

|   |           |
|---|-----------|
| <b>INTRODUCTION .....</b>   | <b>2</b>  |
| 1. CONCEPT OF FIRM PERFORMANCE.....   | 3         |
| 1.1 <i>Intended Strategy - Realized Performance</i> .....   | 3         |
| 1.2 <i>Three Levels of Strategy - Three Levels of Performance</i> .....   | 5         |
| 1.3 <i>Scope of Firm Objectives - Scope of Firm Performance</i> .....   | 7         |
| 2. TRADITIONAL MEASUREMENT OF FIRM PERFORMANCE .....  | 10        |
| 2.1 <i>Financial Performance Measures</i> .....   | 19        |
| 2.1.1. Accounting Rates of Return.....  | 24        |
| 2.1.1.1. The Fatalistic View .....  | 25        |
| 2.1.1.2. The Utilitarian View .....   | 27        |
| 2.1.1.3. The Constructive View .....  | 28        |
| 2.1.2. Price Above Long-Run Average Cost .....  | 39        |
| 2.1.3. Price Cost Margins .....   | 41        |
| 2.1.4. Market Based Performance Measures .....  | 42        |
| 2.2. <i>Operational Performance Measures</i> .....  | 51        |
| 2.3. <i>Organizational Effectiveness Indicators</i> .....   | 54        |
| 3. STRENGTHENING THE CONSTRUCT VALIDITY OF FINANCIAL PERFORMANCE MEASURES.....  | 54        |
| 3.1. <i>From Accounting Rates of Return to Residual Income</i> .....  | 55        |
| 3.2. <i>Economic Value Added<sup>TM</sup></i> .....   | 56        |
| 3.3. <i>Added Value</i> .....   | 57        |
| 3.4. <i>Additional Points of Interest for Assessing the Construct Validity of Superior Performance Measures</i> ..... | 61        |
| <b>APPENDIX 1.1: SOURCES AND FREQUENCY OF REFERENCES IN REVIEW LIST .....</b>   | <b>62</b> |
| <b>APPENDIX 1.2: CHRONOLOGICAL PLOT OF THE NUMBER OF REFERENCES.....</b>  | <b>63</b> |
| <b>APPENDIX 1.3: CHRONOLOGICAL PLOT OF THE NUMBER OF PERFORMANCE CONCEPTS.....</b>                                    | <b>64</b> |
| <b>APPENDIX 1.4: CHRONOLOGICAL PLOT OF THE NUMBER OF PERFORMANCE CONCEPTS PER STUDY.....</b>                          | <b>65</b> |
| <b>APPENDIX 1.5: REFERENCE LIST OF TABLE 1.3.....</b>   | <b>66</b> |
| <b>REFERENCES .....</b>   | <b>74</b> |

## Introduction

The purpose of this research is to shed some light on the question whether some firms perform significantly and persistently better than others. Interest in understanding firm performance<sup>1</sup> comes from academics as well as from managers-in-the-field. As Venkatraman and Ramanujam (1986: 802) note, many theories in strategic management stress performance implications, while most empirical strategy studies analyze various strategy content and process topics linked with firm performance. The managerial interest in comprehending firm performance is obvious. Without exaggerating too much, these questions can be argued to form the core of strategic management.

---

<sup>1</sup>In this paper the notion of firm performance is used to describe the performance of an entity, an organization, which has the legal status of a company.

An analysis of firm performance should start by trying to formulate an adequate description of the concept of firm performance. This description of firm performance will uncover the different dimensions upon which firm performance should be evaluated.

## 1. Concept of Firm Performance

Webster's (1990: 746) defines performance as '... what is accomplished'. In this definition the concept performance has the characteristics of an outcome, a realization.

Hofer and Schendel, in: Venkatraman and Varadarajan (1986: 802) define performance as the time test of any strategy. In analogy with these definitions of performance, the performance of a firm can be defined as *the outcome of a firm's strategy*<sup>2</sup>, an assessment of how well a firm has *succeeded in reaching its objectives*. The objectives of a firm can be defined as the performance that the firm intends to realize.

### 1.1 Intended Strategy - Realized Performance

The *performance* of a firm reflects the *outcome of a firm's strategic decisions*, its *realized strategy*. Daems and Douma (1989: 19) point out that strategic decisions are always investment decisions. Ghemawat (1991: 43) demonstrates that the only few decisions of really strategic importance are its commitment-intensive decisions.<sup>3</sup> From this, one can conclude that the performance of a firm is largely dependent on the quality of the managers' irreversible decisions. Although he did not explicitly mention the irreversible character of

---

<sup>2</sup>Multiple definitions of strategy exist. For a discussion of the various dimensions of the strategy concept see for instance, Mintzberg (1987: 11-24), Hax and Majluf (1991: 2-6) and Douma (1993: 5-10).

<sup>3</sup>This point of view is confirmed by Douma (1993: 6).

strategic decisions, the main elements of this point were already recognized in 1974 by Richard Mancke (1974: 185), who said that:

'... one of the most important determinants of many firms' ex post performance is the magnitude of the successes actually realized on what are, initially, large and uncertain investments.'

To sum up, it can be concluded that *firm performance* can be defined as the *outcome, the successes realized on the firm's commitment-intensive decisions*.

As Mintzberg, in: Quinn, Mintzberg and James (1988: 14-15) points out a firm's realized strategy almost never equals exactly a firm's *intended strategy*. Here, the issue of *timing* comes in. The intended strategy incorporates the firm's plans, its *objectives* (ex ante), and has two essential characteristics: it is *formulated in advance* and it is consciously and purposefully developed. According to Daems (1996: 11) the strategy formulation-implementation-control process is a *sequential process* consisting of six phases: strategic diagnosis, strategic analysis, generation and evaluation of options, strategic decision-making, implementation and control.

The objectives are formulated in the *early* phases of the process. The firm's actual *performance* can only be recorded during the later *control* function. The firm's (ex post) performance is an indication of how well a firm has reached its objectives. From this, one can conclude that the timing issue is inherent to the core of the strategy process<sup>4</sup>.

---

<sup>4</sup>In paragraph 1.2. it will be shown that this 'timing problem' partly accounts for the confusion of how firm performance can be measured appropriately.

## 1.2. Three Levels of Strategy - Three Levels of Performance

Three conceptual hierarchical levels of strategy formulation can be distinguished:<sup>5,6</sup> the corporate, the business unit and the functional level.

According to Michael Porter *corporate strategy* addresses two kinds of questions: what the composition of the business portfolio should be and on how the corporate center should manage the portfolio of business units. He (1987: 43) defines corporate strategy as:

'... what makes the corporate whole add up to more than the sum of its business unit parts.'

The *business unit strategy* or *competitive strategy* positions a business unit within its competitive environment. Two factors determine the position *and the performance* of a business unit in its industry:<sup>7</sup> the attractiveness of the industry and the relative advantage of the business unit vis-à-vis its competitors in the industry.<sup>8,9</sup> Vanlommel and De Brabander

---

<sup>5</sup>These conceptual levels are already widely recognized for a long time. See for instance, Hofer and Schendel (1978: 27), Hax and Majluf (1991: 4-5), Grant (1991: 21), Johnson and Scholes (1993: 11) and Douma (1993: 10-12).

<sup>6</sup>The three level hierarchical framework is not necessarily corresponding to the actual organizational structure.

<sup>7</sup>Multiple definitions of an industry exist. For instance, Porter (1980: 5), Day (1984: 75-76) and Hax and Majluf (1991: 36) define an industry as '... the group of firms producing *products* which are close *substitutes* for each other.'

Daems and Douma (1989: 68) and Douma (1993: 55), emphasis added, determine the boundaries of an industry by grouping the firms which produce similar *products* from the user's perspective, on the basis of a comparable *technology*, adding the technology dimension.

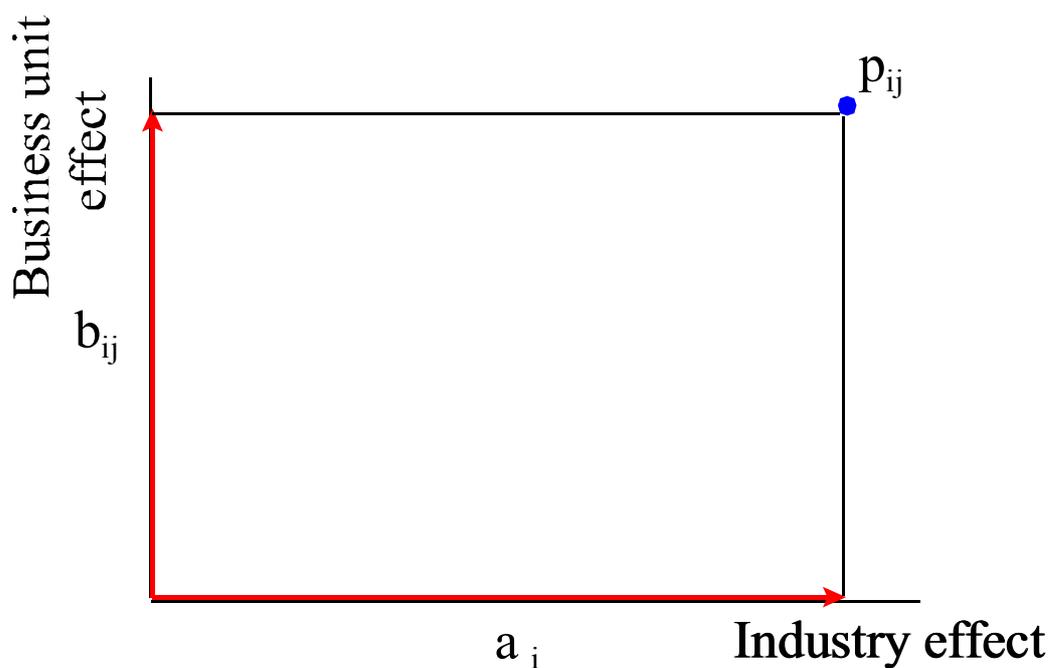
However, Porter (1985: 272) and Grant (1991: 69) note that in fact the delineation of an industry is not so important, as it is always a matter of degree and interpretation of the observer. Grant even refers to an industry as an 'artificial construct'.

<sup>8</sup>Based on these insights of Vanlommel and De Brabander (1975: 46), (1976: 471), Daems and Douma (1989: 32-35) developed an analytical tool, the 'position-matrix', to analyze the competitive strategies of the different players in an industry on these two dimensions.

<sup>9</sup>Douma (1993: 55), Grant (1991: 20) and Porter (1991: 100)

(1975: 46), (1976: 471) distinguished already in 1975 that the performance of a firm can be divided into an industry effect and a firm effect. Provided that these effects are independent, the performance of a firm at the level of an industry, a business unit, can be presented by Figure 1.1.

Figure 1.1 Performance Components



Source: Vanlommel and De Brabander (1975:46), (1976:471) and Daems and Douma (1989:36)

Hax and Majluf (1991: 409) define a *functional strategy* as:

'... a set of well-defined action programs aimed at consolidating the functional requirements demanded by the composite of businesses of the

firm, and also at developing unique competencies to exceed or at least match competitors' unique capabilities. The six major foci<sup>10</sup> for strategic functional analysis are financial strategy, human resources strategy, technology strategy, procurement strategy, manufacturing strategy, and marketing strategy.'

The outcomes of each of these strategies should be evaluated.

Due to the lack of correspondence between the definitions of firm performance in the literature,<sup>11</sup> in this paper, specific definitions are formulated. To minimize the risk of confusion, the concepts *corporate performance*, *business unit performance* and *functional performance* are introduced, each concept corresponding to its distinctive level of aggregation<sup>12</sup>.

### 1.3. Scope of Firm Objectives - Scope of Firm Performance

According to Jegers (1987: I.1) the concept of firm performance is clearly multidimensional.

Venkatraman and Ramanujam (1986: 803) distinguish three 'domains' for the concept firm performance, defined by the breadth of the concept. The narrowest concept is *financial*

---

<sup>10</sup>A functional strategy can be formulated for each of the activities of the value chain of a business unit. The value chain is a concept developed by Porter (1985: 37) to decompose the operations of a firm into its basic activities. A firm is seen as a collection of interrelated, linked activities that form the input-output process of a firm.

<sup>11</sup>In the literature there is no agreement on how to define firm performance. For instance, Wernerfelt and Montgomery (1988: 247) define firm performance as corporate performance. In contrast, Hatten and Schendel (1977: 97) determine firm performance at the business unit level, at the level of the industry. Numerous other examples can be cited.

<sup>12</sup>Also the concept *firm performance* retains its meaning in this paper. Firm performance refers to the performance of a *company*, regardless whether this company is a single-unit or a multi-business firm. In a multi-business company, firm performance will equal corporate performance. In a single-unit firm, with a functional organizational structure, only the business-unit level and the functional level are required. In this case, firm performance will be equivalent to business-unit performance. Wherever possible however, the more specific - strategy level related - performance concepts are used.

*performance*. This approach is presumed to reflect the realization of the *economic goals* of the firm. It assumes the dominance and the legitimacy of the financial goals and focuses on the interests of the firm's *shareholders*, according to Venkatraman and Ramanujam (1986: 804).

A broader conceptualization of firm performance, presented by Venkatraman and Ramanujam (1986: 804) *includes operational performance*. Operational performance refers to nonfinancial value indicators of performance. By paying attention to operational performance as well as to financial performance, insights are gained in the quality of the major operational transformations.<sup>13</sup>

This second conceptualization can be defined as the efficiency of the transformation of inputs into outputs. As operational performance is focussing on input-output transformations, a clear link exists with the activities of the firm and the notion of the value chain, a well-known concept in strategic management, introduced by Porter (1985: 37).

However, Scherer and Ross (1990: 4) and Krijnen, in: Douma (1993: 38) note, maximizing financial and operational performance is not the only aim of a firm. Every firm has multiple objectives and these goals are not always completely consistent. Chakravarthy (1986: 447, emphasis added) summarizes it as follows:

'... A truly excellent firm must [...] balance the competing claims of its various [...] *stakeholders*, in order to ensure their continuing cooperation.'

---

<sup>13</sup>Venkatraman and Ramanujam (1986: 804) define this second conceptualization, the domain of financial and operational performance, as 'business performance'. To minimize the risk of conceptual mix-up of terminology, the use of 'business performance', which sounds similar to 'business-unit performance' and even 'firm performance', two concepts which were strictly defined earlier, will be avoided throughout the text.

This balancing of priorities can be a very complicated task, argues Grant (1991: 16-17). Krijnen, in: Douma (1993: 41) however structures the objectives of the multiple stakeholders in a hierarchical scheme. At the top of the hierarchy is the long term survival of the firm, which can be decomposed in two main categories: the social function and goals and the economic goals of the firm.

When the multiple organizational goals and the influence of multiple stakeholders are considered, Venkatraman and Ramanujam (1986: 804) circumscribe this with a third, the broadest, concept of firm performance, namely *organizational effectiveness*.

Therefore, depending on the level of analysis - corporate, business unit or functional - and depending on the scope of the organizational objectives one wants to consider - financial-shareholder oriented, financial and operational oriented or multiple stakeholder oriented - several conceptualizations of firm performance can be defined. The concept which ought to be chosen in a particular research setting will be determined by the specific research questions.

## 2. Traditional Measurement of Firm Performance

As multiple concepts of firm performance can be defined, depending on the level of aggregation and the difference in dimensionality, it should not be surprising that multiple measures of firm performance are found in the empirical literature to operationalize these concepts. The appropriate measures<sup>14</sup> of performance depend on the performance concept selected.

However, as Grant (1991: 17) and also Krijnen, in: Douma (1993: 38) note, all stakeholders have a *shared interest*, namely the survival of the firm, mentions Grant (1991: 17). To survive, a firm needs to earn in the long term a rate of return that covers its cost of capital, Grant (1991: 17) concludes. As this is a financially oriented criterion, one can argue that in the end the interest of every stakeholder is linked to the financial well-being of the firm.

The previous categorization of performance concepts<sup>15</sup> will be helpful in giving an overview of the usage of different performance measures in the empirical research, to operationalize the multiple performance concepts. The classification will also prove useful in discussing the validity of the numerous performance measures.

To assess the usage of the different performance measures, a database was constructed containing 215 empirical studies concerning performance related topics. To be included in the review set a study should at least contain one performance related dependent variable, measuring a performance concept in its broadest sense.

---

<sup>14</sup>Useful, appropriate measures of performance are necessary to help distinguishing good performing firms from less well performing ones, i.e. to be able to analyze in an adequate way performance differences.

<sup>15</sup>From hereon, the focus will be at the analysis of the performance at the firm level. This implies that in essence only two levels of aggregation are studied, the corporate and the business unit level. The assessment of functional strategies will be considered to fall out of the scope of this paper. At each of the two remaining levels of aggregation, financial performance, operational performance and organizational performance can be analyzed, although the sources of information can vary, e.g. primary versus secondary information.

The selection of the studies started from Jegers' collection which he included in his literature review on the usage of performance measures<sup>16</sup>. He (1987: I.1) picked a rather randomly selected set of about 130 studies, which he supplemented with additional surveys which were reviewed by Weiss. It was decided only to withhold the set of studies which Jegers personally reviewed.

After tracing back each of his references, a list of 109 studies could be constructed. From this collection one additional study, a survey from Bain (1972: 227), had to be removed to avoid double-counting, because this paper is in essence a reprint from an article which appeared earlier in the Quarterly Journal of Economics (1951: 293-324) and which was also included in the review set. From this list of 108 references, another 8 references had to be deleted, because they could not be located in a library which is currently linked to the LIBIS-network for books and the Antilope catalogue for periodicals<sup>17</sup>. Finally, 3 references were not consulted because they are only available in LIBIS-linked libraries which were not in the vicinity of Leuven.<sup>18</sup>

This series of 97 studies was *supplemented by 116 additional published* surveys on performance related issues. This extension makes it possible on the one hand to cover a longer time period in the empirical literature, from 1951 till 1993, on the other hand it also deepens the insights in the research focus and the apparent shifts in research topics during

---

<sup>16</sup>By starting by Jegers' selection a partial reliability check of the categorization of the performance measures is obtained. Unfortunately, the reliability check is only partial for two reasons. On the one hand, Jegers decided not to analyze the level of aggregation at which the measures were obtained. On the other hand, not every study of Jegers' collection could be traced back.

