

# The process beyond the numbers and ratios

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## Abstract

Accounting numbers and ratios represent merely reflections of reality and have limited meaning and significance in and of themselves. They may contain embedded meaning, but extracting it requires creative skills of interpretation. The purpose of this study is to demystify the analysis and interpretation process. The study focuses on the conversion of data into knowledge, observations about the discovered world and the discovering person - the interpreter. An empirically tested reference base or proportional model is offered to assist in the performance of an organised interpretation.

## Key words

*Analysis*

*Ratios*

*Knowledge*

*Interpretation*

*Meaning*

## 1 Introduction

Assigning numbers to objects and observable phenomena is at the heart of accounting. Accounting is a social science that mimics facts and events and is judged good or bad by users to the extent to which they allow them to understand and interpret meaning. Many concepts in accounting cannot be observed directly. We cannot, for example directly observe profit, capital, reserves or the value of a company. We believe that each of the observed indicators is caused by an unobserved, or latent, variable of interest. We expect covariation among the observed measures, and we study the patterns of interrelationships among observed indicators to understand and characterize the underlying latent variable. Accounting measurements, which are reflected in financial statements, represent merely reflections of reality - numbers - which have limited meaning and

significance in and of themselves. Over-quantification is acute in the accountant's world. It is dominated by numerical data, calculations, measurements and ratios. Yet, quaint reasoning is crucial for extracting meaning. In practice financial ratio analysis and interpretation is primarily a response to the disclosure of information and is typically an ad hoc process. Experts often provide students and users with a list of recipes, models, ratios and benchmarks. It appears that the extensive use of financial ratios by both practitioners and researchers is often motivated by tradition and convenience rather than resulting from theoretical consideration.

The nature of business transactions and corporate financial condition is such that it cannot be clearly and completely reported by quantitative data alone. Yet accounting reports rely heavily on quantitative data. Text books describe the calculation of financial statement ratios but provide scant prescriptions as to how these should be used. The interpretation of financial data is a complex business in which relatively few investors are skilled (Bernstein 1993). They may contain embedded meaning, but extracting it requires creative skills of interpretation. How users acquire knowledge from financial statements is still a mystery (Gouws 1999). Meaning and significance come from and depend upon an understanding of the environment context from which the numbers are drawn as well as the relationship between the numbers and the underlying economic phenomena. The accounting position and performance is an organisations' response to the changes and the challenges in the environment. In this paper the need for and importance of interpretation is recognized. The first section discusses the difficulty to interpret financial numbers and ratios and refers to the scant prescriptions in textbooks and practices as how they should be used. The second section places emphasis on the accounting world from which the numbers are drawn. The following section describes the research methodology, hypothesis and main aims of the study. In section four, the process beyond the numbers and ratios is deduced from two interdependent angles: information and perception. It also reviews the conversion of data into knowledge. Attention is given to the discovered world, the discovering person and the discovered organization where an empirically tested model is offered to facilitate interpretation. The paper is concluded with a summary of the arguments presented and as well as some conclusions. The purpose of this article is to shed more light on the process beyond the numbers and ratios.

## **2 Background**

### **2.1 Accounting and decision making**

Accounting is a social science which lends itself easily to analysis as an information system, for it has all the attributes of a system (Glautier & Underdown 1995). The systems approach permits the integration of accounting into a coherent framework in which its role is concerned with the provision of information for decision making. The fact that accounting information are for decision making purposes, is widely accepted. During the past four decades, emphasis has been placed on the decision making aspect of accounting information (Moonitz 1961, Trueblood Committee 1973, Kam 1990). Since the objective of accounting is to provide useful information for decision making, it implies a decision orientated approach to accounting. Such an approach would be necessary to ascertain whether accounting achieves its purposes. Researchers who favoured a decision-usefulness approach argued that the starting point of such research should be a consideration of the objectives of financial statements (Ryan, Scapens and Theobald 1993).

Useful information possesses two primary characteristics: relevance and reliability (FASB 1980). Information is only relevant when it makes a difference in the decision of the user. This is only possible when information have predictive and/or feedback value. Feedback about the consequences of decisions taken, will improve the decision makers' ability to predict future possibilities. Its is therefore not surprising that the accounting conceptual framework include these two qualitative characteristics in the hierarchy of accounting qualities as mechanisms to make information useful. The FASB (1980) defined the concept of predictive value as the quality of information that helps users to increase the likelihood of correctly forecasting the outcome of past or present events. If accounting information are to be relevant and useful, they must provide or permit predictions of future objects or events. The predictive ability concept has considerable potential for future development of relevant financial reporting (Hendriksen & Van Breda 1992). Prediction is something humans do consciously, based on some explicit model or anticipation of the environment. However, the emphasis on prediction leads to the following question. How can any system, natural or artificial, learn enough about its universe to forecast or predict future events or performance? The solution is feedback from the environment. If the system survives the turbulence, the system is adjusted to do better next time (Strank 1983).

