

**THE RELATIONSHIP BETWEEN MANAGEMENT ACCOUNTING SYSTEMS,
FIRM STRATEGY, PERCEIVED ENVIRONMENTAL UNCERTAINTY,
NETWORKING, CEO CHARACTERISTICS AND PERFORMANCE IN SMEs¹**

Ann Jorissen

University of Antwerp – UFSIA – RUCA Faculty of applied Economics,
Department of Accounting and Finance, Prinsstraat 13, B-2000 Antwerp, Belgium,
Phone + 32 3 220 40 92, Fax + 32 3 220 47 99,
E-mail: ann.jorissen@ua.ac.be

Eddy Laveren

University of Antwerp – UFSIA – RUCA Faculty of applied Economics,
Department of Accounting and Finance, Prinsstraat 13, B-2000 Antwerp, Belgium,
Phone + 32 3 220 40 86, Fax + 32 3 220 47 99,
E-mail: eddy.laveren@ua.ac.be

Rudy Martens

University of Antwerp – UFSIA – RUCA Faculty of applied Economics,
Department of Management, Prinsstraat 13, B-2000 Antwerp, Belgium,
Phone + 32 3 275 50 56, Fax + 32 3 220 47 99,
E-mail: rudy.martens@ua.ac.be

Anne-Mie Reheul

University of Antwerp – UFSIA – RUCA Faculty of applied Economics,
Department of Accounting and Finance, Prinsstraat 13, B-2000 Antwerp, Belgium,
Phone + 32 3 220 40 45, Fax + 32 3 220 47 99,
E-mail: anne-mie.reheul@ua.ac.be

¹ We would like to thank the Fund for Scientific Research Flanders for its financial assistance (project number G.0186.00N)

Introduction

The research presented in this paper builds further on prior contingency research in relation to management accounting systems (MASs) applied by firms.

Contingency research, examining the relationship between the design and use of MASs, an outcome variable like company performance and contingent variables like strategy, firm dimension, perceived environmental uncertainty (PEU) has been on the agenda for several years already. This contingency research usually focused on large enterprises. The focus of this study, however, is on SMEs. SMEs are important to study as the large majority of firms in western economies, including Belgium, are SMEs, and as such they are very important to the general economic well being. Further, the nature, role and development of management accounting is more visible to the researcher in the case of SMEs as a consequence of their small size. This enhanced visibility, combined with the susceptibility of the SME to key contingencies such as extreme competitive pressures, provides an environment in which the effects of fundamental forces are marked and can therefore be studied more easily. The results of SME research can then be contrasted with empirical results from large enterprises. Finally, the absence, in many instances, of professional accounting support in SMEs results in information provision, which is derived purely from managerial demand. Consequently the SME setting provides unique and pure insight into managerial information needs (Mitchell et al, 1998). Our data result from a large-scale survey to which 824 SMEs responded.

The contingent or moderating variables studied in the context of large enterprises are usually PEU, strategy, dimension and industry. The majority of prior research on SME databases analyzed the relationship between MASs and performance, considering the moderating effect of only one contingent variable at the time. In this study we investigated the influence of more contingent variables simultaneously. We studied the relationships between MAS formality, PEU, strategy, CEO education, involvement in networks, size, industry and company performance with the use of a systems approach. Through cluster analysis a search for multiple fits within the data was undertaken. Our aim was to find systems of fit between MASs, PEU and strategy; and to determine performance differences between these different systems of fit. In a further step, we conducted our analyses separately for firms in different industries and for firms with different dimensions, in order to find out whether the findings for the whole sample were consistent across these subgroups. The variables 'engagement in networks' and 'CEO education' were included for different reasons. The involvement in networks is a rather novel study subject and not yet widely investigated in the context of SMEs. Further, CEO characteristics were included because the influence of the CEO in the context of a SME is much bigger than the impact of a CEO on a large enterprise.

Further we notice that the few contingency studies, which have been performed in the area of SMEs, had to rely often on subjective performance data (appreciation of company performance by respondent). In this study company performance data taken from the published annual accounts were used.