<sup>17</sup>These references consist of four books, one unpublished doctoral dissertation, one conference paper and two working papers.

<sup>18</sup>No attempt was made to get access to other (international) library systems to search for the missing references. It was decided that probably more information could be collected and insights could be gained by personally updating the reference list with more recent studies until 1993 than by putting too much effort in wanting to reconstruct Jegers' original 'random' selection.

the time frame under study. Finally, it was decided to add 2 unpublished doctoral dissertations on performance related topics to the reference list: the dissertations of Jegers (1987) and Martens (1988: 403).

From the 215 studies identified, 187 appeared in 44 different academic journals, while 10 studies were published in books. Also 9 books, 7 working papers and 2 unpublished doctoral dissertations were included. A table containing the sources of the references can be found in Appendix 1.1. The complete list is added in the references as Appendix 1.5.

One study was published before 1960. Eight surveys appeared in the 1960s. No less than 73 references date from the 1970s, while 98 were published in the 1980s. The number of studies from 1990 onwards already reaches 32. The remaining three references correspond to forthcoming publications. Appendix 1.2 shows a chronological plot of the number of selected references in the review set.

For each study, information was gathered on the characteristics of the dataset that was analyzed, the different methodologies that were applied and the performance measures that were defined<sup>19</sup>.

---

<sup>19</sup>As Jegers classified each of the performance measures he found into different, sometimes rather broad categories, without leaving a trace towards the exact definition and operationalization of each measure, every study had to be looked up again. Although this was a time consuming job, it was decided to perform this task to its fullest extent.

On the one hand, this search allowed to gather with minimal extra effort more information than only the usage of the performance measures as they were described by Jegers. This information proved to be valuable while discussing the questions whether there appears to be empirical evidence that significant performance differences exist in practice, see Vandingenen (1993).

This review also was helpful for detecting the differences in research traditions in different fields and the shifts in research approaches over time. These insights show clear parallels with the various theories on why performance differences can exist according to scholars in several domains. Moreover, it is fascinating to discover how the insights in strategic management have deepened by drawing on all these research traditions. These topics are further discussed in Vandingenen and Bostyn (2003-2004b).

Every dataset was described by its datasources, its number of observations and the industry(ies), the timeperiod(s) under investigation and the country(ies) of origin of the data. The level of analysis, corporate, business unit or functional and the methodology(ies) which were used, were noted. The exact definition and the measurement of each performance related dependent variable was signed up. Whenever available, descriptive statistics of the performance measures were recorded as well.

Apparently most of the studies (173) examine manufacturing or industrial firms and industries exclusively. Twenty-two studies analyze industrial as well as service oriented firms and industries. Only 8 studies focus on services<sup>20</sup>.

From this set of empirical studies, only 1 study could rely on *internal company data*, 198 surveys applied secondary sources<sup>21</sup>. Table 1.1 presents an overview of the secondary data sources employed.

In total 287 references to a secondary datasource were found. The most popular information sources appear to be the (inter)-governmental ones. In almost 40% of the cases these data sources were consulted. This category groups the datasets from e.g. the census bureaus, the central banks, the departments of trade and industry and the internal revenue services.

Also the commercial information sources are frequently used. They represent 30% of the total number of sources and consist of for instance, the Compustat-datatapes, the directories of Standard & Poor's, Fortune, Moody's and Dunn & Bradstreet.

---

<sup>20</sup>These figures do not add up to 215 because the exact contents of each dataset was not always described in the studies, for 12 surveys the type of industries studied was not explicitly mentioned.

<sup>21</sup>These figures do not add up to 215 because 16 studies failed to mention the origin of the datasource.

A third group of sources of some significance are of course the databases constructed at universities and research centers, complemented with the primary and secondary sources of survey data. All together this category represents 15% of the total number of secondary sources found.

Perhaps somewhat surprisingly, only in a minor part of the studies data were gathered from industry associations and the firm's annual reports. Several explanations can be suggested for this observation.

First, not every study relies on individual firm data. Second, industry associations gather data, sometimes on a confidential basis, for their individual member firms. Therefore, these institutions are frequently reluctant to give access to their datasets for the purpose of academic research from which the results will be made publicly available. Finally, the infrequent use of data from annual reports may be partly explained by the fact that these data are not (always) supplied in a standardized, easily comparable format, which makes the construction of these types of datasets an burdensome and time-consuming undertaking.

In the studies data were analyzed for a time period ranging from 1926 till 1990. Of the 215 studies, 22 analyzed data prior to the 1950s, 134 studied the 1960s, 134 investigated the 1970s, 56 analyzed data from the 1980s and 2 surveys explored data from 1990.<sup>22,23</sup>

---

<sup>22</sup>It should be noted that the sum of these numbers exceed the total number of research studies under review. This is due to the fact that frequently in one study data from different time periods are analyzed.



Table 1.1: Overview of Secondary Sources

| <b>I. (INTER)-GOVERNMENTAL INSTITUTIONS</b>              |            | <b>II. SCIENTIFIC RESEARCH CENTERS</b>                           |           | <b>III. OTHER SOURCES</b>                    |            |
|--|------------|--|-----------|--|------------|
| <i>I.1. Central Banks and Financial Institutions</i>     |            | <i>II.1. University Databases</i>                                |           | <i>III.1. Commercial Information Sources</i> |            |
| . Central Banks  | 10         | . Cambridge University   | 2         | . Standard & Poor's and Compustat            | 38         |
| . Other  | 2          | . London Business School   | 1         | . Moody's                                    | 7          |
| <i>Total</i>   | 12         | . University of Edinburgh  | 1         | . Fortune                                    | 22         |
| <i>I.2. Governmental Census Bureaus and Institutions</i> |            | <i>Total</i>   | 4         | . Wall Street Journal                        | 3          |
| . Census of Manufacturers                                | 26         | <i>II.2. Research Centers</i>                                    |           | . Times                                      | 3          |
| . Other Census Bureaus                                   | 24         | . Strategic Planning Institute                                   | 5         | . McGraw Hill                                | 3          |
| . FTC Data   | 11         | . Centers for Research in Stock Prices                           | 3         | . Advertising Age                            | 4          |
| . Other Departments of Trade                             | 10         | <i>Total</i>   | 8         | . Other                                      | 5          |
| . Department of Labor                                    | 3          | <i>II.3. Primary Datasets from Original Academic Research</i>    |           | <i>Total</i>                                 | 85         |
| . Internal Revenue Service                               | 11         | . Interviews   | 4         | <i>III.2. Industry Associations</i>          |            |
| . Input-Output Tables                                    | 10         | . Other survey data  | 6         | . IMS  | 4          |
| <i>Total</i>   | 95         | . Unpublished Doctoral Dissertation                              | 4         | . IATA                                       | 1          |
| <i>I.3. Securities Exchange Commission</i>               |            | <i>Total</i>   | 14        | . Other                                      | 5          |
| . SEC  | 4          | <i>II.4. Secondary Datasets from Published Academic Research</i> |           | <i>Total</i>                                 | 10         |
| . STATEX   | 1          | . Shepherd   | 5         | <i>III.3. Company Annual Reports</i>         | 14         |
| <i>Total</i>   | 5          | . Other Academic Research  | 11        | <i>III.4. Miscellaneous</i>                  | 24         |
|  |            | <i>Total</i>   | 16        |  |            |
| <b>TOTAL I</b>   | <b>112</b> | <b>TOTAL II</b>  | <b>42</b> | <b>TOTAL III</b>                             | <b>133</b> |
| <b>TOTAL NUMBER OF SECONDARY SOURCES SPECIFIED</b>       |            |  |           |  | <b>287</b> |
|  |            | <b>IV. Not specified</b>   | <b>16</b> |  |            |

Source: 215 empirical research studies in reference list

Although 123 surveys examined U.S. data, in total data from a quite broad part of the industrialized countries were analyzed. To correct somewhat for the overrepresentation of U.S. based studies, it was tried to at least achieve a balance between the number of studies analyzing data from European and from North American origin<sup>24</sup>. Altogether data were examined from no less than 26 different countries. Table 1.2 lists the number of studies according to the countr(y)(ies) of origin of the data.<sup>25</sup>

Table 1.2: Frequency of Country of Origin of Data

| EUROPE                    |            | NORTH AMERICA |                         | OTHER COUNTRIES      |                    |
|---------------------------|------------|---------------|-------------------------|----------------------|--------------------|
| <i>European Community</i> |            |               |                         | <i>Far East</i>      |                    |
| . Belgium                 | 28         | . U.S.        | 123                     | . Japan              | 9                  |
| . The Netherlands         | 13         | . Canada      | 12                      | . Hong Kong          | 1                  |
| . Luxembourg              | 4          |               |                         | . Taiwan             | 1                  |
| . France                  | 20         |               |                         | . South Korea        | 1                  |
| . Germany                 | 16         |               |                         | . Singapore          | 1                  |
| . United Kingdom          | 34         |               |                         |                      |                    |
| . Ireland                 | 1          |               |                         | <i>Oceania</i>       |                    |
| . Italy                   | 10         |               |                         | . Australia          | 5                  |
| . Spain                   | 5          |               |                         | . New Zealand        | 1                  |
|                           |            | 131           |                         |                      |                    |
| <i>E.F.T.A.</i>           |            |               |                         | <i>Africa</i>        |                    |
| . Sweden                  | 3          |               |                         | . South Africa       | 2                  |
| . Norway                  | 1          |               |                         | . Kenya              | 1                  |
| . Switzerland             | 1          |               |                         |                      |                    |
|                           |            | 5             |                         | <i>South America</i> |                    |
| E.C. and E.F.T.A.         | 1          |               |                         | . Brazil             | 1                  |
| 'European Firms'          |            |               |                         | . Chile              | 1                  |
| not explicitly specified  | 1          |               |                         | . Argentina          | 1                  |
| <b>TOTAL EUROPE</b>       |            | <b>138</b>    | <b>TOTAL N. AMERICA</b> | <b>135</b>           | <b>TOTAL OTHER</b> |
| <b>TOTAL</b>              | <b>298</b> |               |                         | <b>25</b>            |                    |

Source: 215 empirical research studies in reference list

<sup>24</sup>Europe is defined here as the 12 member states of the European Community plus the 6 E.F.T.A. countries.

<sup>25</sup>As some studies analyze data from several countries, the total number exceeds the total of 215.

Of the 215 studies, 46 analyzed performance issues at the corporate level, while 168 surveys investigated performance related topics at the industry or the business unit level. The review set contains no surveys where the level of analysis is a functional activity, although operational measures are regularly used. These operational measures are calculated for the firm as a whole, not explicitly for each separate activity.<sup>26,27</sup>

Reviewing the set of references, in total 401 separate measurements of different performance concepts were found. Appendix 1.3 pictures a chronological plot of the number of performance concepts measured<sup>28</sup>.

The review of the 215 empirical surveys also reflects the multiple dimensionality of the performance concept. On the one hand, Appendix 1.4 combines the information of appendices 1.2 and 1.3 by showing the number of concepts measured per study across time. This picture shows that on average more than one conceptualization of the performance concept is measured.

On the other hand, the multiple dimensionality of the performance concept is shown in Table 1.3, which reflects the frequency of the concepts measured for the whole reference set<sup>29</sup>. In Table 1.3 the discovered performance measures were classified according to the level of analysis under investigation, corporate or business unit level, and according to the breadth of the scope of the related performance concept, based on the framework of Venkatraman en Ramanujam.

---

<sup>26</sup>Of course, a lot of these operational measures are clearly linked to a specific activity. However, if one considers the research questions in these particular studies, one notes that the research interest is in the performance of the firm as a whole and not as much on the single activity, see *infra* paragraph 2.2.

<sup>27</sup>For one study it was not clear at which level of aggregation the data were collected.

<sup>28</sup>The actual number of performance measures is somewhat higher, because in a single study a certain concept can be measured with multiple measures, see *infra* Table 1.3 footnote no. 32

<sup>29</sup>Appendix 1.5 contains the list of references which measure a particular performance concept.

The overall picture in Table 1.3 is clear<sup>30</sup>. Financial performance concepts and measures<sup>31</sup> dominate the empirical research both at the corporate and at the business unit level. Jegers (1987: 1.4) attributes this dominance mainly to the availability of the data. However, regarding the fact that eventually every stakeholder's interest is related to the financial prosperity of the firm, this supremacy of the financially related concepts and measures is not so surprising. Due to this dominance, the discussion of the validity of the different available measures of performance starts with an in-depth discussion of the validity of financial performance measures.

## 2.1 Financial Performance Measures

Fisher and McGowan (1983: 82) argue that provided it is corrected for risk, the economic rate of return is the only correct measure for economic analysis. The question then becomes whether valid measures can be defined which are yielding information as to the economic rate of return.

Jegers (1987: 1.5) points out that most of the authors he reviewed determine this economic rate of return as equal to the internal rate of return. Fisher and McGowan (1983: 82, emphasis added), say that:

'... The economic rate of return is, *of course*, that discount rate that equates the present value of its expected net revenue stream to its initial outlay.'

---

<sup>30</sup>The results of Table 1.3 will be discussed more in detail, when the validity of the different types of performance measures is analyzed.

<sup>31</sup>Within the category of financial performance concepts, a distinction is made between accounting based and market based performance concepts. This dichotomy is motivated by Schmalensee's categorization of financial performance measures, see *infra* paragraph 1.2.1.

This preference for the internal rate of return is not astonishing, it is directly related to the requirement that for the appraisal of investment opportunities a consideration of the *timeframe* is needed.

Usually two time-discounted procedures are proposed: the net present value criterion and the internal rate of return. Although Levy and Sarnat (1990: 68-81) pose that the *optimal decision rule* is the maximization of the present value of the firm, the internal rate of return criterion appears to be more appealing to managers. Levy and Sarnat (1990: 90) explain this inconsistency as follows, they argue:

'... The popularity of the IRR is in part psychological; a measure of investment worth which is set out in a valid consideration is appealing to many executives. The rate of return can readily be compared with the cost of funds to yield a 'margin of profit'. This is a valid consideration and much can be said in favor of *presenting* the results of a feasibility study in a form which is preferred by management, that is in terms of the IRR. '

Table 1.3: Frequency of Measured Performance Concepts<sup>32</sup>

**CORPORATE LEVEL**

| FINANCIAL BASED CONCEPTS        |         | OPERATIONAL CONCEPTS           |         | ORGANIZATIONAL CONCEPTS         |         |
|---------------------------------|---------|--------------------------------|---------|---------------------------------|---------|
| ACCOUNTING BASED CONCEPTS       |         | MARKET BASED CONCEPTS          |         |                                 |         |
| Definition                      | Studies | Definition                     | Studies | Definition                      | Studies |
| <i>. Profitability</i>          |         | <i>. Market Based Concepts</i> |         | <i>. Operations</i>             |         |
| * Return on Equity              | 18      | * Tobin's Q                    | 1       | * Value Added                   | 1       |
| * Return on Investment          | 5       | * Marris V                     | 2       | * Productivity                  | 1       |
| * Return on Assets              | 25      | * Market Value                 | 2       |                                 |         |
| * Return on Sales               | 1       | * Stock Price                  | 4       | <i>. Marketing &amp; Sales</i>  |         |
| * Price Cost Margin             | 3       | * Other Market Based Concepts  | 3       | * Growth of Sales               | 7       |
| * Profit Level                  | 2       |                                |         | <i>. Firm Infrastructure</i>    |         |
| * Growth in Profits             | 2       |                                |         | * Growth of Assets              | 5       |
| * Growth in Earnings Per Share  | 1       |                                |         | * Asset Turnover                | 1       |
| <i>. Autofinancing Capacity</i> |         |                                |         | <i>. Technology Development</i> |         |
| * Cashflow                      | 2       |                                |         | * R&D                           | 2       |
| * Cashflow/Equity               | 1       |                                |         |                                 |         |
| * Cashflow/Total Assets         | 2       |                                |         |                                 |         |
| * Cashflow/Sales                | 3       |                                |         |                                 |         |
| * Earnings Retention Rate       | 1       |                                |         |                                 |         |
| TOTAL ACCOUNTING BASED          | 66      | TOTAL MARKET BASED             | 12      | TOTAL OPERATIONAL               | 17      |
| TOTAL FINANCIAL BASED           | 78      |                                |         | TOTAL ORGANIZATIONAL            | 2       |
| TOTAL CORPORATE LEVEL           | 97      |                                |         |                                 |         |