In spite of accounting's noble objectives and qualitative characteristics, there are evidence that accounting information may not be useful at all "... there is no mechanical relationship between financial information and investment action" (Helman 1996:672). In fact, none of the studied investment actions could be directly linked to the release of a financial report. Cooper *et al* (1992) stated that interpret financial statements have lost all relationship to the economic reality, they purport to represent.

## **2.2 Usefulness of accounting information**

The primary objective of analysis and interpretation is to make accounting information comprehensive and usable in decision making. "What we are looking for is empirical substantiation of accounting practices. We know that such substantiation centers on the usefulness of accounting data ..." Kam (1986:512). A system without interpretation or analysis of the results serves no useful purpose and may encourage misinterpretation or misuse, to the detriment of the professional accountant, as well as the interested parties. The question of the relative usefulness of annual reports is still an open and controversial question. There are a number of possible reasons to explain the lack of usefulness of annual reports. One possible reason is that annual reports are too difficult to understand. Another possibility is that the interpretation process is not fully understood. There is a strong, statistically significant relationship between the usefulness of both the income statement and the balance sheet with experience (Epstein & Pava 1993).

## **3 Research methodology, hypothesis and main aims**

The study of financial analysis and interpretation is a social science. It involves understanding how people (accountants and users) behave in creating, exchanging, and interpreting financial messages. Consequently, inquiring about the process beyond the numbers and ratios combines both scientific and humanistic methods. Science focuses on the discovered world; humanities focus on the discovering person (Littlejohn 1989). Interpretation theory is basically multidisciplinary (Gouws 1999), but it is also a fact that more "theory" is being created within the field of financial analysis and interpretation itself. For these reasons the various activities and facets beyond the number were contextualized by:

- an interdisciplinary humanistic approach regarding the discovering person, based on relevant literature from the following angles:
  - Knowledge management theory

- Communication theory
  - Strategic thinking
  - Cybernetics
- an empirically developed proportional model regarding the discovered organization, to assist in the interpretation of financial statements and to provide a suitable reference base to determine whether an organization is out of balance (based on the hypothesis that there is a "balance" for every organization).
- practical feedback based on the experience gained by the authors in the field.

The aim of this paper is to:

- shed more light on the process beyond the numbers and ratios by focussing on the clusters of human behaviour that encompasses the interpretation process
- develop an proportional model which can be used as an aid to interpretation by determining whether an organization is in balance
- bring accounting closer to its goal of user decision usefulness by empowering users with proven principles, tools and attitudes that mould perceptions which is necessary for knowledge creation.

## **4 Process beyond the numbers and ratios**

### **4.1 Conversion of data into knowledge**

Looking at the process beyond the numbers and ratios from an accounting viewpoint alone is not particularly useful inasmuch as it is not a single, unified act but a process consisting of numerous clusters of human behaviour. The biggest obstacle to this embracing process is the tendency to view analysis and interpretation from the narrow confines of the accounting methods of constructing knowledge (Gouws 1999). Inter-disciplinary interaction is essential for a useful understanding of this behaviour.

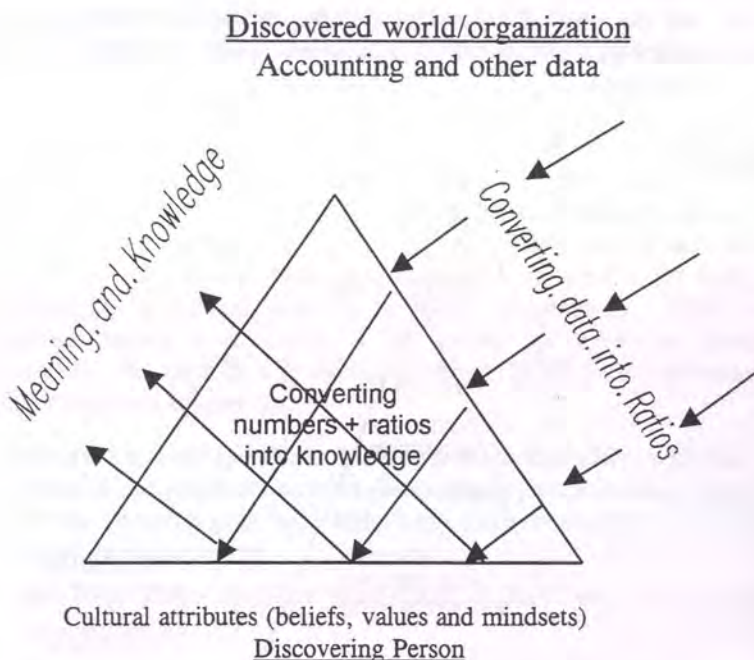
The main aim of the process beyond the numbers and ratios is one of creating knowledge. Knowledge from the financial and other data is a product of human activity. Creating knowledge is not a matter of mechanistically processing or analysing data and information. Rather, it

