neuron related to the forecasted amount. The one step ahead forecasting method is used, and the output value can be written in the following functional form:

$y = x_{n+1} = f(x_{n-4}, x_{n-3}, x_{n-2}, x_{n-1}, x_n)$,(7)

Where x_{n-4}, x_{n-3}, x_{n-2}, x_{n-1}, x_n are the network inputs.

The network training data will consist in the index values recorded during the time frame 01/1992 – 12/2012. Thus, the learning set is made up of 191 figures. A number of 144 of these figures will be used for the actual network training, while the remaining 47 will make up the test set. After the completion of the training process, the network will be tested by forecasting the following 3 values for future time frames, i.e. 01/2013 02/2013 03/2013

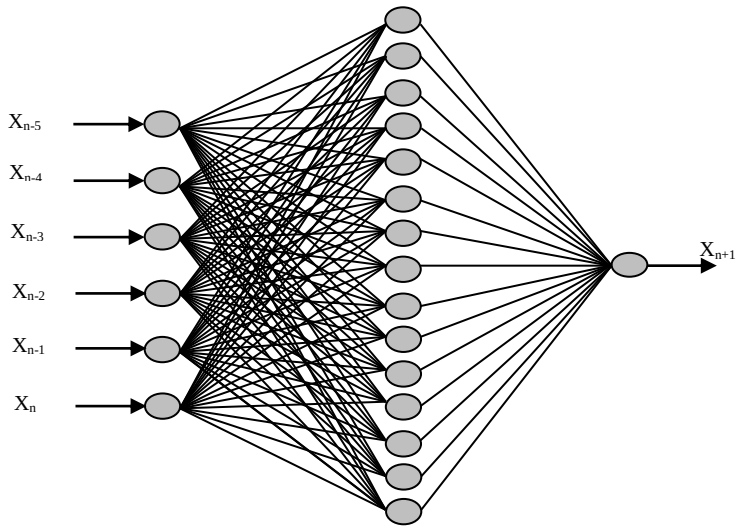


Figure 1.c. Network architecture for the CGU forecast, 6 neurons of the input layer, 15 hidden neurons and a single neuron in the output layer

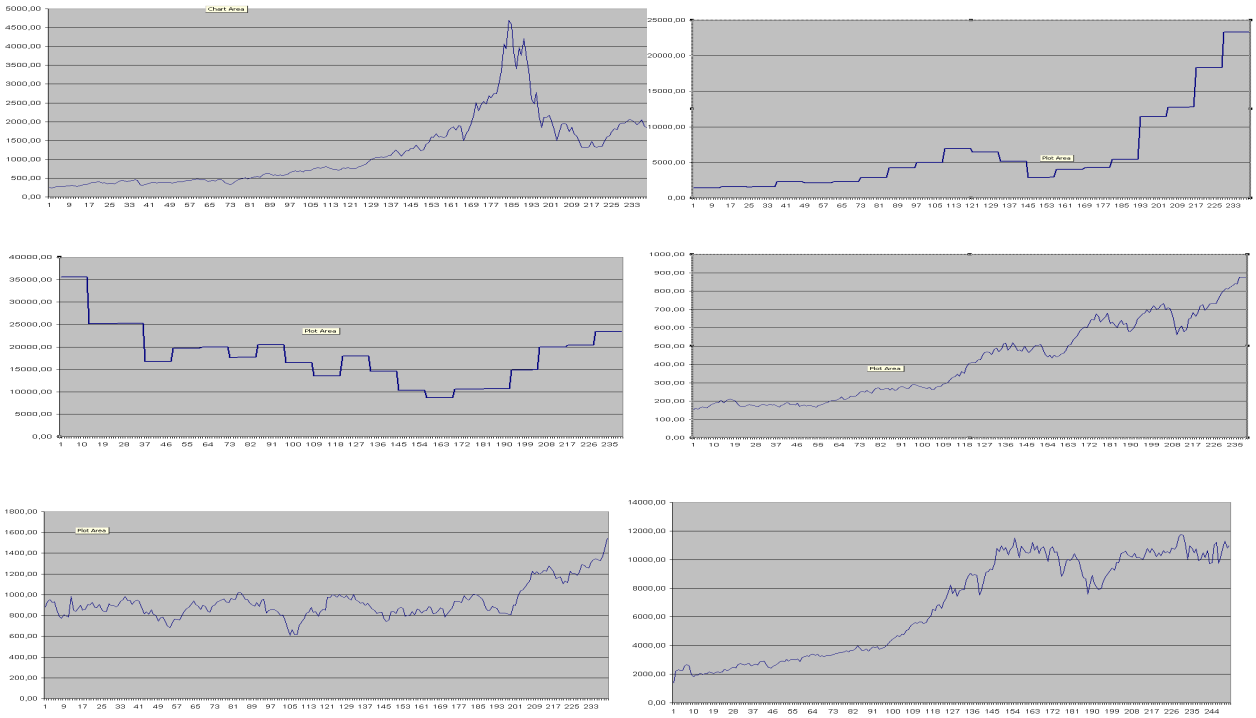
The following methods have been used for data forecasting: Simple, Winters Additive and Winters Multiplicative. The dependent variable has also been transformed in various ways: simple; square root; log natural.