**BUSINESS UNIT LEVEL**

| FINANCIAL BASED CONCEPTS                 |         | OPERATIONAL CONCEPTS           |         | ORGANIZATIONAL CONCEPTS         |         |
|--|---------|--------------------------------|---------|---------------------------------|---------|
| ACCOUNTING BASED CONCEPTS                |         | MARKET BASED CONCEPTS          |         |                                 |         |
| Definition                               | Studies | Definition                     | Studies | Definition                      | Studies |
| <i>. Profitability</i>                   |         | <i>. Market Based Concepts</i> |         | <i>. Operations</i>             |         |
| * Return on Equity                       | 49      | * Tobin's Q                    | 4       | * Value Added                   | 3       |
| * Return on Investment                   | 16      | * Marris V                     | 1       | * Growth in Value Added         | 3       |
| * Return on Assets                       | 51      | * Market Value                 | 2       | * Capacity Utilization          | 4       |
| * Return on Sales                        | 20      | * Market Value/Equity          | 3       | * Productivity                  | 8       |
| * Price Cost Margin                      | 48      | * Market Value/Sales           | 2       | * Fixed Assets/Employee         | 1       |
| * Growth in Price Cost Margin            | 1       | * Stock Price                  | 4       | * Slack                         | 1       |
| * Profit Level                           | 6       | * Other Market Based Concepts  | 8       |                                 |         |
| * Growth in Profits                      | 2       |                                |         | <i>. Marketing &amp; Sales</i>  |         |
| * Relative Profits                       | 1       |                                |         | * Sales                         | 2       |
| * Growth in Earnings per Share           | 1       |                                |         | * Growth of Sales               | 10      |
| * Price above Average Cost               | 1       |                                |         | * Market Share                  | 5       |
| <i>. Autofinancing Capability</i>        |         |                                |         | * Growth of Market Share        | 1       |
| * Cashflow                               | 2       |                                |         | * Weighted Market Share         | 2       |
| * Cashflow/Equity                        | 5       |                                |         | * Advertising                   | 1       |
| * Cashflow/Total Assets                  | 7       |                                |         | * Price                         | 1       |
| * Cashflow/Sales                         | 7       |                                |         | * Other Marketing Mix Variables | 1       |
| <i>. Other Accounting Based Concepts</i> |         |                                |         | <i>. Firm Infrastructure</i>    |         |
| * Z-Factor                               | 1       |                                |         | * Growth of Assets              | 4       |
|  |         |                                |         | * Asset Turnover                | 3       |
|  |         |                                |         | <i>. Technology Development</i> |         |
|  |         |                                |         | * R&D                           | 4       |
| TOTAL ACCOUNTING BASED                   | 218     | TOTAL MARKET BASED             | 24      | TOTAL OPERATIONAL               | 54      |
| TOTAL FINANCIAL BASED                    | 242     |                                |         | TOTAL ORGANIZATIONAL            | 8       |

**TOTAL BUSINESS UNIT LEVEL 304**

Source: Performance concepts measured in the 215 empirical research studies, reclassified according to the level of analysis and the framework of Venkatraman and Ramanujam

<sup>32</sup>The table shows the *number of empirical studies* which have operationalized *at least one* dependent variable which has to be classified in a certain category. Consequently, the actual number of performance measures is somewhat higher, because in a certain study e.g. the concept 'return on assets' can be operationalized with multiple measures, e.g. the ratio of earnings before interest and taxes to total assets or e.g. the ratio of net profits to total assets. In this case, the category return on assets was only coded once. As a result the frequency table shows the number of studies which operationalize a specific concept of performance at a particular level of aggregation. Nevertheless, the total number of recordings exceeds 215 because regularly in one study different performance concepts are operationalized. For instance, one survey can contain measures of return on assets, return on equity, market based and/or operational and organizational measures.

Discounted cashflow analysis was developed to evaluate individual investment projects, in other words to test the appropriateness of multiple (mutually exclusive) commitment-intensive investment opportunities. From this, one can conclude that the discounted cash flow procedures are in essence *future-oriented* and therefore useful to guide the strategic *decision-making*, to support the *formulation of a firm's intended strategy*.

The question must nevertheless be posed whether the internal rate of return, from origin a *concept at the project level* is a valid approximation for the economic rate of return *at the firm level*. First, there are at least two important assumptions which underlie the internal rate of return concept, namely the reinvestment rate hypothesis and the unicity of the project's rate of return<sup>33</sup>. A second array of critiques can be formulated upon the frequent practice to transform the internal rate of return concept that is in essence a concept at the project level, to the level of the firm. Jegers (1987: I.6, I.7, I.11) analyzed the underlying assumptions, the restrictions and the problems which arise by this transition.

Jegers (1987: I.12) shows that *four different criteria* can be used to assess the validity of empirical measures<sup>34</sup> as proxies for the internal rate of return:

- the empirical measure or at least its expected value *ought to equal* the internal rate of return;
- the empirical measure should *allow to determine* the internal rate of return in an analytical clear way;

---

<sup>33</sup>For a further discussion see Jegers (1987: I.36-45).

<sup>34</sup>Although the notion 'empirical measures' is in the strict sense of the word broader than the description of financial measures, it is clear that in Jegers' discussion this concept is used to refer to financial measures of performance.

- the empirical measure and the internal rate of return ought to *correlate*, and consequently rank a number of firms in the same way;
- the variance of the empirical measure which is not explained by the internal rate of return may not be correlated to the explanatory variable(s); resulting from this criterion is the fact that the corresponding research findings will not have as much statistical power but that they will be unbiased by the substitution of the internal rate of return by an empirical measure.

Of course, the fact whether an empirical measure will be accepted as a valid measure of the internal rate of return will depend on the severeness of the criterion a researcher imposes. As will be seen further on, these differences in criteria will form the basis of a heated debate whether accounting rates of return can be used as proxies for the economic rate of return.

Schmalensee (1989: 960) distinguishes four basic classes of empirical measures which can be used as proxies for the internal rate of return:

- "pure" accounting rates of return;
- measures which assess '... the ability of firms to price above long term average cost';
- price cost margins;
- measures which employ the market value of a firm.

All these empirical measures rely however on accounting data, even the measures which use the market value of a firm, asserts Schmalensee (1989: 961). Therefore, the analysis will proceed with a discussion of the validity of the "pure" accounting rates of return. Afterwards, the three other classes will be examined with reference to the critiques on the accounting rates of return. As all

the measures rely more or less on accounting data, many of these critiques will also apply to the other measures.

### 2.1.1. Accounting Rates of Return

Numerous economists and accountants have already been struggling with the question whether *accounting rates of return* can be considered to be reliable proxies for the economic rate of return. An extensive amount of literature has been published on this topic. For a review until 1987 is referred to Jegers (1987: Chapter I.)

This paper addresses this important topic on the one hand by referring to a first series of no less than 12 articles on the misuse of accounting rates of return, and a second series on the validity of profits-structure studies with particular reference to the FTC's line of Business Data, which appeared in *The American Economic Review* in the periods 1983-1989 and 1985-1987 respectively.

Although these series do not refer to the first time these issues are discussed in the literature, these chains of papers were selected because they are the result of a very enriching debate, which clearly confronts the different opinions. Also, the length of the time period and the numerous authors of varying backgrounds and research traditions engaged in the debate, reflect the commitment and the interest of the academic community for this important question.

In this paper it is tried to group the different perspectives in *three viewpoints*:<sup>35,36</sup> the fatalistic, the utilitarian and the constructive view. An overview of the major grounds for these viewpoints will

---

<sup>35</sup>This classification is more or less comparable to the categorization of Scherer and Ross (1990: 421).

<sup>36</sup>The difference in focus between these perspectives can be brought back to the four different criteria Jegers distinguishes which can be used to assess the validity of empirical measures as proxies for the internal rate of return, see *supra*.

be given by discussing the argumentations of the main representatives of each of these perspectives.

#### 2.1.1.1. The Fatalistic View

The fatalistic view refers to the authors who conclude that it is *out of the question that research of any importance can be done based on accounting data*<sup>37</sup>. Representatives of this point of view are Fisher and McGowan (1983: 82-97) and Benston (1985: 37-67).

*Fisher and McGowan* (1983: 84, 91-97) present a number of theoretical arguments which demonstrate that accounting rates of return are not informative to infer anything concerning the economic rate of return. The authors (1983: 83, emphasis added) explicitly state:

'...only *by accident* will accounting rates of return be in one-to-one correspondence with economic rates of return.'

They (1983: 86) also show that the divergence between the accounting rates of return and the economic rate of return can be very substantial. Moreover, they illustrate that there are no straightforward methods available for detecting the direction and the magnitude of systematic bias. Consequently, they (1983:87) argue, no practical methods can be developed to adjust accounting rates of return to accurately reflect the economic rate of return.

Fisher and McGowan (1983: 90) conclude that:

---

<sup>37</sup>The unwillingness of the representatives of the fatalistic view to accept that accounting rates of return would contain any valuable information concerning the economic rate of return can be attributed to Jegers' first and second criteria. These criteria are very strict.

'...there is no way in which one can look at accounting rates of return and infer anything about relative economic profitability...'

and they (1983: 91) are strongly believing that:

'... Economists (and others) who believe that analysis of accounting rates of return will tell them much (if they can only overcome the various definitional problems which separate economists and accountants) are deluding themselves.'

In his reply paper Fisher (1984: 509-510) further arguments why accounting rates of return are not very informative on the economic rate of return,<sup>38</sup> namely because also the *timing* gets mixed up. The impact of the timing problem is also noticed by Jacobson (1987: 470).

Indeed, the accounting rates of return relate *current profits*, which is the result of investment decisions in the past to for instance, *current* capitalization, which can be expected to have an influence not only on past and current earnings but also on future earnings. While, the economic rate of return relates a stream of *future profits* to the investments that produce it.

Also *Benston* can be categorized as a member of the 'fatalistic' view. He shows that it is very unlikely, if not impossible, to obtain comparable accounting based performance measures *across firms*, which can be considered to be unbiased measures for the economic rate of return.

He (1985: 50) demonstrates that it is very difficult, maybe even impossible, to detect and adjust for the biases, because neither the magnitude nor the sign of all the divergences can be determined.

---

<sup>38</sup>Fisher (1984: 509-510) states: '... Only in very stringent conditions, which are very unrealistic, the accounting rates of return will equal the economic rate of return'.

This while, the impact of those divergences is likely to be very significant. This leads Benston (1985: 50) to conclude that:

'... the usefulness of the data for [...] structure-performance studies generally is, at best, doubtful.'

In a reply to the comment of Scherer and al.<sup>39</sup> on his paper, Benston suggests that he is not convinced by the arguments of these authors. He (1987: 221, emphasis added) concludes that:

'...accounting profit/sales or profit/assets is *not* a valid measure of economic profitability.'

#### 2.1.1.2. The Utilitarian View<sup>40</sup>

The utilitarian perspective groups the researchers who take a rather *pragmatic* viewpoint. Though they are well aware of the fact that accounting rates of return can be criticized on a theoretical basis, they take a rather optimistic position, *hoping* that the errors introduced by accounting practices are not systematically related to the studied concepts and relationships and that no

---

<sup>39</sup>See *infra*, on The Constructive View

<sup>40</sup>The description 'utilitarian' comes from Salamon (1985: 495).

systematic bias is introduced<sup>41</sup>. Delegates of this perspective are Long and Ravenscraft (1984: 494-500) and to a lesser extent van Breda (1984: 507-508).

*Long and Ravenscraft* argue that accounting rates of return are useful proxies for economic rates of return<sup>42</sup>. Therefore, they can be classified 'utilitarians'. Although they (1984: 499) agree that at an individual level accounting rates of return can deviate in a significant way from the economic rate of return and that measurement problems can introduce some potential for distorting particular results, they (1984: 498) argue that there is little reason to believe significant bias is introduced.

*van Breda* agrees with Fisher and McGowan that no systematic relationship can be determined between accounting rates of return and economic rate of return, unless the time shape of the benefits is known. However, in this paper van Breda is classified as a representative of the utilitarian view, because he (1984: 507) agrees that accounting rates of return can be used as *rules of thumb, hurdle rates*, provided that the firm has relatively constant time shapes of benefits and growth rates.

### 2.1.1.3. The Constructive View

---

<sup>41</sup>The belief of the utilitarian view that accounting rates of return can be used as reliable proxies is related to Jegers' third criterion.

<sup>42</sup>It should be recognized that Long and Ravenscraft (1984: 496) state that it is not necessary that accounting rates of return *equal* economic profits, as Fisher and McGowan do, but they argue that: '...it is sufficient if accounting profits are a reasonable proxy for economic profits.' This difference in emphasis can be interpreted in the light of the four different criteria Jegers distinguishes which can be used to assess the validity of empirical measures as proxies for the internal rate of return, see *supra* paragraph 2.1.

The third viewpoint gathers the authors who accept that accounting rates of return are imperfect measures for the economic rate of return, but contrary to the 'fatalistic' researchers they do not believe that these imperfect measures contain *no* information on the economic rate of return. On the other hand, they are not as optimistic as the representatives of the 'utilitarian' perspective.

The representatives of the constructive view comprehend that serious difficulties (can) exist with accounting data. They argue that the question whether using accounting rates of return as a proxy for economic rate of return will lead to biased results, depends on the fact whether the differences between accounting rates of return and economic rate of return are correlated to the variables used in the research setting. Consequently, they *try to develop methods to detect and wherever achievable, to account for systematic bias*<sup>43</sup>. Influential representatives of this third perspective are Horowitz (1984: 492-493), Jacobson (1987: 407-487), Scherer et al. (1987: 205-215), Salamon (1985: 495-504) and (1989: 290-293), Buijink and Jegers (1989: 287-289) and Steele (1993: 1-15).

*Horowitz* can be classified as a 'passive' adherent of the constructive view. He agrees that empirical data are always imperfect, but he is also convinced that those accounting data are not useless. He (1984: 493) decides that economic analysis based on accounting data is:

'... an enterprise that must be undertaken judiciously and with an awareness of the data's possible shortcomings.'

The fact that he proposes to be *sensitive* (= try to detect) to the shortcomings of the data while interpreting the research findings, *without proposing corrective actions* accounts for classifying Horowitz as a representative of the 'passive' constructive view.

---

<sup>43</sup>The constructive view can be linked to Jegers' third and fourth criterion.

Jacobson's analyses (1987: 471, 474) show that return on investment<sup>44</sup> and alternative accounting-based measures of performance are useful indicators of financial performance,<sup>45</sup> as significant correlations<sup>46</sup> between the measures and the stock return, which was selected as a measure for financial performance, are found. Hence, he (1987: 473) points out that accounting rates of return contain information as to the economic rate of return and also contain valuable information of the occurrence of supra and infra normal profitability.

Although this seems to portray a statement of a representative of the 'utilitarian' view, in this paper it is argued that Jacobson can better be categorized as an agent of the *passive constructive* view. This because Jacobson (1987: 471) goes *further than simply accepting accounting rates of return as useful proxies for the economic rate of return*.

First, he acknowledges that the return on investment measure suffers from serious limitations. Second, he evaluates whether there is reason to believe that the return on investment is a biased estimator. As this apparently seems to be the case, he also tries to *assess the importance* of the bias. He (1987: 472) concludes that:

'... while ROI is a biased estimate of stock return, the bias may be limited to a constant understatement.'

---

<sup>44</sup>In this study, return on investment is defined as the ratio of net income to assets.

<sup>45</sup>Jacobson uses the concept 'business performance'. However, he states that the objective of his research is to evaluate the validity of return on investment as a measure of the economic rate of return. It is therefore clear that he uses the business performance concept in the meaning of the notion of 'financial performance' in this paper. This is once again, an example of the fact that different authors use the same label for different concepts and vice versa, see supra paragraph 1.2.

<sup>46</sup>Jacobson's assessment of the validity of return on investment as a measure for financial performance corresponds to Jegers' third criterion.

*Scherer et al.* comment on Benston's paper. They take a rather *active constructive* viewpoint. They (1987: 210) agree that the selection of the accounting methods can distort reported profit figures. However, they strongly believe that both the magnitude of the distorting effects and the systematic bias they may introduce in the estimates *can be analyzed and can be (partly) controlled for*. They seem convinced, although they welcome more research, that after controlling for these distortions, the main relationships will persist.

*Salamon* takes an even *more active approach*. He (1985: 498) develops procedures to estimate rates of return, from which some sources of measurement error which contaminate the accounting rates of return are removed.<sup>47</sup> These 'conditional rates' of return as *Salamon* labels them, are used to shed some light on the debate between Fisher and McGowan<sup>48</sup> (fatalistic view) on the one hand and Long and Ravenscraft<sup>49</sup> (utilitarian view) on the other hand.

The findings of *Salamon's* paper (1985: 503) suggest that systematic measurement errors are present in some types of research (e.g. relationship between firm performance and firm size) while the accounting rates of return seem to contain only random measurement error in other settings (e.g. concentration and advertising intensity studies).

*Buijink and Jegers* (1989: 288) succeed in correcting *Salamon's* procedures for estimating the conditional rates of return, so contributing in a 'constructive' way to the development of theoretically less contaminated performance measures. *Salamon* (1989: 291-292) replicates his study,

---

<sup>47</sup>With his approach *Salamon* adheres the requirement of *Jegers'* fourth criterion for assessing the validity of financial performance measures.

<sup>48</sup>These authors seem to defend the view that the error in the accounting rates of return are likely to be systematic, see paragraph 1.2.

<sup>49</sup>These researchers seem to believe that most of the measurement error is likely to be random most of the time and that therefore accounting rates of return can be used as unbiased proxies for the economic rate of return.

this time using the corrected formulas suggested by Buijink and Jegers. His previous results remain mainly unaffected.

The value added of Salamon's procedure is that he indeed succeeds in expanding the insights on the debate between 'fatalists' and 'utilitarians', while also offering a methodology<sup>50</sup> to evaluate the usefulness of accounting data in several other research settings.

Also *Steele* can be considered as an *active constructivist*. He (1993: 3) points out that if one has no insights in the cashflow patterns, a 'pseudo internal rate of return' can be calculated from accounting data. This pseudo internal rate of return which is the solution of an iterative convergent process, is in essence an average accounting rate of return.

The existence of such a pseudo internal rate of return rests on two assumptions. On the one hand it implies that the economic rate of return is unique. On the other hand, it requires that the economic rate of return falls in the range  $[-99\% ; +\infty]$ . Although in theory violations of these assumptions are possible, *Steele* (1993: 3) argues that in reality, these are not too stringent.

Based on this discovery, he succeeds in developing an analytical relationship between this pseudo internal rate of return and the economic rate of return,<sup>51</sup> by discovering conditional bounds on the size of the error between the pseudo internal rate of return and the economic rate of return.