depends on tapping the tacit and subjective insights, intuitions and beliefs of users (Nonaka 1998). Knowledge is created by discovery – something users get from the financial and other data by observing it; by interpretation. The interpretive user cannot discover knowledge intact because reality is not independent from the human mind. Knowledge from the financial information is a transactional product of the knower (user) and the known.

What makes a good interpretation is not a question of validity in the traditional sense, but a question of utility. Interpretation must help to understand, to use and to intervene. Any interpretation of reality is strongly conditioned by subjective, theoretical and cultural factors. Beliefs and values are used to interpret the meaning of accounting measures and ratios and to decide whether an action is worthwhile (Gouws 1999, Littlejohn 1989). Several writers refer to a “conversion” of data into knowledge:

- Bernstein (1995:3) “... *converting data into meaningful relationships*”  
This “conversion” encompass the analysis phase to create ratios.
- Wristen (1986:65) “The incessant production of new data creates a paradox; information, the thing that eliminates uncertainty, now increases everybody’s feeling of insecurity because of the failure to *convert data into knowledge*”
- Nonaka (1998:39) Users “... find it extremely difficult to turn (convert) that information into useful knowledge”.

**Diagram 1:** A diagram of the conversion of data into knowledge can consequently be visualized as follows:



Sources: Own observation

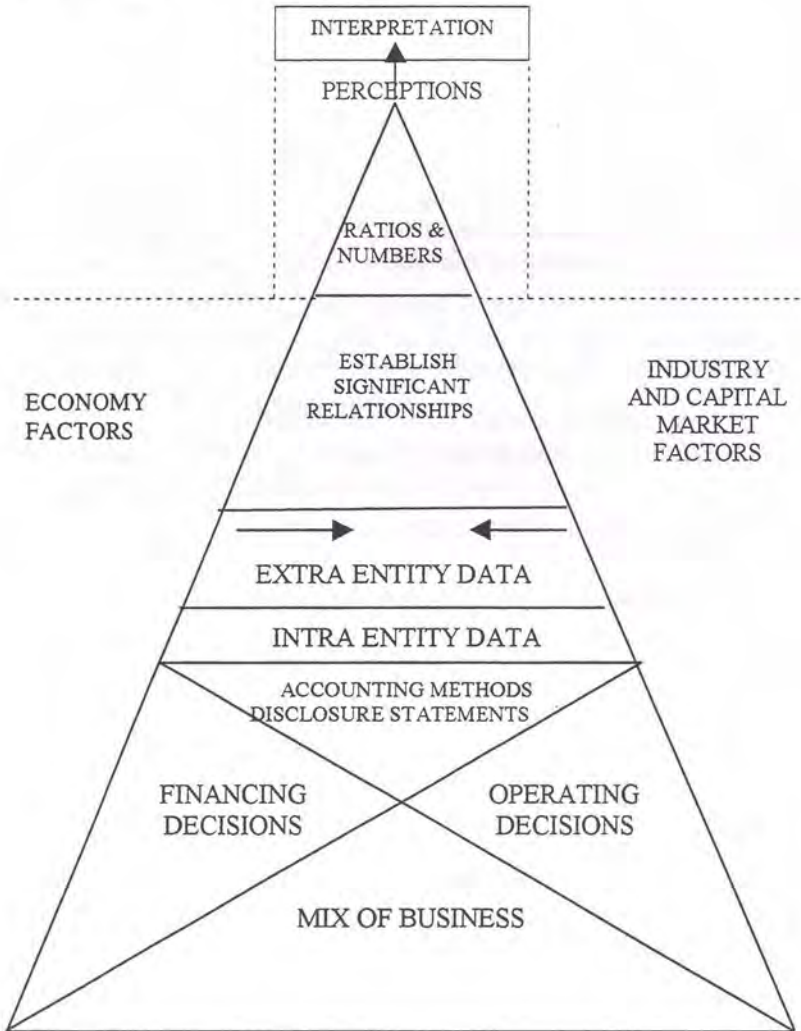
## 4.2 Observation about the discovered world

Traditionally accounting and financial numbers only show results – a focus that largely concentrates on the output of systems. They seldom tell users how the results were achieved. They only give part of the clues to the changes in the forces, processes and capabilities that determines the numbers. Numbers are only the reflection of an entity's ability to position and maneuver itself in terms of the internal choices that is available as well as the external forces or constraints that are prevailing. For this interpretation purposes, it is necessary to shed some light on the various inputs of the accounting and financial information kingdom. Numbers are like the proverbial tip of the iceberg.