After conducting 5 forecasting tests for each subsidiary, we have eventually settled on the optimal solution, i.e. the one that was closest to the initial data. The tables below show the actual data we have used to obtain the SPSS and Neuroshell forecasts (Ward and Sherald, 2006).

VI. USING THE SPSS PROGRAMME IN FORECASTING CGU AND CGU INFLOWS

As can be seen in the Tables presented in Annex 1 (table no. 1, 2, 3, 4 and 5) that show the amounts of CGU and CGU flows of the "Vero" SA group for the past 10 years, these flows did not follow a consistent pattern, as this is proof of the influence exerted by other variables, most importantly the increased rate of inflation that had a negative effect on CGU flows. The same tables we have mentioned earlier also show the forecasts for the following months of 2013.

Graphs no. 1, 2, 3, 4 and 5 - Changes in CGU and CGU flows at the parent company and the subsidiaries of the Vero SA Group during 1992-2012 and the forecasted CGU amounts for January/March 2013

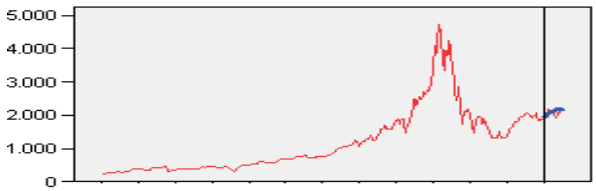


After feeding the data into the SPSS, the changes in CGU and CGU flows can be analysed (for the specified time frame). The above graphs show that these flows have undergone various changes, depending on each subsidiary, according to the criteria mentioned in the traditional accounting analysis detailed in the first part of the paper, such as: the specific activity of each subsidiary, the geographical location of each business entity, the structure of each CGU and CGU flows.

VII. COMPARATIVE ANALYSIS OF THE CGU FORECASTS BY MEANS OF THE SPSS AND THE NEUROSHELL PROGRAMS

The reason why the forecasts only cover a three month time interval is the fact that the CGU and CGU flows values are highly influenced by the increasing inflation rate, by economic, social and political insecurity affecting the environment of each business unit and by the depreciation and impairment loss of their underlying assets.

Parent company



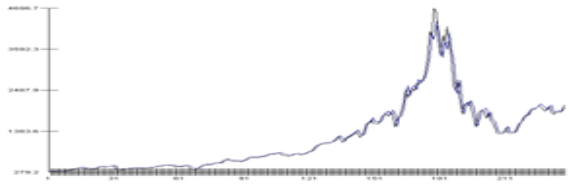
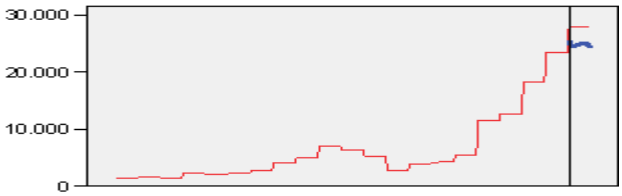