These boundaries on the size of the error however *only* depend on the optimal number of time periods for estimating the economic return from accounting data.

---

<sup>50</sup>Also other authors have tried to offer 'constructive' ways to deal with the problems. Not all these authors were successful. *Anthony* (1986: 244-246) for instance, proposed a way to diminish the discrepancy between accounting rates of return and the economic rate of return by suggesting two changes in accounting principles. However, *Awerbuch* (1988: 581-587) pointed out that *Anthony's* propositions will do little to bring accounting rates of return in closer correspondence to the economic rate of return.

<sup>51</sup>This finding corresponds rather closely to *Jegers'* second criterion.

For the derivation of these bounds one does not need insights on the pattern of the cashflows, nor on the accounting measurement system which is used. This finding should be compared to the conclusions of Fisher and McGowan who claim that unless the time shape of the cashflows, the growth rate of the firm and the depreciation method are known, it is impossible to derive strong properties on the economic rate of return. They (1983: 84) assert that:

'... The only reliable inferences conceding the economic rate of return that can be drawn [...] from examination of the accounting rate of return stem from the fact that the accounting rate of return and the economic rate of return will be on the same side of the firm's exponential growth rate. If the accounting rate of return is higher than the growth rate, then the economic rate of return is also higher than the growth rate. If the accounting rate of return is lower than the growth rate, then the economic rate of return is lower than the growth rate. If the accounting rate of return equals the growth rate, and in this case *alone*, the economic rate of return is guaranteed to be equal to the accounting rate of return.'

Although the accompanying empirical evidence shows that the analytical derived bounds are broad, probably too broad to be of direct practical use, Steele's findings represent an important step forward.

Steele also develops an analytical relationship for the single period case. He (1993: 10-11) shows that the economic rate of return is a weighted average of the single period accounting rate of return and the rate of growth of goodwill. The weight is defined as the ratio of the book value of equity at the beginning of a period to the market value of equity, while the growth in goodwill is

defined as the relative change in the difference between the economic value of the assets and the accounting book value of equity during the period under consideration.

Also this relationship holds for any system of accounting valuation rules. Although further analysis is required, there is no doubt also this single period analysis represents an important theoretical contribution to the understanding of how accounting rates of return relate to the economic rate of return.

In his reply paper *even Fisher* seems to give some merit to the constructive viewpoints. As he (1984: 513) acknowledges that accounting rates of return and the economic rate of return are correlated although the exact size of the correlation is not known, he agrees that if the differences between accounting rates of return and the economic rate of return are not correlated to the variables used in the study, accounting rates of return can be used as valid proxies for economic rate of return. *But Fisher remains cautious*, he argues that very detailed analyses are needed to make sure that this condition is satisfied. He (1984: 513) therefore concludes that:

'... Only very detailed investigations can rescue the accounting rate of return and the studies based on it.'

Although in the previous discussion the likely significant impact of *measurement errors* was already pointed out several times, the *sources* of these biases have not yet been discussed. An in-depth discussion of the several reasons for the divergences is however considered to fall out of the scope of this research. To get some feeling with the most important sources of concern, one can for instance, consult Benston (1985: 41-50), Chakravarthy (1986: 443) or McGuire, Schneeweis and Hill (1986: 129-136).

*This rather extensive review of the three different conceptual perspectives and their reference to and assessment of the possible impact of measurement errors serves as a basis to form a founded opinion on the debate whether accounting rates of return can be used as proxies for the economic rate of return.*

According to us, *the fatalistic view is too narrowly focused*. It argues that as the accounting rates of return are such imperfect measures of the economic rate of return, they in essence contain no valuable information and that therefore their usage should be rejected. The underlying assumption, that a valid measure of firm performance based on accounting data should equal the economic rate of return or at least that an analytical relationship should exist which would allow to determine the economic rate of return, is too strict. Certainly, as Salamon (1985: 495) already noted, if the internal rate of return would be unequivocally known, there would remain no need to rely on other (less perfect) accounting rates of return.

Also purely relying on *the utilitarian view is questionable*. This perspective is only defensible as long as it can be reasonably accepted that the measurement errors contained in accounting rates of return are randomly distributed. As Salamon (1985: 503) already proved, there is reason to believe that this is not always the case.

On these grounds the *only defensible* perspective seems to be *the constructive view*. As accounting data are the only source of data which are available on a widespread basis, it seems that the only thing a researcher can do is to take a relatively pragmatic position and use these accounting data, concludes Jegers (1987: 1.48). However, this does not mean that one should blindly follow the utilitarian view.

Salamon indicated that in some research settings the impact of measurement errors is important. Therefore, an *'active' constructive view* is needed. Wherever possible and economically feasible,

empirical researchers should be pushed to 'filter out' the impact of contaminating influences. Meanwhile, more research should be done to develop more profound theoretical procedures to discover and to narrow the boundaries on the errors, while also detecting the impact of and correcting for its influences. Therefore, theoretical contributions as those from Salamon and Steele should be applauded.

Nevertheless, as Benston (1985: 37-67) already showed, it is *not easy and not always possible* to detect the direction of and the resulting impact of distorting influences. In this case, the researcher cannot do much more than to take a *'passive constructive position'*. He should then remain *sensitive* to the possible impact of contaminating influences, while interpreting his results. One thing a researcher could do to assess the validity of his findings is specifying several measures of performance, from which the impact of contaminating influences is filtered out as much as possible, while also defining several alternative methods to estimate the relationships under study. This suggestion draws directly upon the in empirical research frequently used 'multitrait-multimethod' methodological design, presented by Campbell and Fiske (1959: 81-105).

From this discussion, according to us, it is clear that accounting rates of return and therefore accounting data are not useless to assess the economic performance of a firm. However, one should be careful, while using these data. Therefore, we advocate that a constructive view should be applied and we agree with Fisher (1984: 514) that detailed investigations are needed to minimize the risk that contaminating influences would lead to biased estimates and from thereon to faulty conclusions.

The review of the 215 selected studies, described in Table 1.3, already showed that accounting rates of return, by far dominate the empirical research. At the corporate level, 66 separate measurements of different accounting based performance concepts were found, compared to a

total of 97, in 46 studies analyzing performance related topics at this level. Most popular are measures operationalizing return on assets and return on equity.

At the level of the business unit 218 distinct measurements of accounting based performance concepts were found, compared to a total of 304, in 168 studies analyzing issues at this level. Again rate of return on assets and return on equity are favored, directly followed by price cost margins, see paragraph 2.1.3.

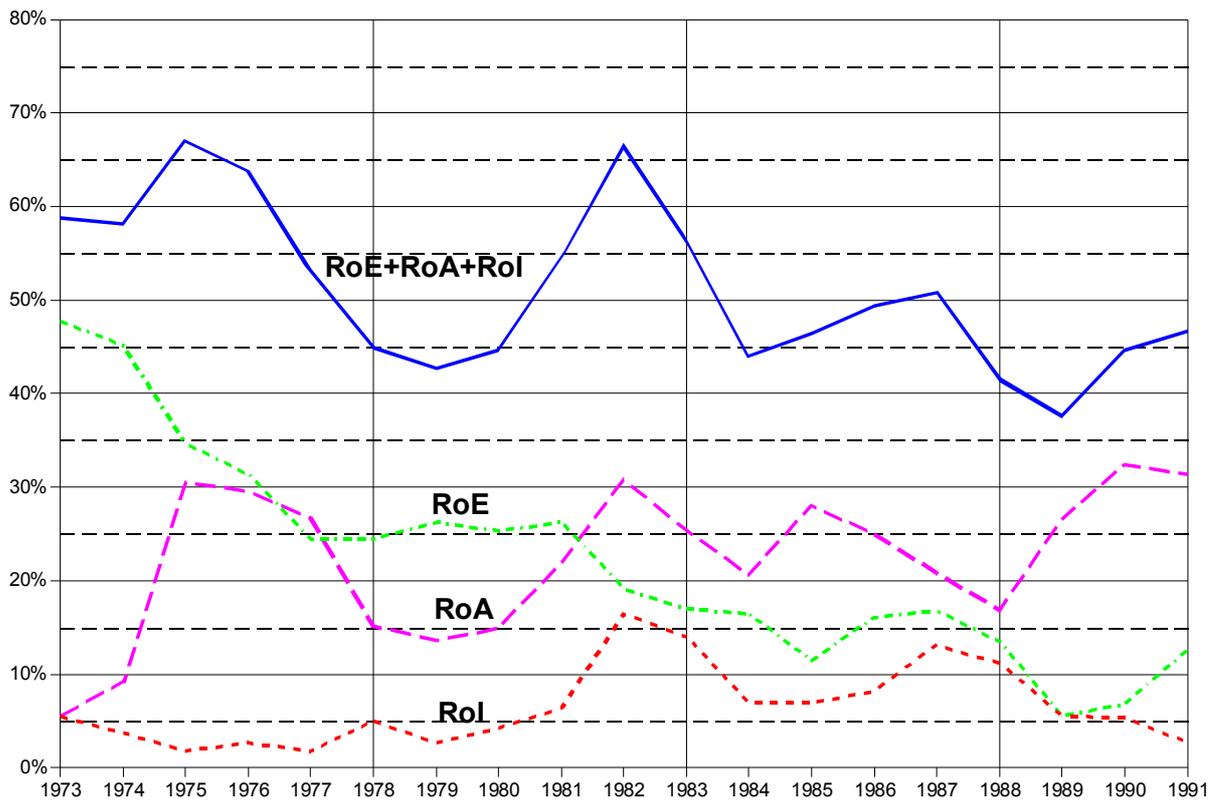
Figure 1.2 shows the relative use of the most popular ‘pure’ accounting rates of return: return on equity, return on investment and return on assets. The horizontal axis indicates the year of publication of the surveys. The vertical axis shows the relative occurrence of a particular (group of) measure(s) compared to the total number of financial based performance concepts. It was decided to refer to the total number of financially oriented concepts instead of to the number of accounting based ones because in essence both accounting based as the market based ones measure the financial performance of a firm. The relative use of a certain measure in a particular year is calculated as a weighted<sup>52</sup> moving average of order 3.<sup>53</sup>

Figure 1.2 Relative Use of Most Popular Financial Based Concepts

---

<sup>52</sup>The weighted average  $w_i = \frac{1}{2} x_i + \frac{1}{3} x_{i-1} + \frac{1}{6} x_{i-2}$

<sup>53</sup>It was decided to opt for a moving average instead of the original time series to smooth somewhat the irregular patterns, making the trend movement more clear. To correct somewhat for the impact of extreme values, weighted moving averages were calculated.



Source: Own calculations based on Table 1.3

The insights of Figure 1.2 are interesting. During 25 years, from 1973 till 1992, it seems that three concepts, return on equity, return on assets and return on investment have always been very popular. Together these three measures account for at least 40% of all the financially oriented operationalizations in the publications of a certain year. Most of the time they represent about 50% of all conceptualizations. However, individually the importance of the concepts has changed. While during the 1970s there was a preference for return on equity, this tendency has been wiped out during the 1980s. Since the beginning of the 1980s, return on assets is favored, in spite of return on equity.

Besides the popular category of profitability ratios, there is a second category of accounting based concepts, containing the cashflow based measures.<sup>54,55</sup> The cashflow, according to Ooghe and

<sup>54</sup>Several definitions of cashflows exist. For a discussion on the different operationalizations, see for instance, Ooghe and Van Wymeersch (1991: 81).

Van Wymeersch (1991: 90) is the amount of *financial resources* that result from the firm's activities during a certain reference period. It denotes the autofinancing capabilities of a firm.

Ooghe and Van Wymeersch (1991: 90) warn for the more and more spreading use of applying the cashflow as a substitute for the traditional accounting profits. Cashflows and profits are complementary but by no means substitutable notions.<sup>56</sup>

In the reference set of 215 studies, eight cashflow based concepts were found at the corporate level, while at the business unit level 21 cashflow concepts were discovered. No specific patterns of usage over time were detected.

### 2.1.2. Price Above Long-Run Average Cost

A second category of empirical measures to assess financial performance is the 'price above long-run average cost' measures. Schmalensee (1989: 960) says that:

'... the relevant theory deals with the ability of firms to hold price above long-run average cost, where "cost" is defined as usual to include competitive returns on capital employed.'

Although *Martin* (1984: 505, emphasis added) doubts whether:

---

<sup>55</sup>The cashflow concepts were classified as financial based concepts, although it can also be argued that they should be categorized as operational based concepts, because in fact these financial resources result from the operational activities of the firm.

<sup>56</sup>These authors (1991: 194) denote however a cashflow to equity measure as a gross profitability ratio.

'... *any* measure of profitability can be unambiguously identified as "correct," to the exclusion of all others, for purposes of economic analysis,'

he proposes that from economic theory the Lerner index<sup>57</sup> arises as a measure of monopoly power. On this basis he (1984: 505, emphasis added) concludes that:

' The *price-average cost margin* or *rate of return on sales* is a measure of profitability which may be used for economic analysis.'

By advancing these measures as useful measures for economic analysis, Martin implicitly acknowledges the value of accounting data to measure economic performance.

Scherer and Ross (1990: 416) note that up to now very few researchers have used accounting based estimates of the price-average cost margin, probably because it requires an estimate of the competitive rate of return on capital employed, which is not recorded in a firm's accounting records and which can only be estimated with great difficulty. This observation is confirmed in the review conducted in this paper. In only 1 of the 215 studies, a proxy for the price-average cost margin was found.

The second measure proposed by Martin, the rate of return on sales, is more regularly used. At the corporate level, only once the rate of return on sales was applied to assess the performance of

---

<sup>57</sup>The Lerner index equals the ratio of price minus marginal cost to price and is a performance-oriented measure, directly reflecting the allocative inefficient departure of price with marginal cost associated with monopoly power, define Scherer and Ross (1990: 70).

Whether the Lerner index and related measures are valid measures to assess firm performance, is linked to the discussion in Section 2. There, the occurrence of monopoly power is examined as one of the *theoretical* explanations for the existence of performance differences. Here, it suffices to state that the Lerner index is in essence also a financial performance measure as they are defined in this research.

firms. The return on sales measure is more commonly used at the level of the business unit, 20 entries were discovered.

As these theoretical measures are proxied by *accounting based* estimates, this implies that the critiques that were formulated on the 'pure' accounting rates of return can easily be transferred to these measures. However, no clear pattern in the usage of return of sales as a financial based performance concept was detected. This might (partly) be due to the relatively small number of entries (21).

### 2.1.3. Price Cost Margins

The third class of financial performance measures are the price cost margins (PCM). These are defined by Scherer and Ross (1990: 418) as:<sup>58</sup>

$$\text{PCM} = \{\text{Total Sales} - \text{Material Costs} - \text{Payroll Costs}\} / \{\text{Total Sales}\}$$

Material costs and in-plant payroll costs are components from the price cost margin measure which are retrieved from the accounting system. Consequently, the numerous critiques that were formulated on the validity of accounting rates of return are 'automatically' imputed in the price cost margin measures as well.

An advantage of the price cost margin measures is that they are usually collected at a more disaggregated level than accounting rates of return are. In the U.S., explain Scherer and Ross (1990: 418), the price cost margin data are collected for the manufacturing industries by the U.S. Census

---

<sup>58</sup>Other very related specifications can be found in empirical research studies. In Table 1.3 these measures were grouped in the category financial, accounting based, price cost margin measures.

Bureau at the *level of the individual plants*. Scherer and Ross (1990: 418) also note that the price cost margin measures can be used as estimates for the Lerner index.

The overview in Table 1.3 shows that price cost measures are more frequently applied. Although only 3 studies out of 46 at the corporate level used price cost margins as a dependent variable, these measures seem to be a popular category of performance measures at the more disaggregated business unit level: on 168 studies at this level, 48 entries were found. Considering the specific characteristics of these data, this result should not be surprising. Unfortunately, no clear pattern of the relative usage of price cost margins was found either.

#### 2.1.4. Market Based Performance Measures

The last category of financial performance measures are the market based ones. Because those measures use the market value of a firm as a whole, these market based measures are usually specified at the corporate level and this only for the firms listed on the stock market.

At first sight, the literature review in this paper does not confirm the proposition that market based performance concepts are more frequently employed at the corporate level than at the business unit level. On a total of 46 corporate level studies, 12 times a market based performance concept was proxied, contrasted to 24 times for 168 surveys at the business unit level. On a relative basis however, market based measures are twice as frequently applied at the corporate level.

The occurrence of market based concepts in 20 business level surveys can be explained by the fact that market based measures are also used for measuring the performance of a single business firm or narrowly diversified firms with dominant activities. Allocating all transactions of a (narrowly diversified) firm to a single, dominant activity is a practice that is regularly applied in empirical

research. In this case the impact of the diversified portfolio of a firm is ignored. Whenever, this practice was applied in a study under review, it was classified as a study analyzing performance related topics at the business unit level.

Compared to the accounting based financial performance measures, the market based ones are still infrequently applied. Moreover, no specific patterns in the usage of these measures were found.

Schmalensee (1989: 961) distinguishes *three types* of market based measures: Stigler's ratio, the excess value ratio and Tobin's Q. In 1963 Stigler defined the ratio of the market value of a firm's *equity* to its inflation-adjusted *book value*. This measure is infrequently used in the empirical literature. Only three proxies for this measure, operationalized as market value over equity were found in the review of the 215 studies.

Thomadakis (1977: 181, emphasis added) defines his excess value ratio as:

'... the difference between total firm value and *book value* of assets, normalized by *sales*'.

The total firm value is computed as the sum of the market value of equity and the *book value* of debt. In the review only two studies contained a rough estimate for this measure, namely market value of equity and debt divided by sales.