Numbers and ratios are affected by entity-orientated, industry, market and economy factors. The following interactive overview presents a perspective on the factors and forces that

- shaped the entity
- set the scene for internal (intra) variable and external (extra) variables which should be considered when interpreting numbers and ratios.

**Diagram 2**





Meaning – a prerequisite for knowledge – comes from and depend on an understanding of the influence and energy of all the dispersive structures and systems from which the observations are made. An entity's financial status and performance – as portrayed by financial statements, is an organization's response to these forces and changes in the related information sphere. The real challenge is to recognize an organization's position in relation to the broader picture.

An entity's ability to survive depends largely on synchronizing the controlled (internal) and uncontrolled (external) variables. This truth will be explored further in section 4.5. Communication channels across an entity's external boundaries – from the uncontrollable environment to the controlled set of variables back again – help to ensure that an entity is synchronized; in balance with its turbulent surroundings. The more exogenous variety it confronts – the greater its need for external information. Research by Chenhall and Juchau (1977) on the information needs of investors suggest that:

- information, both specific and non specific to the entity, which is not disclosed in the corporate report, bears strongly on share decisions. In the top 18 rankings at least eight items have their origin outside the annual corporate report.
- only 30% of the investors rated financial statements as their most important source.
- contemporary items play a major part in assisting any interpretation.

### **4.3 Converting data into ratios**

Accounting and financial ratios have been, and continue to be, a popular tool for analyzing a company. The subject of financial analysis has probably received more academic interest in recent years than any other in accounting and finance. One reason for the interest is the recognition that it stands as a cornerstone of both finance and accounting. The popularity of financial ratios attest to their perceived utility when making financial decisions. All practical finance is based on the interpretation of financial information, and it is the 'raison d'être' of accounting. Few figures in accounting information are meaningful in themselves. Only in relation to other figures is perspective and understanding achieved.

The activity of financial statement analyses consist of the application analytical tools and techniques to financial statements and data in order to derive from them measurements and relationships that are significant and useful for decision making (Bernstein 1995). The first and most important

function of financial statement analyses within the decision making process is to convert data into meaningful relationships, expressed as ratios. This process – also called the life after financial statements (Gouws 1997) – can be used as a

- preliminary screening tool in the selection of investment opportunities/merger candidates
- forecasting tool of future stock prices, financial conditions and risk and performance
- diagnosis of managerial and management strategy
- benchmarking tool
- cognitive help to reduce reliance on pure hunches, guesses, and intuition, and thus reduces and narrows the inevitable areas of uncertainty that attend all decision making processes (Bernstein 1995).

Users rely on simplified representations of the real world. These representations, called 'cognitive maps' or 'mental models' consist of concepts and relationships that are needed to understand various situations or environments (Srinivas and Shekar 1997). Empirical concepts such as ratios are open-ended or essentially incomplete because it is not possible to formulate a complete description of them. The precise measurement or calculation of a ratio is profoundly different from the interpretation, significance, and meaning of a ratio. Meaning is important, not measurement per se. Measurement appears to be precise, objective, and simple (it is not any of those) whereas meaning appears to be vague, subjective, and complex (it is all of those).

#### **4.4 The discovering person**

##### **4.4.1 The social reality (The human connection)**

Users' need to interpret financial information has been singled out as the 'raison d'être' of accounting. Accounting is a human creation designed by humans to satisfy certain human needs. As a social activity, accounting acts as an influence on and is itself influenced by human behaviour. The differences between the diverse stakeholders of an entity as a result of differences in culture, beliefs, education, perceptions, behaviour etc. generate a wide spectrum of opinions and beliefs (Gouws 1994). The interpretive framework is determined by an anticipated future. Perspectives about what is expected, wanted and hoped for depend in turn on past experiences and interpretations. For each subsequent interpretation corrects the generalizations of the previous ones on the basis of negative experiences (Littlejohn 1989).