The results of the bivariate analysis learn that the following characteristics are associated: formal MASs, low PEU, prospector/analyzer strategy, large firm size, strong engagement in networking and high CEO education. This association holds within the whole sample and within the manufacturing industry. Within the trade and service industry some of those associations became insignificant. The cluster analyses consistently revealed the same fits for all firm dimensions and industry subgroups. A first pattern of fit is characterized by high short- and long-term planning formality, a rather prospective strategy and a low PEU. Further these companies are characterized by strong

engagement in networking and highly educated CEOs. The second pattern of fit demonstrates the opposite characteristics, namely a low short- and long-term planning formality, a rather defensive strategy and a high PEU. Further this system of fit demonstrates a weak engagement in networking practices and less educated CEOs. In most subgroups, the first pattern of fit is characterized by realized high growth levels, and the second by low growth levels. Further the data provide evidence for the fact that the relationship between MAS formality and performance could be bi-directional. Not only does planning seem to have an influence on performance. Weak performance can also lead to formal short-term planning in an attempt to solve the problems.

This paper is organized along the following lines. In part one a literature overview is presented. Part two presents the research data and the methodology used. Part three presents the research results.

1. Literature Review

As mentioned in the introduction, the subject of this study is to gain more insight into the relation between the use and design of MASs and company performance, taking into account the influence of strategy, PEU and other firm characteristics in the context of SMEs. The data for this empirical research are survey based. After a literature review, questions relating to the following subjects were included in the survey: the strategy of the firm (Miles and Snow typology), PEU, the different types of long- and short-term plans used, the formality of the planning process or the absence of it, the use of financial and non-financial performance indicators, the use of incentive systems, the participation in networks and several CEO characteristics. The survey was further completed with questions related to different firm characteristics like family character, company independence, growth motives,.... An overview of the survey elements used in the empirical research included in this paper is presented in the appendix.

The relevant literature will be briefly summarized below. The literature overview is categorized according to the variables considered. The literature review addresses the results of empirical research undertaken within large companies as well as within SMEs. This implies that not all the findings discussed below apply automatically for SMEs.

- MAS and company performance

For the last decades the relationship between MAS and performance has been the subject of numerous empirical studies, also in the context of SMEs. These universalistic studies investigate a unidirectional relationship between planning systems and company performance. This research in SMEs yielded mixed results. Empirical evidence has been provided with regard to a positive correlation (Lyles et al., 1993, Chaganti and Schmeer, 1994, Robinson, 1982; Bracker, Keats en Pearson, 1988; Masurel en Smith, 2000; Schwenk en Schrader, 1993) whereas other studies did not find any significant correlation (Robinson en Pearce II, 1983; Cragg en King, 1988; Risseuw en Masurel, 1994; Gadenne, 1998) or even a negative correlation (Fredrickson en Mitchell, 1984). The argument of Otley (1980) that contingent theoretic approaches in management accounting emerged from the need to reconcile conflicting empirical findings based on universalistic theoretical models applies here.

As a consequence of this insight the question is no longer “does MAS influence the performance of firms?” but evolves to “under what circumstances could MASs contribute to firm performance?”. In the context of large firms the relation between MAS and company performance is often studied in combination with the moderating effect of

several contingent variables. Contingent variables can be: size and life cycle stage of the firm, PEU, the type and structure of the industry, the company strategy, the firm complexity, the management expertise and the characteristics of the entrepreneur.

- PEU, strategy and company performance

According to the literature, managers cope with environmental uncertainty through the choice of an appropriate strategy and the design of a matching structure (i.e. an information processing system like MAS, MIS, ...)(Andrews, 1971; Ansoff, 1979; Shendel and Hofer, 1979). The alignment of an organization's strategic orientation to its environment is of paramount importance for the business success (Chaganti, Chaganti and Mahajan, 1989; Miller and Friesen, 1983; Venkatraman and Prescott, 1990). Defender strategies have been found to be appropriate in stable environments where the benefits of efficiency based competitive advantages are more likely to be realized. In a dynamic environment prospector strategies are more likely to create sustainable competitive advantage (Kim and Lim, 1988, 2001; Miller, 1988; Tan, 1996). Miles and Snow (1978), on the other hand, suggested that in any industry the various innovative types in their typology would exist, and with the exception of reactors, be equally effective. Without considering the performance effect, Khandwalla (1976), Paine and Anderson (1977) and Luo (1999) found that strategic managers in more uncertain environments tend to be more proactive, innovative and risk-taking.