Finally, Tobin's Q<sup>59</sup> is the ratio of the total market value of a firm and the *replacement cost of the assets*. According to Smirlock, Gilligan and Marshall (1986: 1054) the total market value of a firm consists of three elements: the capitalized rents earned thanks to monopoly power,<sup>60</sup> the capitalized rents attributable to the scarcity of resources and the present value of the current asset stock. The denominator is the market value of the firm's current productive base of assets. To calculate the market value of a firm most authors<sup>61</sup> rely on the methodology developed by

---

<sup>59</sup>The Tobin's Q measure was originally developed by James Tobin for macroeconomic analysis. The measure was introduced in the domain of Industrial Organization by Lindenberg and Ross, see Scherer and Ross (1990: 417).

<sup>60</sup>For a discussion of the concept monopoly power and its relation to firm performance and performance differences, see Vandingenen and Bostyn (2003-2004b).

<sup>61</sup>Authors who base their calculations on these procedures are e.g. Smirlock, Gilligan and Marschall (1984: 1211-1213), Shepherd (1986: 1205-1210) and Stevens (1990: 618-623).

Lindenberg and Ross (1981: 1-32) and define the market value as the sum of a firm's common and preferred stock plus the value of the outstanding debt, note Scherer and Ross (1990: 417).

From this it can be concluded that a firm operating in a perfectly competitive market should have a Tobin's Q ratio of exactly 1. Only in this case the market value of the firm will exactly equal the market value of its productive capital resources, Scherer and Ross (1990: 417) explain.

In the review only five studies operationalized the Tobin's Q concept. Of these five studies four examined performance related issues at the business unit level.

While Schmalensee (1989: 961) distinguishes three types of market based measures, in the literature review other measures were found as well. In three studies Marris V was applied. This measure is usually defined as the ratio of book value of debt plus market value of equity to book value of *total assets*, see Schwalbach, Grasshoff and Mahmood (1989: 1632), Schwalbach and Mahmood, in: Mueller (1990: 108) and Charreaux (1991: 529). Schwalbach, Grasshoff and Mahmood (1989: 1632), Schwalbach and Mahmood, in: Mueller (1990: 109) prefer this measure above the more well-known Tobin's Q because the denominator of Marris V is the book value of total assets of the firm. As such this market measure becomes more easily comparable with the accounting based measure return on assets. Moreover, compared to Tobin's Q which has the replacement value of assets in the denominator, Marris V is also more easily computable.

A final category of market based measures which is of some significance in the review list but which is not referred to by Schmalensee, is the 'stock price' based category. This category contains measures which use as the nominator and/or the denominator the firm's stock price

quotation<sup>62</sup>. This category contains e.g. the price/earnings ratio and the market return per share. This last measure is defined as the shareholder's dividend per share plus the change in stock price quotation of the share during the reference period divided by the stock price at the beginning of the period.

The definitions of these market based performance measures show that all these measures rely on accounting data. Each of these measures contains components that are valued at *book value*. Therefore, it can be concluded that much of the critiques on the validity of accounting rates of return will also apply to these market based measures.

However, compared to accounting based measures of performance, which assess the success of past investments, the market based measures are said to be more future-oriented. Indeed, as efficient capital markets are told to evaluate all available information about the future perspectives of a firm, the market values should be measures of the future firm rents, the ex ante economic rate of return, acknowledges Thomadakis (1977: 179). Therefore, more accurate measures of firm rents can be defined by combining financial market data, argue Smirlock, Gilligan and Marschall (1984: 1054). They (1986: 1212) strongly advocate the usage of Tobin's Q while stating:

'... any measure of firm rents must consider both the future stream of firm profits and the risk involved in that profit stream.  $q$  does this, while simple accounting profits do not'.

---

<sup>62</sup>It should be noted that the concept 'growth in earnings per share' was classified as an accounting based concept not as a market based one. This because this concept can be measured by using only data that can be retrieved from a firm's annual reports. Solely, the accounting level of profits and the *number* of shares outstanding, are needed to compound this measure. No stock market prices of common and preferred stock nor the value of outstanding debt are required.

This argumentation is clearly linked to the 'timing issue'. McFarland (1988: 614) adds to this that Tobin's Q has the additional advantage of being less sensitive to the distorting impact of inflation, because its denominator is the replacement value and not the book value of a firm's assets.

Notwithstanding these advantages, market based measures have *drawbacks* too. Shepherd (1986: 1206) argues that these measures are debatable exactly because the market value is subject to capital market fluctuations. He also questions the rather 'arbitrary' calculation procedures. Indeed, in the numerator the valuation of preferred stock and debt are subject to complex and disputable methods. This while the accounting literature has shown that it is nearly impossible to calculate reliable estimates for the replacement value of the assets. Therefore, he (1986: 1206-1207) concludes that the estimated market based ratios are likely to be inferior measures of firm performance, because calculations add measurement error to the already intrinsic errors in the accounting data.

As Schmalensee (1989: 961) notes, the debates on the relative advantages of the different classes of financial performance measures would lose much of its importance, if it could be shown that all these measures are highly correlated. He (1989: 961) argues that the correlations among accounting rates of return are high, while Shepherd (1986:1207-1208) shows that accounting rate of return and Tobin's Q are also rather highly correlated ( $R^2=0.65$ ). Moreover, the regression results do not seem to be very sensitive to the type of measure used, conclude Schmalensee (1989: 961) and Shepherd (1986: 1207-1208). Therefore, it seems that these measures are indeed alternative measures for the same concept, namely the financial performance of a firm.

To shed some light on the debate, McFarland (1988: 618) performed a Monte Carlo simulation study. His results show that both the accounting rates of return and the measured Tobin's Q are likely to have a large positive bias and a large root mean square error. Tobin's Q however seems to outperform the accounting rate of return in every experiment.

However, both accounting rates of return and Tobin's Q seem to be rather well correlated to the 'true' rates of return, but also here the Tobin's Q estimates seem to be substantially better than the accounting rates of return and these results are consistent across all experiments, shows McFarland (1988: 618). Not only are Tobin's Q estimates more closely related to the true measure, they are also no more likely to estimate spurious empirical relationships. Nevertheless McFarland (1988: 622) warns that both these classes of measures have to be used with care while concluding that:

'... accounting estimates of q are neither consistently better nor worse than the accounting rate of return in detecting supracompetitive profits.'

Stevens (1990: 618-619) notes that the fundamental issue in the debate on the accounting based rates of return versus Tobin's Q estimates results from the fact that researchers are reasoning from different research perspectives. Economists would tend to reason in terms of firm *profitability*, while researchers in finance tend to focus on the *valuation* of the firm.<sup>63</sup> He argues (1990: 619) though that also economists can benefit from the use of financially oriented measures as Tobin's Q. Schmalensee (1989: 961) indicates that the correlations between accounting rates of return and price cost margins are rather weak and that the regression results differ according to the type of measure selected.

From this discussion one can conclude that every class of financial performance measures is *by definition* 'contaminated' by (possibly severe) distorting effects introduced through the application of the generally accepted accounting principles. Therefore, we tend to agree with Martin (1984: 505) who doubts whether a 'correct' measure can be defined for economic analysis.

---

<sup>63</sup>Of course, this argumentation directly plows back to the timing issue.

However, this does not mean that financial measures do not contain any information on the economic performance of a firm. As was advocated earlier, a constructive view should be applied which will prove more fruitful than throwing the hands up in despair.

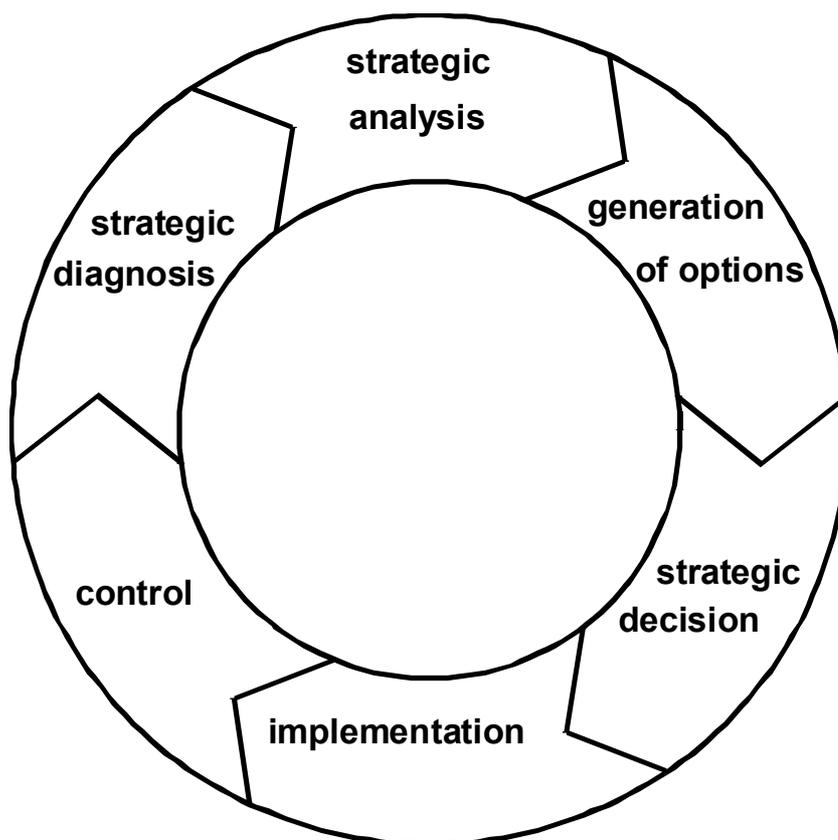
On the contrary, particular categories of measures seem to be more appropriate at a certain *time*,<sup>64</sup> at a certain stage of the strategy formulation process. This can be illustrated by using Daems' (1996: 8) strategy process framework.

To assess the firm's *current position*, e.g. for *strategic diagnosis* purposes, market based measures should be preferred, because those measures use the *current market value* of the firm, which incorporates the future prospects of the firm based on its current position. For *strategic analysis* a multitude of measures can be used such as traditional accounting profitability ratios and cashflow ratios.

---

<sup>64</sup>Again, this is clearly linked to the 'timing problem' inherent to the strategy formulation process, see supra paragraph 1.1.

Figure 1.3 Six Phases of the Strategy Process



Source: Daems, H.: Designing a Competitive Strategy, Concept and Tools, 1996, p. 8

To *evaluate*, to test the available strategic options however, discounted cash flow procedures are required. In other words, for strategic *decision-making* on *new* commitment-intensive investments, discounted cashflow procedures are the guiding criterion. *Once the capital is committed* however, the focus shifts to operationally oriented measures to follow up the *implementation* of the strategic decisions. For these *implementation* issues, to guide and control the effectiveness of the transformation processes in the several business activities, an array of operational measures can be used<sup>65</sup>. To assess the financial performance of the committed investments, accounting based measures will become more appropriate.

---

<sup>65</sup>The use of operational measures, which are not strictly financially oriented measures will be discussed in more detail in paragraph 2.2.

For *control* purposes once the investment is made, the attention shifts to an objective of maximizing the rate of return earned on those investments. Here, accounting profitability and cashflow measures enter the picture and will prove their value to their fullest extent. From this, one can conclude that several categories of financial based and operationally oriented measures have (a) specific purpose(s) in the strategy formulation-implementation-control process.

## 2.2. Operational Performance Measures

As was discussed in paragraph 1.3 a second conceptualization of firm performance is the one including operational performance, following Venkatraman and Ramanujam (1986: 804). Due to the correspondence between the concept operational performance and the value chain concept, one can argue that the operational performance of a firm is driven by the operational performance of the firm in each of its value chain activities. One can also pose that the operational performance of a certain value chain activity measures the achievement of that activity's functional strategy.<sup>66</sup>

As a firm is composed of several activities, it is only normal that a variety of measures of operational performance can be defined to measure the efficiency of the transformation processes in each of these activities. Venkatraman and Ramanujam (1986: 804) classify measures as market share, new product introduction, product quality, marketing effectiveness, manufacturing value added into this category.

---

<sup>66</sup>Compare this statement to the definition of performance formulated in paragraph 1.1, where performance was defined as the outcome of a strategy.

In Table 1.3 it was tried to group the measures that could be classified as operational measures, according to the value chain activity to which they correspond the most. Of course, this classification can be debated upon<sup>67</sup>.

Although a variety of operational concepts were found, it is clear from the table that compared to financially related concepts, operational conceptualizations are (still) rather infrequently used in empirical performance related research. For the corporate level, 17 conceptualizations out of 97 were operationally oriented, contrasted to 78 for the financially oriented ones. For the business unit level, the ratio is 54 to 304 and 242 to 304 for respectively the operationally and the financially oriented ones.

In total 22 *operations* related concepts were found. It should however not be too surprising that most of those concepts (20) relate to the activities at the business unit level. Concepts as value added, capacity utilization and productivity belong to this category.

Several *marketing and sales* related concepts were detected. However, compared to the *total* number of conceptualizations they only represent a minor proportion, namely 8%. In the marketing field however, sales and market share measures are used more frequently to assess a firm's position in a market<sup>68</sup>. Numerous researchers as Naert and Leeflang (1978: 406) and Cooper and Nakanishi (1988: 280) actively involved in sales and market share modelling provide some

---

<sup>67</sup>For instance, the concept 'growth of assets' was put in the category reflecting firm infrastructure. This while other researchers will argue that it should be coded in the 'operations' category, because the majority of total assets will usually represent book value of plant and equipment. However, here it was decided to opt for the class firm infrastructure, because total assets contains more than fixed, productive assets. Also, it is not always very clear whether some concepts e.g. cash flow related ones, have to be classified as financially oriented accounting based concepts or as operationally oriented ones because they result from the operational activities of the firm, see paragraph 2.1.1.

<sup>68</sup>The frequent use of sales and market share measures as dependent variables in marketing models to assess the market performance of a firm is not apparent from Table 1.3. This can be explained by the fact that the selection of the empirical research studies was mainly driven by the selection of research topics which were clearly related to the performance of a firm, not to the assessment of functional strategies, see supra Section 2.

evidence for this. It is also in this field that serious efforts have been made to assess the validity of these marketing-effectiveness measures.

In the class *firm infrastructure* concepts as the growth rate of total assets and asset turnover were coded. Again, the actual classification of some measures can be questioned. Although asset turnover is the linking pin concept between two profitability ratios, return on sales and return on assets, it was decided to classify this ratio into the category operational - firm infrastructure concepts because it measures the efficient use of the available assets<sup>69</sup>.

Finally, concepts which are related to the innovative efforts of the firm, e.g. the number of (successful) research projects, are classified in the category *technology development*.

However, a profound discussion of the validity of operational measures for performance modelling seems to be lacking<sup>70</sup>. Therefore, not much can be said about the validity of these operational measures. Venkatraman and Ramanujam (1986: 804) however seem to attribute some merit to these measures because they conclude:

'... the inclusion of operational performance indicators takes us beyond the "black box" approach that seems to characterize the exclusive use of financial indicators and focuses on those key operational success factors that might *lead* to financial performance'.

---

<sup>69</sup>Ooghe and Van Wymeersch (1991: deel 1: 187) and (1991: deel 2: 78) for instance, as financial accountants, classify the asset turnover as a profitability ratio.

<sup>70</sup>This is probably due to the relative infrequent use of these measures for performance modelling to date.

### 2.3. Organizational Effectiveness Indicators

The broadest conceptualization of firm performance is the concept of organizational effectiveness, argue Venkatraman and Ramanujam (1986: 804). This concept draws upon literature and theories in organizational behavior. Venkatraman and Ramanujam (1986: 804) note that in this literature there are severe debates going on on how to operationalize this concept. They argue that this discussion can probably be attributed to the breadth of the concept itself. On the validity of these measures as indicators of firm performance even less research seems to be available.

Venkatraman and Ramanujam (1986: 804) also mention that it appears as if most strategy studies are restricted to the evaluation of financial and operational performance. This picture seems to be confirmed by the classification in Table 1.3. Compared to the second category, indicators of organizational effectiveness as measures of firm performance are even more seldom used. At the corporate level, only two conceptualizations of organizational performance were detected. At the level of the business unit, only 8 organizational performance concepts on a total of 304 were discovered. Moreover, 9 of the in total 10 of these concepts are solely related to the interests of the employees. Only one study operationalized a concept which incorporates the viewpoints of multiple stakeholders.

### 3. Strengthening the Construct Validity of Financial Performance Measures

The previous discussion and debate reveal that efforts should be made to strengthen the construct validity of (a) financial performance measure(s). This conclusion is also empirically strengthened by the findings of the research of Vandingenen (1993).

To accomplish this task, first, a clear *conceptual definition* should be formulated stressing that actually the *superior* firm financial performance is aimed for. Second, the operationalization of more valid financial performance measures measuring *this* concept should be developed.

### 3.1. From Accounting Rates of Return to Residual Income

In the previous paragraphs of this paper special attention was explicitly given at defining and measuring accounting rates of return. Indeed, Simons (2000: 173) asserts that profit, the nominator of any accounting rate of return, is the cornerstone of financial performance from an investor's perspective. However, he continues, a measure of profit on a standalone basis does not take into account the level of investment needed to generate that profit. Accounting rates of return as RoI, RoA and RoE remedy this problem by considering explicitly an underlying level of investment.

Though, these accounting rates of return do not measure the old accounting concept of residual income, which comes conceptually much closer to the concept denoted in this research as superior firm performance. According to Simons (2000: 174) residual income takes into consideration how much profit investors *expect* to earn from their capital. He (2000: 174) defines residual income as:

‘...a measure of how much additional profit remains for (1) investment in the business or (2) distribution to the owners after allowing for normal (expected) returns on investment. It is calculated by subtracting the normal cost of capital used in the business, calculated at market rates, from accounting profit.’

The main idea of the concept of residual income lays behind two developments in the '90s, namely the refinement of Stern Steward & Co. of their concept 'economic value added'<sup>TM</sup> and the conceptualization and measurement of 'added value' by Kay and his research team.