The starting point for an interpretive approach is the belief that social practices, such as accounting and ratio analysis, are not natural phenomena; it is socially constructed. This means that users should not be looking for universal laws and generalizations, but for the rules, both explicit and implicit, which structure social behaviour (Ryan *et al* 1992). Interpretation is a knowledge creating activity and begins with the individual. Accounting numbers, measures and ratios are symbols that reflect and support the values, beliefs and mindsets of the stakeholders. These collectively shared – but individually different – beliefs guide the behaviour of people at subconscious level. Values are used by interpreters to interpret the meaning of accounting, measures, numbers and ratios. Ansari *et al* (1997) distinguish the following cultural dimensions:

- Beliefs and ethical values are used to interpret and decide whether an action is worthwhile.
- Mindsets represents the collective world view that dominates the thinking of a group, culture or society.
- Values such as tradition prevent people to accept change.

One can assume that the knowledge encapsulated in the data and information awaits discovery. Although the accounting process encompasses the observation of known events and the fixation and reporting thereof, those events and transactions can be conceptualized in a variety of useful ways and can never be ascertained purely without the imposition of a *set of concepts and values*. Different financial statements observes will see different things and varying potential possibilities in the observed events, because they assign and conceptualize them in different ways. Each user's knowledge is coloured by this perspective. Who one is determines what one sees in financial statements (Gouws 1999).

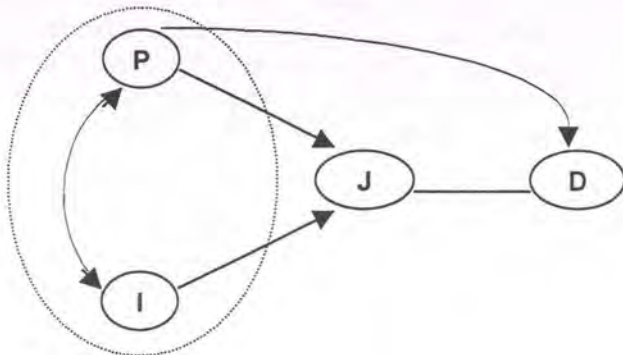
Comprehension implies the understanding of the whole rather than individual parts alone. The analyst employs concepts of great generality such as 'matter', 'mind', 'form', 'entity', 'process', which are comprehensive in that they apply to the whole range of human experience. He also tries to discover relationships between seemingly diverse aspects of the world, and through these connections to comprehend the world as a meaningful whole (Mautz and Sharaf 1961). Users don't just passively receive new knowledge, they actively interpret it to fit their own situation and perspective. Therefore, what make sense in one context can change or even lose its meaning when communicated to users in a different context. As a result, there is continual shift in meaning as new knowledge is disclosed.

#### 4.4.2 Perception and information

Users acquire knowledge through a mental process, consisting of information (conception) and perception (Gouws 1999). There is agreement that perception and information (conception) are interrelated mental actions leading to the acquisition of knowledge (Rodgers 1997; Mautz & Sharaf 1961). Interpretation implies the mental reconstruction and combination of sense given data within a combination of two contrasting modes, perception and information. Perception indicates how decision makers filter, select and interpret certain types of information (Gouws 1999). To convert tacit knowledge (based on mental models, beliefs and perspectives) into explicit knowledge means finding a way to express the inexpressible (Nonata 1998).

Understanding the process beyond the numbers and ratios requires an understanding of these two modes and also understanding the ways in which the integration between them shapes the decision maker's interpretation and judgement. The information and the decision maker's prior beliefs (perception) are relevant to perceiving the degree of covariation between them. The following decision making model has been adapted to shed some light on the interdependency of information and perception which form the basis of interpretation.

**Diagram 3: Individuals decision processes**



Interpretation:

Where: P = Perception

I = Information

J = Judgement

D = Decision choice

Source: Rodgers (1997) adapted

Users perceptual frame allows them to use their prior experiences – which regulate their perception – in selecting and interpreting information. By themselves, perceptions are isolated experiences having little intellectual value beyond the effect of their initial impact. "... perceptions may influence the weights placed upon the presented information" (Rodgers 1997:39). For the interpretive user, knowledge cannot be discovered intact because reality is not independent from the human mind. Different users will see different things in the stream of information because they assign different meanings to it and conceptualized it in different ways. What mediates between the user (the interpreter) and the information, then, is a perspective based on a perception, and knowledge is always colored by that perspective. Perspective, calls for the breath of outlook necessary to grasp the true and full significance of things in order to make well grounded judgements about it (Mautz and Sharaf 1961). When an analyst or user relate back to information and ratios, he constructs mentally a whole made up of parts which take definite shape and character by their initial interrelationships.