Fig. 8a SPSS Forecast Fig. 8b NeuroShell Forecast

Subsidiary 1



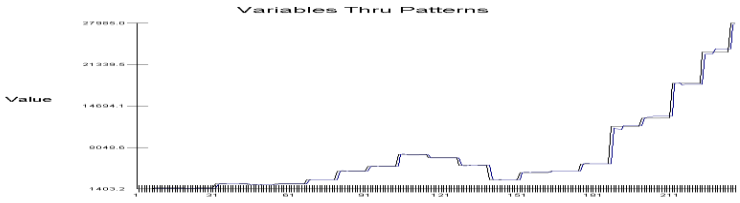
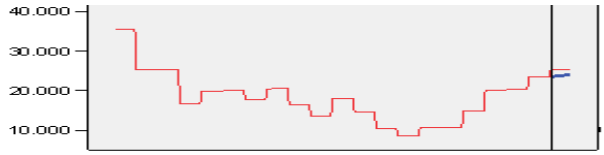


Fig. 9a SPSS Forecast Fig. 9b NeuroShell Forecast

Subsidiary 2



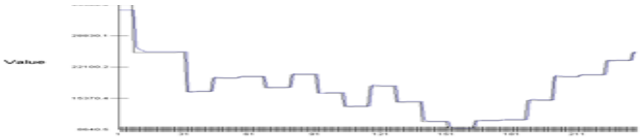
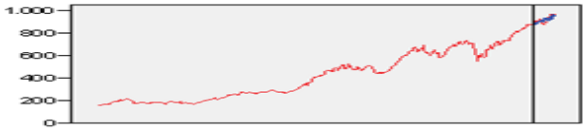


Fig. 10a SPSS Forecast Fig. 10b NeuroShell Forecast

Subsidiary 3



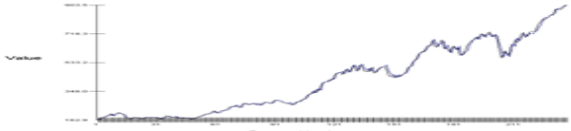
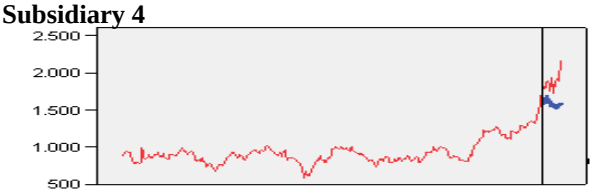


Fig. 11a - SPSS Forecast Fig. 11b – NeuroShell Forecast

Subsidiary 4



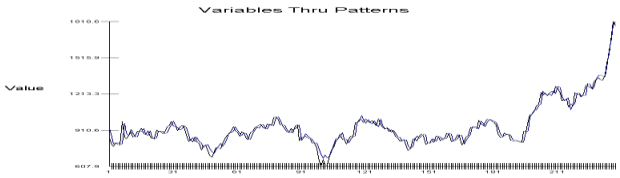
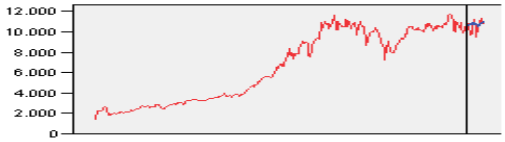


Fig. 12a SPSS Forecast Fig. 12b NeuroShell Forecast

Subsidiary 5



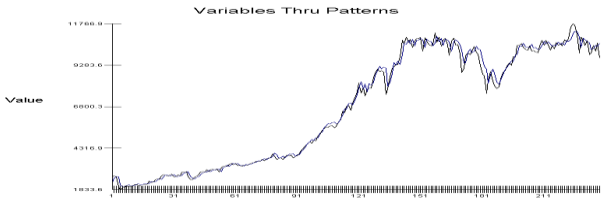


Fig. 13a SPSS Forecast Fig. 13b NeuroShell Forecast

After detailing the graphical representations of the best tests conducted by running the data with the SPSS program and with the NeuroShell programme, we will present a comparison between the data forecasted for January 2013, February 2013 and March 2013 with the actual data of the same months, followed by the calculation of the occurring errors.