### 3.2. Economic Value Added<sup>TM</sup>

The consultants of Stern Steward & Co. elaborated the concept of residual income into the calculation which became known as economic value added<sup>TM</sup>, EVA. Simons (2000: 176) notes that this calculation is comparable to residual income but distinguishes itself by incorporating on the one hand, a set of adjustments to correct for potential distortions of accrual accounting, while on the other hand, including both debt and equity in the computation of the cost of capital.

The major adjustments to eliminate the distortions of accrual accounting are fourfold, explains Simons (2000: 176). First, a correction is made for the inventory accounting policy of the firm. If LIFO is applied, the balance sheet figure is regularly understated, reflecting product costs that are usually out of date. Consequently, Simons (2000: 177) clarifies:

‘...for EVA purposes, the value of the inventory account on the balance sheet is adjusted to *current cost* to more accurately reflect the true value of working capital under the control of management.’

Second, two adjustments are to be made to account for the deferred tax expense in EVA calculations. According to Simons (2000: 177), on the one hand the current year's income tax expense is added back to income, while on the other hand, deferred taxes payable on the balance sheet are interpreted as belonging to the capital of the firm.

Third, again two adjustments are carried out to reckon for the amortization of goodwill. Simons (2000: 177-178) makes clear:

‘...First, the reduction in income due to the amortization of goodwill in the current period is added back to income. Second, to the extent that accumulated amortization has eroded goodwill, the balance sheet is restated to reflect the full purchase price of the acquisition.’

Fourth, there is the treatment of research and development expenses. For years a debate is going on on how to account for research and development expenditures. One group of adherents poses that these ‘expenses’ should be accounted for as assets and therefore appear on the balance sheet. The opponents of this procedure argue that not all research and development can be considered to be valuable assets. Consequently, they reason that research and development expenses should be handled as expenditures of the current period. For EVA calculations, Simons (2000: 178) explicates, research and development expenditures are handled as valuable assets and are inscribed on the balance sheet and amortized over an expected life time period.

Besides the adjustments made to eliminate the distortions of accrual accounting, there are the adaptations to be carried out to calculate the appropriate cost of capital. When the value of equity and debt are determined, the weighed average cost of capital is calculated. This weighted average cost of capital is applied to determine the expected return on the true value of assets, the capital base of the firm. Finally, this expected return is subtracted from the actual profit - after EVA adjustments - to become the measure of residual income, EVA, asserts Simons (2000: 178-179).

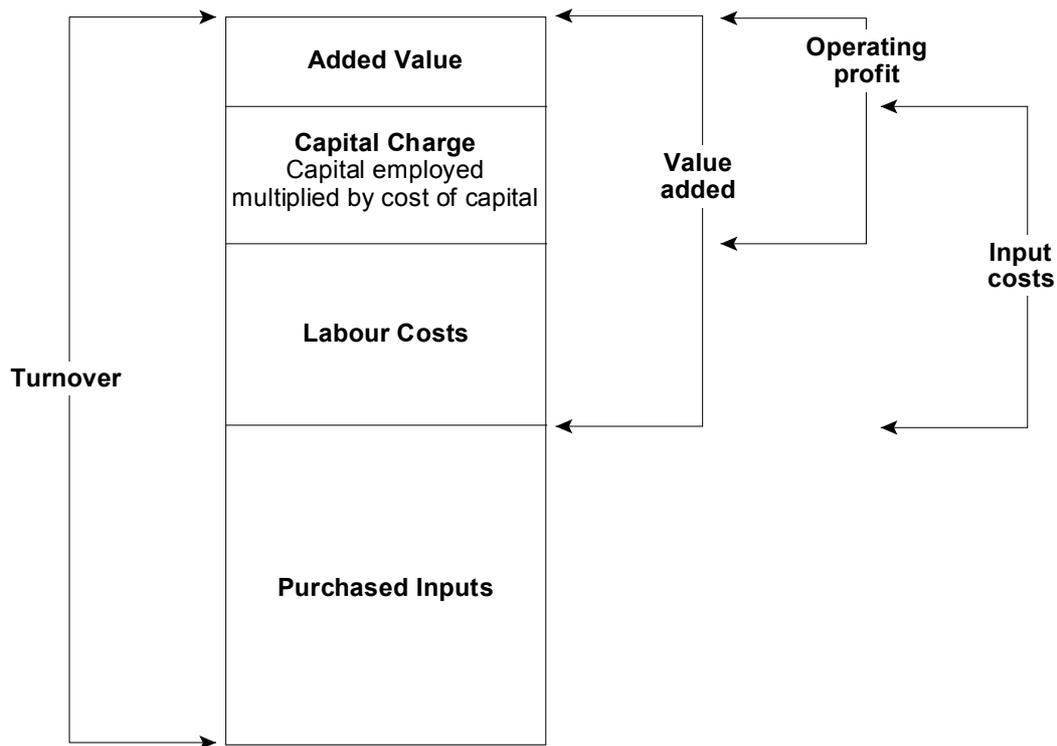
### 3.3. Added Value

Added value stands for a concept and a measurement procedure which is developed in the beginning of the 1990's by Kay and his research team. Added value corresponds to the *economic rent* or *supranormal profit* called by economists, that may not actually accrue to the shareholders or investors, but is created by the existence of the whole firm rather than being derived from the contribution of any one of its stakeholders, state Davis and Kay (1990: 10).

According to Davis and Kay (1990: 1), added value is the economic loss resulting if a firm were broken up and its inputs dispersed elsewhere in the economy. In other words, it measures the net value that the firm contributes to the economy through its existence, assert Davis and Kay (1990: 10).

Conceptually, added value is defined by Davis and Kay (1990: 1) as the amount by which the value of the firm's output exceeds the value of all the inputs which the company uses, including not only material inputs, but also capital and labor. Figure 1.4 shows how added value is derived from a firm's revenues.

Figure 1.4 The Components of Firm Output



Source: Davis and Kay (1990: 11)

The algorithm for measuring added value is not complicated and is described in detail in Davis and Kay (1990: 13). *First*, the amount of capital employed in the firm should be determined. This capital stock, the capital employed, consists of the tangible assets valued at current costs plus the firm's stocks. As the current cost valuation of capital is usually not available, the historic cost has to provide as a substitute, explain Davis and Kay (1990: 13). In their subsequent research, Davis, Flanders and Star (1991: 27-29) extend their operationalization of the added value concept by estimating current cost accounts.

*Second*, a charge is carried for this capital employed by multiplying the value of the capital employed by some 'normal' return on capital. Such a normal cost of capital is ideally the opportunity cost of capital of the firm. To approximate the opportunity cost of capital, Davis and Kay (1990: 13) suggest to apply the long term corporate bond rate for highly rated companies in nominal terms, while Davis, Flanders and Star (1991: 3) suggest to opt for the interest rate on safe

bonds. However, the Davis and Kay (1990: 13) are well aware of the fact that using the nominal long term bond rate for safe highly graded companies is only justifiable on grounds of simplicity.

Ideally, the rate of risk should be rated to account for the demand of higher returns for risky firms compared to non-risky firms. To accomplish that asset beta's would have to be estimated, explain Davis and Kay (1990: 13), which is recommended, but which removes much simplicity and a substantial portion of objectivity from each company's measurement, stress Davis and Kay (1990: 13). In their 1991 study Davis, Flanders and Star (1991: 13, 25) also applied a risk free interest rate, - the nominal, long-term government bond rate - which is lower than a risk adjusted rate. They (1991: 13) however account for risk adjustment using asset beta's (as opposed to the equity beta's commonly used in portfolio analysis), but this approach made large and apparently arbitrary changes to the results.<sup>71</sup>

*Third*, the capital charge should be deducted from the operating profits of the firm, leaving profit net of 'normal' return to capital. This final value is a measure for added value and measures the competitive advantage of a firm, conclude Davis and Kay (1990: 14).<sup>72</sup>

Of course, Davis and Kay (1990: 13) explain (a) relative measure(s) based on added value can be derived. According to the authors (1990: 13) best is to take as denominator the firm's own inputs (capital charge and cost of labor), which corresponds to the conventional measure of value added minus the added value itself.<sup>73</sup>

---

<sup>71</sup>Davis, Flanders and Star (1991: 13) acknowledge that it is clearly in this area their research needs most further work. The researchers continued their struggle and Davis and Star published in 1993 an adapted methodology, applying a typical cost of equity, rather than a typical bond rate. According to the authors (1993: 12) these alterations 'should make little difference to the overall results, but should slightly refine their accuracy.'

<sup>72</sup>In the 1991 paper Davis, Flanders and Star (1991: 24, 27, 29) and in the 1993 paper Davis and Star (1993: 10) adjust the added value calculation, but the basic elements of the conceptualization remain.

<sup>73</sup>Of course, stress Davis and Kay (1990: 13), the (relative) measure of added value is only as good as the company accounts. If for instance operating profit is inflated by extraordinary items or if capital employed is understated, one

To close, Davis and Kay (1990: 16) clarify that added value is a tool for comparing the firm performance that can be used to evaluate performance within an industry and between different lines of business. Therefore, it is worthwhile trying to assess, based on the accounting data of the annual accounts published by the Belgian National Bank, NBB, whether (a) more valid measure(s) for the superior firm performance construct can be derived for the Belgian based firms.

#### 3.4. Additional Points of Interest for Assessing the Construct Validity of Superior Performance Measures

From this discussion on the multiple measures of (superior) firm performance apparently much of these measures, if not all frequently used ones, are ratio-based performance measures. Although it is not always noticed explicitly, several statistical problems exist when using ratio based performance measures, explain McGuire, Schneeweis and Hill (1986: 128).

The former authors (1986: 136) point out the severe difficulties that exist with ratio-based performance measures. Three of those problems apply to *each* ratio scale performance measure. First, the ratio form assumes a strictly proportional relationship between the ratio's numerator and denominator. Second, ratios may not be compared on an absolute scale, but should be standardized and compared to like firms. Finally, of course the use of the ratio performance measures should be determined by sound consistent theory.

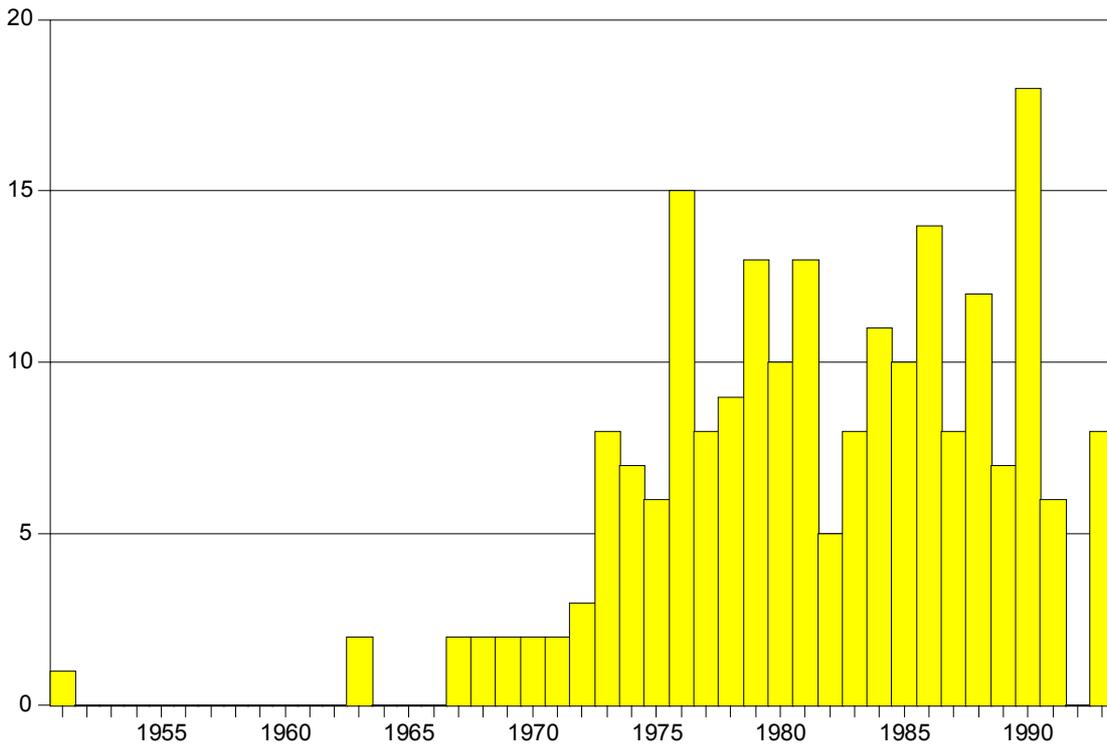
---

ends up with distorted result. This is the reason why in this research special attention will be given to assure the reliability of the company accounts.

## Appendix 1.1: Sources and Frequency of References in Review List

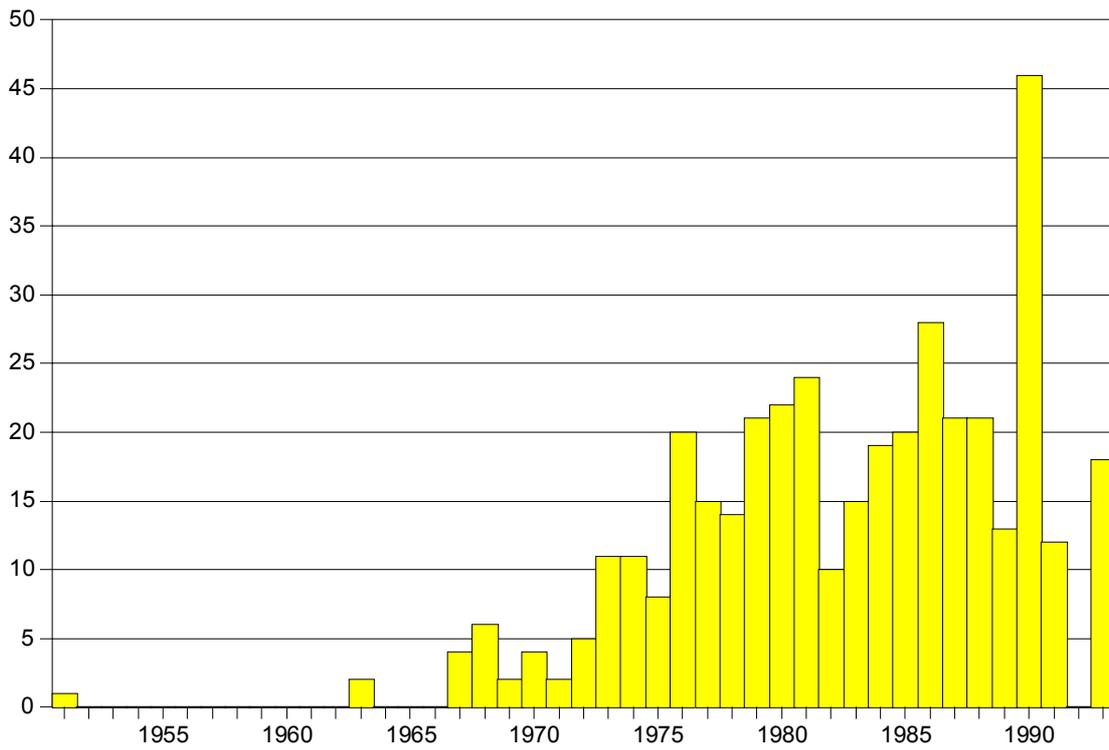
| Source  | Frequency  |
|---|------------|
| Academy of Management Journal   | 3          |
| Academy of Management Science   | 1          |
| Advances in Strategic Management  | 1          |
| American Economic Review  | 8          |
| Applied Economics   | 2          |
| Bedrijfskunde   | 1          |
| Bell Journal of Economics and Management Science                        | 2          |
| Bell Journal of Economics   | 3          |
| Cahiers Economiques de Bruxelles  | 1          |
| Economica   | 5          |
| Economics Letters   | 1          |
| Economies et Societes   | 1          |
| Economisch Statistische Berichten                                       | 1          |
| Economisch en Sociaal Tijdschrift                                       | 1          |
| European Economic Review  | 7          |
| Harvard Business Review   | 1          |
| International Journal of Industrial Organization                        | 7          |
| Japanese Economic Studies   | 1          |
| Journal of Business   | 4          |
| Journal of Economic Behavior and Organization                           | 1          |
| Journal of Industrial Economics   | 21         |
| Journal of Law and Economics  | 1          |
| Journal of Marketing Research   | 2          |
| Journal of Marketing  | 2          |
| Journal of Political Economy  | 1          |
| Kyklos  | 2          |
| Management Science  | 4          |
| Managerial and Decision Economics                                       | 8          |
| Marketing Science   | 1          |
| New York University Monograph   | 1          |
| Oxford Bulletin of Economics and Statistics                             | 4          |
| Oxford Economic Papers  | 7          |
| Quarterly Journal of Economics  | 5          |
| Rand Journal of Economics   | 1          |
| Recherches Economiques de Louvain                                       | 3          |
| Review of Economics and Statistics                                      | 24         |
| Revue Economique  | 4          |
| Revue d'Economie Industrielle   | 6          |
| Revue d'Economie Politique  | 3          |
| Sloan Management Review   | 2          |
| South African Journal of Economics                                      | 1          |
| Southern Economic Journal   | 12         |
| Strategic Management Journal  | 18         |
| Tijdschrift voor Economie en Management                                 | 2          |
| <b>Number of References Published in 44 Different Academic Journals</b> | <b>187</b> |
| Papers Published in Books   | 10         |
| Books   | 9          |
| Working Papers  | 7          |
| Unpublished Ph.D. Dissertations   | 2          |
| <b>Total Number of References in the Selection</b>                      | <b>215</b> |