- PEU, MAS and company performance

Besides an appropriate strategy, organizations need a structure (i.e. an information processing system) capable of accommodating the variability and uncertainty of their environment. Organizational effectiveness is a function of the correctness of 'fit' between the information system of an organization and its environment (Burns and Stalker, 1961; Hage and Aiken, 1970; Lawrence and Lorsch, 1969; Lorsche and Morse, 1974). Conflicting results have been found in this area. Generally it is believed that low environmental uncertainty encourages the development of mechanistic structures that emphasize formal controls, centralized decision making and specialization of activities (Burns and Stalker, 1961; Tung, 1979). In an uncertain environment an organic structure, with its low degree of formality, decentralized decision-making and less specialization, is best suited (Miller, 1986; Brownell, 1985; Fredrickson and Mitchell, 1984; Lawrence and Dyer, 1983). Ezzamel (1990), Imoisili (1985) and Otley (1978), however, found that hostile and turbulent conditions are best served by a reliance on formal MAS. Regardless of the performance effect, Lindsay and Rue (1980) and Schrader et al. (1989) found for respectively large and small firms that there is a positive relationship between environmental uncertainty and planning formality. Matthews and Scott (1995) found the opposite result for small firms.

- MAS, strategy and company performance

Strategic management researchers also suggest that an optimal strategy-structure match will give higher performance (Miller, 1986). Most studies that explored the association between MAS and strategic typologies found that defender (conservative, cost leadership) strategies are more associated and served by centralized and formalized MAS than prospector strategies (Simons, 1987; Dent, 1990; Chenhall and Morris, 1995). Prospectors need decentralized, informal and flexible structures to encourage innovation. Irrespective of the performance effect Freel (2000), however, found that innovators tend to more internal control.

- Networks

To be able to make sound decisions concerning the appropriate strategy and structure, managers need information regarding their firm's external environment. Therefore they need to develop mechanisms to scan the environment (Daft and Weick, 1984). An important element of the scanning mechanism for entrepreneurs is the development and maintenance of a web of personal networks (Johannisson, 1996; Ostgaard and Birly, 1994). Networking activities enable the firm to formulate a competitive strategy congruent with critical environmental conditions (Beal, 2000; Daft, Sormunen and Parks, 1988; Hambrick, 1982). There is empirical evidence that networking activities with external stakeholders are beneficial (Van de Ven, Hudson and Schroeder, 1984; Jarillo, 1989), although some studies failed to find an indication of effectiveness of such activities (Birley, 1985; Carsrud, Gaglio and Olm, 1987, Johannisson, 1996; Ostgaard and Birley, 1996). The literature also suggests that the perceived level of environmental uncertainty may influence the importance of networking characteristics (Daft, et al., 1988; Rhyne, 1985; Sawyerr, 1993; Sormunen et al., 1985). That is, the higher the level of uncertainty perceived in the environment, the greater the scanning activity. Sawyerr and McGee (1999) found that this relationship was more pronounced for small companies than for larger companies. Further Tyler, Bettenhausen and Daft (1989) found that executives use more networking information in formulating prospector-oriented strategies than defender-oriented strategies.

- CEO characteristics

Much of the current research develops theory and empirically tests models based on the notion that strategy should 'fit' with a variety of organizational and environmental constructs in order to result in superior performance (Barney, 1986; Covin, 1991; Hamilton and Shergill, 1992; Neilsen, 1992). However, few studies have considered the organizational and environmental factors that precede the adoption of a given strategy. The promise that strategy must "fit" with organizational or environmental factors to be effective may be incomplete. A strategy - to be successful - should also fit with the psychological characteristics and functional experiences of managers responsible for its formulation and implementation (Parnell, Lester and Menefee, 2000; Beal and Yasai-Ardekam, 2000). Since our research focuses on SMEs, and as we assume that the impact of a CEO is much bigger in a small organization than in a large organization, we considered several CEO characteristics: CEO education (level and type of educational degree) and CEO experience (experience through self-employed parents, years of experience in the current or other firms, years of experience as director).