The *first* stage of interpretation includes perceptual processing and information. Perceptual processing involves encoding (where a set of facts processed by the user/decision maker is part of his knowledge structure). This set of facts is represented in the accounting measurement system. This stage may be preempted by heuristics and biases (Habermas 1972, Rogers 1997). Users can draw upon their existing knowledge base to generate constraints on the information. The *second* stage of interpretation is influenced by both sources of perceptual effects and information sources and represents a culmination of information processing and knowledge acquisition. This means that users may base their decisions partly on information that has no obvious or clear-cut meaning. Mintzberg endorses the perception mode: "... even the best knowledge of the past may not help to see the future. What is the key, then, is not to extrapolate trends, but to foresee discontinuities. And for that, there are no techniques – you have not much more than informed, creative intuition" (Mintzberg 1995:68). The interdependence between perception and information not only suggests that perception can dominate information and also dominates user's actions but that information can dominate perception and user's primary method of decision making.

Although the focus in this study is on numbers and ratios as a means to create knowledge, financial reports contain many other visual elements including photographs, graphics, graphs which is an important feature of financial statements. There is evidence that every conceivable design device has been used by entities to portray it and the top management in

the best possible light and to influence the perception of certain stakeholders (McKinstry 1996).

#### **4.4.3 Strategic thinking**

Interpretation involves determining direction. Direction giving is related to strategic thinking which means seeing ahead. A user cannot see ahead unless he or she can see behind because any good vision of the future has to be rooted in an understanding of the past (Mintzberg 1995). The similarity between a strategic thinker and an interpreter is obvious. They see differently from other people; they pick out the precious revealing relationships that others miss. They challenge conventional wisdom - the industry recipe or ritual where a two to one ratio for the relationship between current assets and current liabilities is still the norm - the ordinary interpretation perceived by everyone else who can't see the whole picture - and thereby differentiate their decision making. Mintzberg (1995:69) refers to, "Seeing beyond, ... constructs the future itself - it invents a world that would not otherwise be".

Capitalism is based on the concept that somebody must observe and see more. The interpretation process creates a paradox: this knowledge creating process which is intended to reduce uncertainty can and must only be utilized by a few to gain a competitive advantage. It is important to emphasize that a company's future direction needs to be open-ended, susceptible to a variety of different and even conflicting interpretations. "You should look at everything in terms of look in/out, which is a mental operation. It embodies the concept of gestalt, figure and ground, and of turning inwards and outwards in conceptual space" (Rhodes 1995:91).

### **4.5 The discovered organization**

#### **4.5.1 Complex adaptive system**

An organization is an example per excellence of what Holland (1992) called an "complex adaptive system". Such systems share the following properties. Each system is in real fact a network of many relationships or agents acting in parallel. Each agent finds itself in an environment produced by its interactions with other agents in the system. It is constantly acting and reacting and because of that nothing in its environment is fixed. "Complex adaptive systems are constantly revising and rearranging their building blocks as they gained experience" (Waldrop 1992:146). So business environments are in some measure always "negotiated environments", rather than an uncontrolled mix of hostile external forces.

Another feature of complex adaptive systems is that they anticipate the future. The anticipation of an opportunity or an event may lead management to react to that. Any company is therefore constantly making predictions based on its various internal models of the world. Because a system is always unfolding, always in transition, it is essentially meaningless to talk about a complex adaptive system in equilibrium. "In fact, if a system ever reach equilibrium, it isn't just stable. It is dead" (Waldrop 1992:147). It can therefore be argued that the success of an organization is a question of a state of balance indicating whether the organization is in harmony or in the correct proportions. When an organization becomes unbalanced, for example when an organization grows too fast, over-trading occurs. "Over-trading may indicate an excessive volume of business activities floating on a too thin margin of invested and readily available capital ..." (Gouws 1995:4). He also stressed the fact that managers should be aware of these interrelationships within their own businesses when they plan their growth strategy. Balance within the interrelationships must therefore be the ultimate goal of an organization to be efficient.

Managers rely on simplified representations of the real world. "These representation, called 'cognitive maps' or 'mental models', consist of concepts and relationships that are needed to understand various situations or environments" (Srinivas and Shekar 1997:99).

#### **4.5.2 Hypothesis for the Proportional Model**

If a reference base or balanced model that is suitable for an organization can be developed, the interpretation quality of the financial statements will be enhanced. A great deal can be learned from the interrelationships among the various accounts (Bernstein 1993:38). A company that will serve its stakeholders needs to be productive and flexible. A balance between productivity and flexibility should therefore also be maintained. To assist in the interpretation of financial statements and providing a suitable reference base, the proportion model is proposed. With the proportion model, financial statements for a business that is in the correct proportion, is prepared.