## Appendix 1.2: Chronological Plot of the Number of References



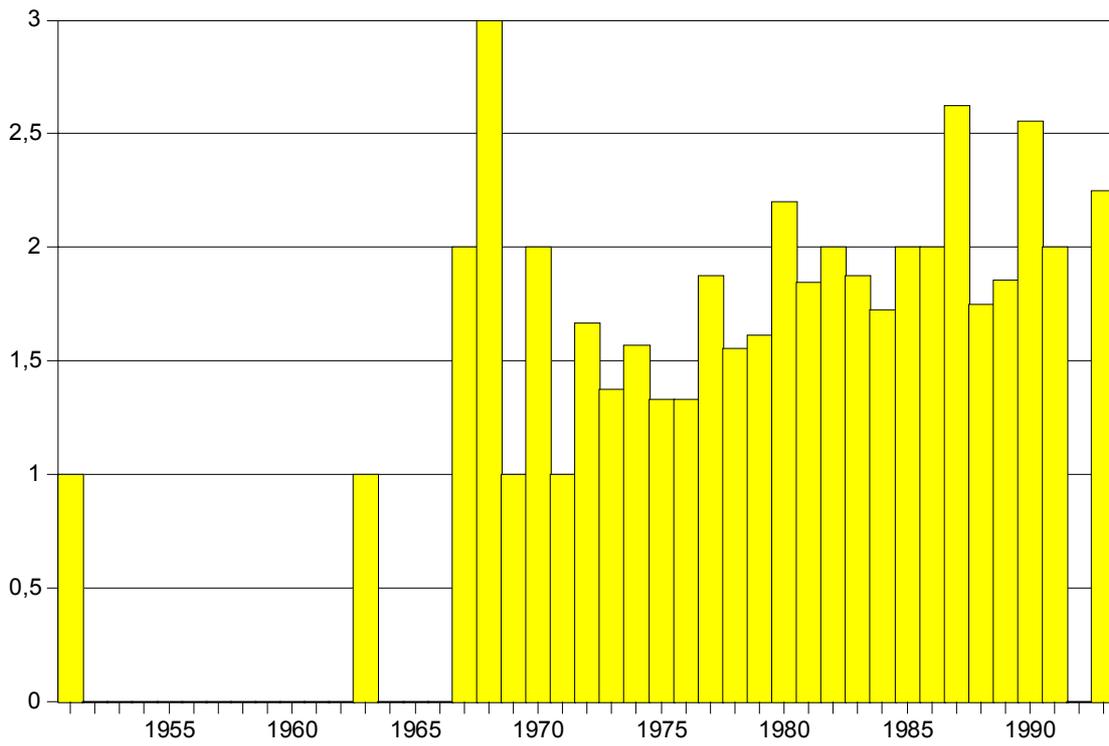
Source: 215 studies in reference set

### Appendix 1.3: Chronological Plot of the Number of Performance Concepts



Source: 215 studies in reference set

### Appendix 1.4: Chronological Plot of the Number of Performance Concepts per Study



Source: 215 studies in reference set

## **Appendix 1.5: Reference List of Table 1.3.**

### **Corporate Level - Return on Equity**

ASCH, P. and J. SENECA (1976); BINAME, J. and A. JACQUEMIN (1973); BUENO, E. and P. LAMOTHE (1984); CAPON, N., FARLEY J. and S. HOENIG (1990); CHRISTENSEN, H. and C. MONTGOMERY (1981); DALTON, J., and D. PENN (1976); ENCAOUA, D. and M. HEON (1979); GALE, B. (1972); HAMILTON, R. and G. SHERGILL (1993); ITAMI, H., T. KAGONO, H. YOSHIHARA and A. SAKUMA (1982); MARSH, T. and D. SWANSON (1984); McGUIRE, J., T. SCHNEEWEIS and J. HILL (1986); OOGHE, H., E. VERBAERE and P. BELLEMANS (1985); PALMER, J. (1973); SCHWALBACH, J. and T. MAHMOOD (1990); TEECE, D. (1981); THOMPSON, R. (1981); VARADARAJAN, P. (1986)

### **Corporate Level - Return on Investment**

CAPON, N., FARLEY J. and S. HOENIG (1990); CHRISTENSEN, H. and C. MONTGOMERY (1981); ITAMI, H., T. KAGONO, H. YOSHIHARA and A. SAKUMA (1982); JACOBSON, R. (1987); SALAMON, G. (1985)

### **Corporate Level - Return on Assets**

AMEL, D. and L. FROEB (1991); BERRY, C. (1975); BETTIS, R. and W. HALL (1982); BETTIS, R. and Y. MAHAJAN (1985); BETTIS, R. (1981); CAPON, N., FARLEY J. and S. HOENIG (1990); CHRISTENSEN, H. and C. MONTGOMERY (1981); DAEMS, H. and R. VANDINGENEN (Forth); HAMILTON, R. and G. SHERGILL (1993); HANSEN, G. and B. WERNERFELT (1989); HOLL, P. (1975); JACQUEMIN, A. and C. BERRY (1979); JACQUEMIN, A. and W. SAEZ (1976); JENNY, F. and A. WEBER (1990); KHEMANI, R. and D. SHAPIRO (1990); KIM, C., P. HWANG and W. BURGERS (1993); LAWRIWSKY, M. (1984); MUELLER, D. (1977); OOGHE, H., E. VERBAERE and P. BELLEMANS (1985); REED, R. and M. FRONMEULLER (1990); SALAMON, G. (1985); SCHWALBACH, J. and T. MAHMOOD (1990); SCHWALBACH, J., U. GRASSHOFF and T. MAHMOOD. (1989); TEECE, D. (1981); VARADARAJAN, P. (1986)

### **Corporate Level - Return on Sales**

CAPON, N., FARLEY J. and S. HOENIG (1990)

### **Corporate Level - Price Cost Margin**

CAPON, N., FARLEY J. and S. HOENIG (1990); JACQUEMIN, A. and S. LARSEN (1970); THOMPSON, R. (1981)

### **Corporate Level - Profit Level**

CAPON, N., FARLEY J. and S. HOENIG (1990); LABOUL, A. (1986)

### **Corporate Level - Growth in Profit**

ITAMI, H., T. KAGONO, H. YOSHIHARA and A. SAKUMA (1982); VARADARAJAN, P. (1986)

### **Corporate Level - Growth of Earnings per Share**

CHRISTENSEN, H. and C. MONTGOMERY (1981)

### **Corporate Level - Cash Flow**

CAPON, N., FARLEY J. and S. HOENIG (1990); SALAMON, G. (1985)

### **Corporate Level - Cash Flow/Equity**

BUENO, E. and P. LAMOTHE (1984)

**Corporate Level - Cash Flow/Total Assets**

DAEMS, H. and R. VANDINGENEN (Forth); OOGHE, H., E. VERBAERE and P. BELLEMANS (1985)

**Corporate Level - Cash Flow/Sales**

ENCAOUA, D. and M. HEON (1979); OOGHE, H., E. VERBAERE and P. BELLEMANS (1985); REED, R. and M. FRONMEULLER (1990)

**Corporate Level - Earnings Retention Rate**

LAWRIWSKY, M. (1984)

**Corporate Level - Tobin's Q**

WERNERFELT, B. and C. MONTGOMERY (1988)

**Corporate Level - Marris V**

SCHWALBACH, J. and T. MAHMOOD (1990); SCHWALBACH, J., U. GRASSHOFF and T. MAHMOOD. (1989)

**Corporate Level - Market Value**

CHANEY, P., T. DEVINNE and R. WINER (Forth); STANO, M. (1976)

**Corporate Level - Stock Price**

CHANEY, P., T. DEVINNEY and R. WINER (Forth); DEVINNEY, T. (Forth); JACOBSON, R. (1987); THOMPSON, R. (1981)

**Corporate Level - Other Market Based Concepts**

BECK, R. (1986); CAPON, N., FARLEY J. and S. HOENIG (1990); MARSH, T. and D. SWANSON (1984)

**Corporate Level - Value Added**

PORTER, M. (1976)

**Corporate Level - Productivity**

PORTER, M. (1976)

**Corporate Level - Growth of Sales**

BINAME, J. and A. JACQUEMIN (1973); CHRISTENSEN, H. and C. MONTGOMERY (1981); HAMILTON, R. and G. SHERGILL (1993); ITAMI, H., T. KAGONO, H. YOSHIHARA and A. SAKUMA (1982); JACQUEMIN, A. and W. SAEZ (1976); LABOUL, A. (1986); VARADARAJAN, P. (1986)

### **Corporate Level - Growth of Assets**

BERRY, C. (1975); HOLL, P. (1975); JACQUEMIN, A. and C. BERRY (1979); JACQUEMIN, A. and S. LARSEN (1970); LAWRIWSKY, M. (1984)

### **Corporate Level - Asset Turnover**

REED, R. and M. FRONMEULLER (1990)

### **Corporate Level - R&D**

DEVINNEY, T. (Forth); FINET, A. (1975)

### **Corporate Level - Wages**

FEINBERG, R. (1979)

### **Corporate Level - Employment Instability**

FEINBERG, R. (1979)

### **Business Unit Level - Return on Equity**

ADAMS, W. (1976); ADAMS, W. (1977); ARMOUR, H. and D. TEECE (1978); BAIN, J. (1951); BALASSE, A. (1986); BASS, F., P. CATTIN and D. WITTINK (1978); BEARD, D., and G. DESS (1981); BOTHWELL, J., T. COOLEY and T. HALL (1984); BOWMAN, E. (1980); BROZEN, Y. (1971); BUHNER, R. (1987); CAPON, N., FARLEY J. and S. HOENIG (1990); CAVES, R. and PUGEL T. (1980); CAVES, R. (1974); CHAKRAVARTHY, B. (1986); CHARREAUX, G. (1991); COLLINS, N. and L. PRESTON (1968); DE COUSSERGUES S. (1975); DE WOOT, P. and HEYVAERT H. (1979); DONSOMI, M. and V. LEOZ-ARGUELLES (1981); ENCAOUA, D. and B. FRANCK (1980); FISHER, I. and G. HALL (1969); FISHER, I. and G. HALL (1971); FRAZIER, C. and R. HOWELL (1983); GRANT, R. and A. JAMMINE (1988); HALL, M. and L. WEISS (1967); HATTEN, K. and D. SCHENDEL (1977); HURDLE, G. (1974); JEGERS, M. (1987); JENNY F. and A.-P. WEBER (1974); JOHNSON, G. and H. THOMAS (1987); KEATING, B. (1991); MARTIN, S. (1979); MILLER, R. (1967); OOGHE, H. and W. DE GROOTE (1983); ORNSTEIN, S. (1972); ORR, D. (1974); PHILIPS, L. (1990); PORTER, M. (1974); PORTER, M. (1976); PORTER, M. (1979); QUALLS, P. (1972); SCHEFCZYK, M. (1993); SHEPHERD, W. (1986); STEER, P. and J. CABLE (1978); VAN HERCK, G. (1981); VAN MEERHAEGHE, M. (1963); VANLOMMEL, E., B. DE BRABANDER and D. LIEBAERS (1976); WHITTINGTON, G. (1980)

### **Business Unit Level - Return on Investment**

AAKER, D. and R. JACOBSON (1987); BALASSE, A. (1986); BUZZELL, R. and B. GALE (1987); CAPON, N., FARLEY J. and S. HOENIG (1990); CAVES, R., M. PORTER, A. SPENCE and J. SCOTT (1980); DAY, C. (1973); DE WOLF, P. (1982); GHEMAWAT, P. and R. CAVES (1986); HARRIGAN, K. (1981); HILL, C. (1985); JACOBSON, R. (1988); JACOBSON, R. (1990); MILES, G., C. SNOW and M. SHARFMAN (1993); McENALLY, R. (1976); SHAPIRO, D. (1983); STEER, P. and J. CABLE (1978)

### **Business Unit Level - Return on Assets**

AMATO, L. and R. WILDER (1985); AMATO, L. and R. WILDER (1990); BALASSE, A. (1990); BARNEY, J. and R. HOSKISSON (1990); BEARD, D., and G. DESS (1981); BOTHWELL, J., T. COOLEY and T. HALL (1984); BUCKLEY, P., J. DUNNING and R. PEARCE (1984); BUHNER, R. (1987); BURGESS, A. (1982); BUXTON, A. and G. WILKINSON (1976); CAPON, N., FARLEY J. and S. HOENIG (1990); CAVES, R. and PUGEL T. (1980); CHAKRAVARTHY, B. (1986); CHARREAUX, G. (1991); COLLINS, N. and L. PRESTON (1968); CONRAD, G. and I. PLOTKIN (1968); COOTNER, P. and D. HOLLAND (1970); CUBBIN, J. and P. GEROSKI (1987); CUBBIN, J. and P. GEROSKI (1990); DAEMS, H. and P. VAN de WEYER (1993); DE WOLF, P. (1982); FRAZIER, C. and R. HOWELL (1983); FUNKE, M. (1986); GRANT, R. and A. JAMMINE (1988);

GRINYER, P., P. McKIERNAN and M. YASAI-ARDEKANI (1988); HALL, M. and L. WEISS (1967); HILLER, J. (1978); INGHAM, K. (1976); JACQUEMIN, A. and M. CARDON de LICHTBUER (1973); JEGERS, M. (1987); JENNY F. and A.-P. WEBER (1974); LENZ, R. (1980); MARTIN, S. (1979); MARVEL, H. (1980); MEGNA, P. and D. MUELLER (1981); MILLER, R. (1967); MUELLER, D. (1985); MUELLER, D. (1990); ODAGIRI, H. and H. YAMAWAKI (1985); ODAGIRI, H. and H. YAMAWAKI (1990); RUMELT, R. (1991); SCHMALENSEE, R. (1985); SCHMALENSEE, R. (1989); SCHOHL, F. (1990); SCOTT, J. and G. PASCOE G. (1986); SHAPIRO, D. (1983); STIGLER, G. (1963); STONEBRAKER, R. (1976); WEINER, N. and T. MAHONEY (1981); WINN, D. (1977); YAMAWAKI, H. (1989)

#### **Business Unit Level - Return on Sales**

BUZZELL, R. and B. GALE (1987); CAPON, N., FARLEY J. and S. HOENIG (1990); CAVES, R., M. PORTER, A. SPENCE and J. SCOTT (1980); CHAKRAVARTHY, B. (1986); CLARKE, R., S. DAVIES and M. WATERSON (1989); CLARKE, R. (1984); COLLINS, N. and L. PRESTON (1968); COOL, K. and D. SCHENDEL (1986); COOL, K. and D. SCHENDEL (1987); COOL, K. and I. DIERICKX (1993); GRANT, R. and A. JAMMINE (1988); GRINYER, P., P. McKIERNAN and M. YASAI-ARDEKANI (1988); HILL, C. (1985); JACQUEMIN, A. and M. CARDON de LICHTBUER (1973); MARTIN, S. (1979); PHILIPS, L. (1990); RAVENSCRAFT, D. (1983); SCHEFCZYK, M. (1993); SCHMALENSEE, R. (1989); WHITTINGTON, G. (1980)

#### **Business Unit Level - Price Cost Margin**

CAPON, N., FARLEY J. and S. HOENIG (1990); CAVES, R., M. PORTER, A. SPENCE and J. SCOTT (1980); CHAPPEL, H., W. MARKS. and I. PARK (1983); CHOU, T. (1988); COLLINS, N. and L. PRESTON (1968); COLLINS, N. and L. PRESTON (1969); CONTINI, B. (1989); COWLING, K. and M. WATERSON (1976); DE GHELLINCK, E., P. GEROSKI and A. JACQUEMIN (1988); DE MELO, J. and S. URATA (1986); DOMOWITZ, I., R. HUBBARD. and B. PETERSEN (1986); ESPOSITO, F. and L. ESPOSITO (1977); FEINBERG, R. (1980); GEROSKI, P. (1981); GEROSKI, P. (1982); GEROSKI, P. (1990); GUPTA, V. (1983); HOUSE, W. (1973); HUTCHINSON, R. (1981); HUVENEERS, C. and P. VAN CAUWENBERGE P. (1978); JACQUEMIN, A., E. DE GHELLINCK and C. HUVENEERS (1980); KESSIDEZS, I. (1990); KWOKA, J. (1977); KWOKA, J. (1979); LAFRANCE, V. (1979); LEVY, D. (1984); LONG, W. and D. RAVENSCRAFT (1984); LUSTGARTEN, S. (1975); MACHIN, S. and J. VAN REENEN (1993); MARTIN, S. (1979); MARTIN, S. (1979); MARTIN, S. (1988); MARTIN, S. (1988); MARVEL, H. (1980); MUELLER, W. and D. GREER (1984); NEWMAN, H. (1978); PAGOULATOS, E. and R. SORENSEN (1976); QUALLS, P. (1979); RAVENSCRAFT, D. (1983); REEKIE, W. (1984); RHOADES, S. and J. CLEAVER (1973); RHOADES, S. (1974); ROUND, D. (1983); STEER, P. and J. CABLE (1978); STRICKLAND, A., and L. WEISS (1976); VANLOMMEL, E. and B. DE BRABANDER (1979); VANLOMMEL, E., B. DE BRABANDER and D. LIEBAERS (1976); WINN, D. (1977)

#### **Business Unit Level - Growth in Price Cost Margin**

SLEUWAEGEN, L. and H. YAMAWAKI (1988)

#### **Business Unit Level - Profit Level**

BAIN, A. and J. EVANS (1973); CAPON, N., FARLEY J. and S. HOENIG (1990); HILLER, J. (1978); HURDLE, G. (1974); QUALLS, P. (1972); WEINER, N. and T. MAHONEY (1981)

#### **Business Unit Level - Growth in Profits**

BUCKLEY, P., J. DUNNING and R. PEARCE (1984); LAFUENTE, A. and V. SALAS (1989)

#### **Business Unit Level - Relative Profit Level**

HOLL, P. and J. PICKERING (1991)

#### **Business Unit Level - Growth in Earnings per Share**

HILL, C. (1985)