Table 7- Comparison of the forecasted amounts

Parent company					
Month	**Actual data**	**Neuroshell Forecast**	**SPSS Forecast**	**Error calculation**	
				Neuroshell error	**SPSS error**
Ian 2013	**1896,84**	**1922,30**	**1929,70**	**25,46**	**32,86**
Feb 2013	**1974,99**	**1934,76**	**1970,13**	**-50,23**	**-4,86**
Mar 2013	**2096,80**	**2029,13**	**2045,43**	**-67,67**	**-51,37**
Subsidiary 1					
Ian 2013	**27983**	**24022,21**	**25504,13**	**-39,79**	**-24,7887**
Feb 2013	**27984**	**26902**	**27499,25**	**-10,82**	**-4,8475**
Mar 2013	**27985**	**26834,32**	**27493,59**	**-11,50**	**-4,9141**
Subsidiary 2					
Ian 2013	**25211**	**23349,39**	**23496,51**	**18,6161**	**-17,1449**
Feb 2013	**25212**	**25033,30**	**23545,30**	**-17,8770**	**-16,6670**
Mar 2013	**25213**	**25064,56**	**23594,20**	**-14,9**	**-16,1880**
Subsidiary 3					

Ian 2013	**889,10**	**892,9766**	**884,57**	**3,87**	**-4,53**
Feb 2013	**903,50**	**892,10**	**879,77**	**-11,4**	**-23,73**
Mar 2013	**902,90**	**900,5551**	**891,71**	**-2,34**	**-11,19**
Subsidiary 4					
Ian 2013	**1709,10**	**1675,839**	**1929,70**	**-33,26**	**-11,550**
Feb 2013	**1818,60**	**1786,702**	**1970,13**	**-31,89**	**-22,390**
Mar 2013	**1784,00**	**1790,261**	**2045,43**	**6,26**	**-16,225**
Subsidiary 5					
Ian 2013	**10133,90**	**10422,75**	**10313,76**	**28,8845**	**17,986**
Feb 2013	**10627,20**	**10390,23**	**10296,49**	**-23,6974**	**-33,071**
Mar 2013	**9726,33**	**10538,28**	**10422,48**	**8,11951**	**6,9615**

As shown in Table no.7, after comparing the results arrived at with each of the two programmes, the error margin for the parent company is not consistent and does not indicate any of the two programmes as the optimal programme for the valuation of CGU and CGU flows. If the SPSS induces an error margin of 32,86 in January, as compared to a value of 25,46, the Neuroshell is obviously the recommended choice for the valuation of CGU; the error calculation for the other two months – February and March – is clearly differentiated -4,86 as opposed to -50,23 (Neuro Shell) and -51,37 as opposed to -67,67 (Neuro Shell).

If we use the results obtained by the other subsidiaries of the group during the same forecasting time frame, the data arrived at with the Neuro Shell and the SPSS programmes could be rated within a 9 to 8 range.

The significant error differences that can be identified with both programmes were mainly due to the CGU flows related to intangible assets, as was the case with both the parent company and the second subsidiary in February 2013.

The significant differences also occur at the 1st Subsidiary in January 2013 or at the 4th Subsidiary in March 2013, following an increased inflation rate and due to the economic circumstances unravelling in the two geographical areas where the two subsidiaries are operating.

VIII. CONCLUSIONS

The topic of CGU and CGU flow valuation by means of the traditional accounting methods or by employing the new methods provided by the IAS/IFRS financial reporting standards remains a constant concern of professionals and researchers, both in the case of financial reporting prepared in compliance with national regulations as well as for those statements that comply with international standards.

As seen in the above analyses, determining the financial flows related to CGU is a particularly complex and difficult issue. The complexity of this process is augmented by the presence of certain variables, such as the uncertainty related to the generation of financial flows and, to a lesser extent, the optimal period during which these flows could be generated. Under these circumstances, determining the financial flows related to a CGU consists only in employing a specific method that can render as accurate and as reliable an assessment as possible.

The employment of the SPSS and the NeuroShell programmes in measuring these capital assets of a company is meant to emphasize and call attention to these valuation options in accounting, to encourage research in the field and thus enable the identification of the optimal method of measuring CGU and the ensuing forecasts that would allow for the least error margin on a short or medium term.

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