The premise of the proportional model is that only a few selected relationships will yield the information the analyst really needs for useful insights and decision support (Helfert 1997). For a company to be in proportion the ability/asset ratio should firstly be correct (a balance sheet that is in proportion). Secondly the relationship between profit and equity should be in proportion (the income statement must balance on the balance

sheet). If a company is out of balance, and management is unable to bring it back into balance within a relatively short period, it is either under-trading or over-trading. When under-trading, the company will be forced out of the market by competitors, when over-trading, the risk of encountering liquidity and eventually solvency problems increases.

With only assets, required rate of return on total assets and the interest rate on borrowings as inputs, the abridged income statement and balance sheet can be computed to show how the company should appear when in total balance. By comparing the actual financial statements of the company to the ideal financial statements, existing as well as potential problems can be identified. Numerous ratios of the ideal financial statements can also be compared to the ratios of the actual financial statements. The task of interpreting a financial statement analysis is thereby enhanced and simplified.

In order to find the correct proportions, the gearing ratio, which reflects the relationship between profit, assets and liabilities, was considered for further investigation. All movements in the balance of a company will be reflected in the gearing ratio.

Consider the gearing ratio:

$$\text{Gearing ratio} = \frac{\text{ROE}}{\text{ROA}} = \frac{P}{A-L} \times \frac{A}{P+I}$$

where, ROE = Return on equity

ROA = Return on assets

A = Total assets less non-interest bearing liabilities

L = Interest bearing liabilities

P = Profit after interest and tax

I = Interest (after tax)

In order to benefit from debt the gearing ratio must not be less than one. If the gearing ratio is less than one, no benefit is obtained from additional debt. The gearing ratio also has a limit which is determined by  $A/(A-L)$ . With assets and liabilities constant, irrespective of how high profits are and how low interest rates drop, the gearing ratio can not exceed the limit. The question is, what is the ideal gearing ratio? It should be somewhere between one and the limit.

By keeping assets and liabilities constant and increasing profits by equal increments, the gearing ratio appears as a smooth curve for different profit



levels when plotted. Plotting ROE for the same profit levels, a straight line is obtained. The maximum benefit (through debt) will be obtained where the difference between the gearing ratio and ROE reaches a maximum. That is the point where balance between assets, liabilities and profit is obtained. The point where the business is operating at maximum efficiency. It is neither over-trading nor under-trading. Shareholders funds are utilised to their best advantage for a given level of risk.

For each business the optimum level of profit, liabilities and interest can be computed mathematically so that a condensed balance sheet and income statement can be prepared. Diagram 4 shows the condensed financial statements that was prepared for research purposes.

#### Diagram 4

##### Condensed "in balance" financial statements

Gross revenue  
 Expenses  
 Profit before interest and taxation  
 Interest  
 Profit after interest and taxation  
 Net funds (assets less non interest bearing liabilities)  
 Interest bearing liabilities  
 Equity

Gross revenue and Net Funds appearing in Diagram 4 are actual figures. The other figures are calculated using the formulas of the proportion model and based on the required return on assets.

#### 4.5.3 Empirical research

- Objective:

The objective of the empirical research was to determine whether the results of the proportion model provides the analyst with meaningful answers.

- Data:

From the industrial companies listed on the Johannesburg Stock Exchange, a selection of companies to be included in the research were made. Companies that have been listed for at least five years (1994-1998) without major changes to their capital structures, were selected. A total of 80 companies remained on which the research was performed.

• Methodology:

For each company, an abridged "in balance" balance sheet and income statement (refer diagram 4), using the formulas of the proportion model, was prepared. The actual 1998 net profit after taxation was then compared to the net profit after taxation in the balanced income statement to determine the degree of efficiency. The level of efficiency was used as the dependent variable in a multiple regression analysis.

Efficiency is measured as how far the actual profit is from the required profit. For example, if the actual profit of a company is 0.7 of the required profit, the company would be as efficient as a company with an actual profit of 1.3 of the required profit. The one company would be under-trading and the other over-trading but the deviation from the desired situation is the same

A ratio analysis, concentrating on profitability and productivity, was performed on each company for each of the five years from 1994 to 1998. From the ratio analysis the following were taken as independent variables in the regression analysis:

- Annual increase in profit
- Number of consecutive years that profits increased
- Annual increase in return on equity
- Number of consecutive years that return on equity increased
- Gearing ratio for 1998
- Annual increase in gearing ratio
- Turnover ratio for 1998 (gross revenue/assets)
- Annual increase in earnings per share
- Number of consecutive years that earnings per share increased
- Movement towards or away from balanced position (a dummy variable of one was allocated if the company is moving towards a balanced position and a variable of zero was allocated if the company is moving away from balance)
- Annual increase in productivity (productivity was measured as: value added/salaries)

The data was analysed by means of multiple regression to determine if there is a linear relationship between efficiency (as defined) and the financial health in terms of profitability and productivity. Forward stepwise regression was applied to select the variables indicating the best correlation with the level of efficiency. Only those independent variables that are

significant (as indicated by the t-statistic at A 0.05 level) have been selected by the model.