**Business Unit Level - Price above Average Cost**

CLARKE, R. (1984)

**Business Unit Level - Cashflow**

CAPON, N., FARLEY J. and S. HOENIG (1990); HILLER, J. (1978)

**Business Unit Level - Cashflow/Equity**

ADAMS, W. (1977); BALASSE, A. (1990); JACQUEMIN, A. and E. DE GHELLINCK (1978); JEGERS, M. (1987); VANLOMMEL, E., B. DE BRABANDER and D. LIEBAERS (1976)

**Business Unit Level - Cashflow/Total Assets**

ADAMS, W. (1977); JEGERS, M. (1987); JENNY F. and A.-P. WEBER (1974); MAIRESSE, J. and P. CUNEO (1985); OOGHE, H. and W. DE GROOTE (1983); SCHMALENSEE, R. (1989); WHITTINGTON, G. (1980)

**Business Unit Level - Cashflow/Sales**

BALASSE, A (1986); BUZZELL, R. and B. GALE (1987); ENCAOUA, D. and B. FRANCK (1980); MAIRESSE, J. and P. CUNEO (1985); SCHMALENSEE, R. (1989); SHAPIRO, D. (1983); VANLOMMEL, E., B. DE BRABANDER and D. LIEBAERS (1976)

**Business Unit Level - Z-Factor**

CHAKRAVARTHY, B. (1986)

**Business Unit Level - Tobin's Q**

CHARREAUX, G. (1991); SHEPHERD, W. (1986); SMIRLOCK, M., T. GILLIGAN and W. MARSHALL (1984); STEVENS, J. (1990)

**Business Unit Level - Marris V**

CHARREAUX, G. (1991)

**Business Unit Level - Market Value**

CONRAD, G. and I. PLOTKIN (1968); COOTNER, P. and D. HOLLAND (1970)

**Business Unit Level - Market Value/Equity**

CHAKRAVARTHY, B. (1986); CHARREAUX, G. (1991); ORNSTEIN, S. (1972)

**Business Unit Level - Market Value/Sales**

CONNOLLY, R. and S. SCHWARTZ (1985); THOMADAKIS, S. (1977)

**Business Unit Level - Stock Price**

BUHNER, R. (1987); BUZZELL, R. and B. GALE (1987); MILES, G., C. SNOW and M. SHARFMAN (1993); MONTGOMERY, C. and B. WERNERFELT (1991)

**Business Unit Level - Other Market Based Concepts**

BUZZELL, R. and B. GALE (1987); CAPON, N., FARLEY J. and S. HOENIG (1990); CHARREAUX, G. (1991); EIJGENHUIJSEN, H. and L. DE MAN (1976); GABET, G. (1978); PETREI, A. (1973); VAN HERCK, G. (1981); WEINER, N. and T. MAHONEY (1981)

#### **Business Unit Level - Value Added**

DAEMS, H. and P. VAN de WEYER (1993); DE WOLF, P. (1982); GRONHAUG, K. and FREDRIKSEN, T. (1988)

#### **Business Unit Level - Growth in Value Added**

BALASSE, A. (1990); CHOU, T. (1988); DE WOOT, P. and HEYVAERT H. (1979)

#### **Business Unit Level - Excess Capacity**

BANKER, R., H.-H. CHANG and S. MAJUMDAR (1993); ESPOSITO, F. and L. ESPOSITO (1974); ESPOSITO, F. and L. ESPOSITO (1979); MANN, H., J. MEEHAN and G. RAMSEY (1979)

#### **Business Unit Level - Productivity**

ADAMS, W. (1977); BANKER, R., H.-H. CHANG and S. MAJUMDAR (1993); BARNEY, J. and R. HOSKISSON (1990); CAVES, R., M. PORTER, A. SPENCE and J. SCOTT (1980); CAVES, R. (1974); LAFUENTE, A. and V. SALAS (1989); MAIRESSE, J. and P. CUNEO (1985); SCHEFCZYK, M. (1993)

#### **Business Unit Level - Fixed Assets/Employee**

ADAMS, W. (1977)

#### **Business Unit Level - Slack**

CHAKRAVARTHY, B. (1986)

#### **Business Unit Level - Sales**

BARNEY, J. and R. HOSKISSON (1990); BASS, F. and D. WITTINK (1975)

#### **Business Unit Level - Growth of Sales**

ADAMS, W. (1977); BANKER, R., H.-H. CHANG and S. MAJUMDAR (1993); BUCKLEY, P., J. DUNNING and R. PEARCE (1984); CHOU, T. (1988); COOL, K. and I. DIERICKX (1993); FRAZIER, C. and R. HOWELL (1983); GRINYER, P., P. McKIERNAN and M. YASAI-ARDEKANI (1988); HILL, C. (1985); HOLL, P. and J. PICKERING (1991); JACQUEMIN, A. and M. CARDON de LICHTBUER (1973)

#### **Business Unit Level - Market Share**

COCKERILL, A. (1977); COOL, K. and D. SCHENDEL (1987); GRONHAUG, K. and FREDRIKSEN, T. (1988); KIMURA, Y. (1990); MARTENS, R. (1988)

#### **Business Unit Level - Growth of Market Share**

MARTENS, R. (1988)

#### **Business Unit Level - Weighted Market Share**

COOL, K. and D. SCHENDEL (1987); MARTENS, R. (1988)

#### **Business Unit Level - Advertising**

BARNEY, J. and R. HOSKISSON (1990)

**Business Unit Level - Price**

GEITHMAN, F., H. MARVEL and L. WEISS (1981)

**Business Unit Level - Other Marketing Mix Variable**

BANKER, R., H.-H. CHANG and S. MAJUMDAR (1993)

**Business Unit Level - Growth of Assets**

ADAMS, W. (1977); BALASSE, A. (1990); BUZZELL, R. and B. GALE (1987); INGHAM, K. (1976)

**Business Unit Level - Asset Turnover**

BARNEY, J. and R. HOSKISSON (1990); FRAZIER, C. and R. HOWELL (1983); WHITTINGTON, G. (1980)

**Business Unit Level - R&D**

BARNEY, J. and R. HOSKISSON (1990); CAVES, R., M. PORTER, A. SPENCE and J. SCOTT (1980); DE BONDY, R. L. SLEUWAEGEN and R. VEUGELERS (1988); DE WOOT, P. and HEYVAERT H. (1979)

**Business Unit Level - Wages**

ADAMS, W. (1977); CAVES, R., M. PORTER, A. SPENCE and J. SCOTT (1980); VEUGELERS, R. (1986)

**Business Unit Level - Growth in Employment**

LAFUENTE, A. and V. SALAS (1989)

**Business Unit Level - Employee Unrest**

ENDERWICK, P. and P. BUCKLEY (1983)

**Business Unit Level - Trade Union Organization**

CAVES, R., M. PORTER, A. SPENCE and J. SCOTT (1980)

**Business Unit Level - Bargaining Power of Union**

VEUGELERS, R. (1986)

**Business Unit Level - Reputation with Stakeholders**

CHAKRAVARTHY, B. (1986)

## References

### *Books*

- BAIN, J. S.: Essays on price theory and industrial organization, Boston, 1972, 227 p.
- COOPER, L. and M. NAKANISHI: Market-Share Analysis, Evaluating Competitive Marketing Effectiveness, Kluwer, Boston, 1988, 280 p.
- DAEMS, H.: Designing a Competitive Strategy, Concepts and Tools, K.U.Leuven, 1996, 76 p.
- DAEMS, H. and S. DOUMA: Concurrentiestrategie en Concernstrategie, Kluwer Bedrijfswetenschappen, Deventer, 1989, 311 p.
- DOUMA, S.: Ondernemingsstrategie, Kluwer Bedrijfswetenschappen, Deventer, 1993, 370 p.
- GHEMAWAT, P.: Commitment: The Dynamic of Strategy, The Free Press, New York, 1991, 178 p.
- GRANT, R.: Contemporary Strategy Analysis. Concepts, Techniques, Applications, Blackwell Publishers, Cambridge, 1991, 594 p.
- HAX, A. and N. MAJLUF: The Strategy Concept and Process: A Pragmatic Approach, Prentice-Hall International, Englewood Cliffs, New Jersey, 1991, 430 p.
- HOFER, C. and D. SCHENDEL: Strategy Formulation: Analytical Concepts, West Publishing Co., St. Paul, 1978, 219 p.
- JOHNSON, G. and K. SCHOLES: Exploring Corporate Strategy, Text and Cases, Third Edition, Prentice Hall, Hemel Hempstead, 1993, 733 p.
- LEVY, H. and M. SARNAT: Capital Investment & Financial Decisions, Fourth Edition, Prentice-Hall, New York, 1990, 711 p.
- MUELLER, D. and J. CUBBIN: The Dynamics of Company Profits: An International Comparison, Cambridge University Press, Cambridge, 1990, 216 p.
- NAERT, P. and P. LEEFLANG: Building Implementable Marketing Models, Martinus Nijhoff, Leiden, 1978, 406 p.
- OOGHE, H. and Ch. VAN WYMEERSCH: Financiële analyse van ondernemingen, Theorie en toepassing op de jaarrekening, Boekdeel 2, Vijfde druk, Kluwer, Antwerpen, 1991, 112 p.
- PORTER, M.E.: Competitive Advantage, Creating and Sustaining Superior Performance, The Free Press, New York, 1985, 557 p.
- QUINN, J.B., H. MINTZBERG and R. JAMES: The Strategy Process, Concepts, Contexts, and Cases, Prentice-Hall International, Englewood Cliffs, New Jersey, 1988, 998 p.
- SCHERER, F. and D. ROSS: Industrial Market Structure and Economic Performance, Houghton Mifflin Company, Boston, 1990, 713 p.
- SCHMALENSEE, R. and R. WILLIG: Handbook of Industrial Organization, North-Holland, Amsterdam, 1989, Volume 2, 952-1555 p.
- SIMONS, R.: Performance Measurement & Control Systems for Implementing Strategies, Text and Cases, Prentice Hall, New Jersey, 2000, 780 p.



## *Articles*

ANTHONY, R.: Accounting Rates of Return: Note, *The American Economic Review*, March 1986, Vol. 76, No. 1, pp. 244-246

BAIN, J.: Relation of Profit Rate to Industry Concentration: American Manufacturing, 1936-1940, *Quarterly Journal of Economics*, Vol. 65, No. 3, August 1951, pp. 293-324

BENSTON, G.: The Validity of Profits-Structure Studies with Particular Reference to the FTC's Line of Business Data, *The American Economic Review*, Vol. 75, No. 1, March 1985, pp. 37-67

BUIJINK, W. and M. JEGERS: Accounting Rates of Return, *The American Economic Review*, Vol. 79, No. 1, March 1989, pp. 287-289  
CAMPBELL, D.T. and D.W. FISKE: Convergent and Discriminant Validation by the Multitrait-Multimethod Matrix, *Psychological Bulletin*, Vol. 56, No. 2, March 1959, pp. 81-105

CHAKRAVARTHY, B.: Measuring Strategic Performance, *Strategic Management Journal*, Vol. 7, No. 5, September-October 1986, pp. 437-458

CHARREAUX, G.: Structures de propriété, relation d'agence et performance financière, *Revue Economique*, Vol. 42, No. 3, May 1991, pp. 521-552

DAVIS, E. and J. KAY: Assessing Corporate Performance, *Business Strategy Review*, Vol. 1, No. 2, Summer 1990, pp. 1-16

DAVIS, E., S. FLANDERS and J. STAR: Who Are the World's Most Successful Companies?, *Business Strategy Review*, Vol. 2, No. 2, Summer 1991, pp. 1-33

DAVIS, E. and J. STAR: The World's Best Performing Companies, *Business Strategy Review*, Vol. 4, No. 2, Summer 1993, pp. 1-16

FISHER, F.: The Misuse of Accounting Rates of Return: Reply, *The American Economic Review*, Vol. 74, No. 3, June 1984, pp. 509-517

FISHER, F. and J. MCGOWAN: On the Misuse of Accounting Rates of Return to Infer Monopoly Profits, *The American Economic Review*, Vol. 73, No. 1, March 1983, pp. 82-97

HATTEN K. and D. SCHENDEL: Heterogeneity within an Industry: Firm Conduct in the U.S. Brewing Industry, 1952-1971, *The Journal of Industrial Economics*, Vol. 26, No. 2, December 1977, pp. 97-113

HOROWITZ, I.: The Misuse of Accounting Rates of Return: Comment, *The American Economic Review*, Vol. 74, No. 3, June 1984, pp. 492-493

JACOBSON, R.: The Validity of ROI as a Measure of Business Performance, *American Economic Review*, Vol. 77, No. 3, June 1987, pp. 470-478

LONG, W. and D. RAVENSCRAFT: The Misuse of Accounting Rates of Return, *The American Economic Review*, Vol. 74, No. 3, June 1984, pp. 494-500

MANCKE, R.: Causes of Interfirm Profitability Differences: A New Interpretation of the Evidence, *The Quarterly Journal of Economics*, Vol. 88, No. 2, May 1974, pp. 181-194

MARTIN, S.: The Misuse of Accounting Rates of Return: Comment, *The American Economic Review*, Vol. 74, No. 3, June 1984, pp. 501-508

- McFARLAND, H.: Evaluating  $q$  as an Alternative to the Rate of Return in Measuring Profitability, *The Review of Economics and Statistics*, Vol. 70, No. 4, November 1988, pp. 614-622
- McGUIRE, J., T. SCHNEEWEIS and J. HILL: An Analysis of Alternative Measures of Strategic Performance, in: *Advances in Strategic Management*, Vol. 4, JAI Press Inc., 1986, pp. 127-154
- MINTZBERG, H.: Five Ps for Strategy, *California Management Review*, Vol. 30, No. 1, Fall 1987, pp. 11-24
- PORTER, M.E.: From Competitive Advantage to Corporate Strategy, *Harvard Business Review*, Vol. 67, No. 3, May-June 1987, pp. 43-59
- PORTER, M.E.: Towards a Dynamic Theory of Strategy, *Strategic Management Journal*, Vol. 12, Special Issue, Winter 1991, pp. 95-117
- SALAMON, G.: Accounting Rates of Return, *American Economic Review*, Vol. 75, No. 3, June 1985, pp. 495-504
- SALAMON, G.: Accounting Rates of Return: Reply, *The American Economic Review*, Vol. 79, No. 1, June 1989, pp. 290-293
- SCHERER, F., W. LONG, S. MARTIN, D. MUELLER, G. PASCOE, D. RAVENSCRAFT, J. SCOTT and L. WEISS: The Validity of Studies with Line of Business Data: Comment, *The American Economic Review*, Vol. 77, No. 1, March 1987, pp. 205-217
- SCHWALBACH, J., U. GRASSHOFF and T. MAHMOOD: Dynamics of Corporate Profits, *European Economic Review*, Vol. 33, No. 8, 1989, pp. 1625-1639
- SHEPHERD, W.: Tobin's  $q$  and the Structure Performance Relationship, *American Economic Review*, Vol. 76, No. 5, 1986, pp. 1205-1210
- SMIRLOCK, M., T. GILLIGAN and W. MARSHALL: Tobin's  $q$  and the Structure-Performance Relationship: Reply, *The American Economic Review*, Vol. 76, No. 5, December 1986, pp. 1211-1213
- STEELE, A.: A Note on Estimating the Internal Rate of Return from Published Financial Statements, *Journal of Business Finance & Accounting*, Vol. 13, No. 1, Spring 1986, pp. 1-13
- STEVENS, J.: Tobin's  $Q$  and the Structure Performance Relationship: Comment, *American Economic Review*, Vol. 80, No. 3, June 1990, pp. 618-623
- THOMADAKIS, S.: A Value Based Test of Profitability and Market Structure, *Review of Economics and Statistics*, Vol 59, No. 2, May 1977, pp. 179-185
- van BREDA, M.: The Misuse of Accounting Rates of Return: Comment, *The American Economic Review*, Vol. 74, No. 3, June 1984, pp. 507-508
- VANLOMMEL, E., B. DE BRABANDER and D. LIEBAERS: Sectorstructuur en sectoriële verschillen in financiële resultaten, groei- en financiële structuur van industriële ondernemingen, *Economisch en Sociaal Tijdschrift*, Jaargang 30, Nr. 3, juni 1976, pp. 417-426
- VENKATRAMAN, N.: The Concept of Fit in Strategy Research: Toward Verbal and Statistical Correspondence, *Academy of Management Review*, Vol. 14, No. 3, July 1989, pp. 423-444
- VENKATRAMAN, N. and V. RAMANUJAM: Measurement of Business Performance in Strategy Research: A Comparison of Approaches, *Academy of Management Review*, Vol. 11, No. 4, October 1986, pp. 801-814

WERNERFELT, B. and C. MONTGOMERY: Tobin's Q and the Importance of Focus in Firm Performance, *American Economic Review*, Vol. 78, No. 1, March 1988, pp. 246-250

• *Dissertations*

JEGERS, M.: Intrasectoriële resultatendifferentie, sectorieel risico en ondernemingsrisico: Proeve tot verfijning van de meting en evaluatie der onderlinge verbanden, Proefschrift, Rijksuniversiteit Gent, 1987.

MARTENS, R.: Strategic Group Formation and Performance Implications, The Case of the Pharmaceutical Industry in Five E.C.-Countries, 1978-1985, Doctoral Dissertation, UFSIA Antwerp, 1988, 402 p.

VANLOMMEL E., B. DE BRABANDER, D. LIEBAERS and G. THIERS: Verklaring van verschillen in financiële structuur en -resultaten van industriële ondernemingen in België, Rijksuniversitair Centrum Antwerpen, Leerstoel Bedrijfsbeheer, 1975, 171 p.

• *Working Papers*

STEELE, A.: Further Notes on Estimating Economic Returns from Published Accounting Statements, WP University of Warwick, April 1993, 15 p.