- Results:

The results of the multiple regression analysis are summarised in Diagram 5. The t-statistic gives an indication to what extent the variables are important in the model. All the variables selected by the stepwise regression, appearing in Diagram 5, are of importance.

### Diagram 5

Regression analysis results		
Correlation coefficient	0.89	
R <sup>2</sup>	0.8	
Variables selected:	Beta coefficient	t-statistic
Number of years that profits increased	0.17	1.28
Gearing ratio	0.35	4.87
Annual increase in gearing ratio	-0.35	-4.92
Annual increase in productivity	0.16	2.86
Turnover ratio	0.17	2.48
Number of years that EPS increased	0.24	2.02
Annual increase in return on equity	0.14	2.08
Movement towards or away from balance	0.15	1.91

As can be seen from Diagram 5, very good results with a correlation coefficient of 0.89 was obtained. This is an indication of a strong linear relationship between efficiency and the independent variables in the data subjected to the test. Surprising however is that although there is a strong positive correlation with the gearing ratio in 1998, the annual increase in the gearing ratio was negatively correlated. The model prefers a high stable gearing ratio that does not grow to rapidly.

Based on the tests performed it appears as if efficiency, which is a function of the proportion model, is an indication of the financial health of a set of financial statements.

- Conclusion:

An analysis and interpretation of financial statements is performed to provide the analyst with answers (mainly answers regarding the future performance of a business) to support decisions. The success of an

analysis is dependent on the quality of the interpretation. Where the method of interpretation has never been structured or formalised, this paper, proposes the proportional model that assists in the performance of an organised interpretation.

The proportional model was tested empirically. The test results showed a strong correlation between the financial health of a company and the efficiency (which is determined through the proportion model) of the company. Based on the test results, the contribution of the proportion model to interpretation appears to be promising. The proportion model provides the ideal reference base for every one of the main items in the financial statements.

There are other advantages of the proportion model that could be considered for future research. It should, for example, be easier to predict future profits and value the shares of the "balanced" financial statements, which can then be expressed in terms of the real company. However, other benchmarks for balance may exist which may not necessary produce the same empirical results. Statistical generalisations do not provide exploration of individual cases. Their objective is to derive general laws and theories, which simplify our understanding of the empirical observations (Ryan *et al* 1992).

## **5 Summary and conclusions**

The study aimed to demystify one of accounting's biggest problem areas, interpretation. Because interpretation is a human exercise, the focus in the past was on accounting data and ratios which led to a myopic view of financial analysis and interpretation where financial phenomena were considered only in terms of their statistical properties or in terms of their compliance with models of market behaviour. The study focuses on the human and statistical dimensions within the interpretation process. This was done by establishing a logical and visual framework in which numerous clusters of human behaviour were related and explained. This clearly indicated the importance of examining the cognitive process in order to understand the subtle and indirect human effects that will help interpreters and practitioners to avoid errors in judgement. An empirically tested proportional model was offered to provide an ideal reference base for interpretation. The study's approach will also help pave the way for further interdisciplinary research.

The following conclusions are reached: by making accounting information easier to analyse, not only is the quality and usefulness of the information increased, but the primary purpose of accounting, namely the provision of useful information to interested parties, is realised. The theory of analysis and interpretation provides new challenges to the accountant necessitating that the standard of the contents of the published information is so presented that it answers to the needs of an analyst. Wrong conclusions may be drawn from using a too limited set of information. The use of analytical aids and techniques such as charts, graphs, flow diagrams, etc., increases the usefulness of the information. The right of the user to information, which must be acknowledged, and the satisfaction of his needs must be reasonably conceded to. The dramatic change from accountant or analyser to interpreter is tremendous. When a person sits as an interpreter, he is no longer an accountant, he has an entirely different task to perform and a substantially different calling. He must bring to his new calling a different point of view, a much bigger picture, a sense of detachment, an impartiality that would be out of place when he acted as an accountant. He needs a different way of thinking.

To think philosophically about ratio analysis and interpretation is to adapt a synoptic view through which the discipline can be comprehend in its totality and in relation to the world at large, to consider every issue in the light of aggregate interrelationships, to penetrate beyond casually accepted beliefs to the implicit premises of its reasoning (Mautz & Sharaf 1961). In conclusion: There is a need for a body of knowledge in which the principles, theoretical structure, objectives, etc., are contained.

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