- Firm size and industry

In our study we examined the manufacturing and trade industry separately because Ginsberg, Venkatraman (1985) and Datta (1980) recommended studying individual industries. Further, moving from one industry to another may cause problems in terms of comparability among measures of strategy (Snow and Hambrick, 1980), perceptions of environmental instability, munificence and complexity (Sutcliffe and Huber, 1998) and measures of performance (differences in industry norms) (Child, 1974).

We also decided to perform the cluster analyses for different firm dimensions separately. This is because large and small firms differ with respect to the availability of resources and the internal differentiation. Larger companies generally have greater available resources, which enables them more to engage in planning (Fredrickson and Mitchell, 1984). Further, larger firms are generally more complex which makes planning tools more critical for integration and control (Miller and Cardinal, 1994).

2. Research Data and Methodology Used

As the published empirical research in the literature revealed contradicting results, we do not put forward a-priori directional relations between MASs, PEU, strategy and other firm characteristics. Nor do we develop hypotheses about the performance differences in relation to these contingent variables. The research presented in this paper can be labelled exploratory contingency research.

Several types of contingency research can be distinguished. According to Chenhall (2001) and Fisher (1995) the following four types can be discerned.

- Linear additive models provide separate arguments for each variable enacting in isolation with no attention to the explicit relationship between the explanatory variables (level 1).
- Interaction models have been the dominant form in contingency research; they are used where the nature or strength of a relationship between MAS and an outcome criterion will depend on the influence of particular aspects of context (moderated regression analysis) (level 2).
- Intervening models involve the specification of causal paths between MAS, context and outcomes. These studies may demonstrate how the relationship between MAS and outcomes are explained by intervening variables (structural equation models)(level 3).
- A fourth form of modelling involves the systems approach which also describes fit, but does so by testing multiple fits simultaneously, involving a wider variety of dimensions of context and MAS. Variation in performance stems from variations in overall systematic fit, with multiple, equally effective alternatives being possible. Techniques to test systems models include the use of Euclidian distance (Selto et al., 1995) and cluster analysis (level 4).

For the research presented in this paper we have used level 1 and level 4 contingency research approaches. Level 1 was used to gain insight into the association levels between the different variables and level 4 was used to analyze the fit of different variables in the context of SMEs. The latter approach is also supported by David Otley (1980) as he states that: “It is explicitly recognized that AIS (accounting information system) design, MIS design, organizational design and other control arrangements of the organization form a package which can only be evaluated as a whole. In particular there are extensive interdependencies between AIS design and each of the other components of the package”.

Research population and data collection

Early 2001 a large-scale survey was undertaken. The population to be targeted for the survey was constructed along the following lines. Based on size, industry and location of all firms in the Flanders region of Belgium that have published financial statements over the years 1993-1999, a three dimensional matrix was designed. In a second step 10% of that population was chosen at random according to the percentages of the three dimensional matrix (21 640 companies). Within that group all companies with at least five full time employees received a questionnaire (8 367 companies). This implies that start-ups and micro-firms are excluded from the study. We received 896 filled-out questionnaires of which 57 anonymous. The latter could not be linked to the company performance data taken from the annual accounts and were not used. This resulted in 839 usable responses. This represents a response rate of 10.03 %. Since we restricted our research to SMEs, 15 large companies (more than 500 employees) among the 839

respondents were not included in this analysis. Our research population in this paper consists of 824 SMEs with more than 5 and less than 500 full time employees.

Profile of respondents

Table 1 presents the characteristics of the respondent firms. The largest proportion of firms is found in the manufacturing and trade industries. With respect to firm size, the majority of the respondent firms are firms, which count less than 50 full-time employees. Concerning strategy type, about 33% of our respondents follow a defender strategy. The next important strategy type is the prospector strategy adopted by 29.0% of the respondent SMEs. Further the large majority of respondent SMEs are independent firms. Given the high percentage of independent firms and the fact that only firms located in the Flanders region of Belgium received a survey, we are convinced that cultural differences do not play a significant role in our population.

Table 1: profile of respondents

Industry	<i>Manufacturing</i>	<i>Trade</i>	<i>Services</i>		Total
	406 49.3%	328 39.8%	90 10.9%		824 100.0%
Employment	<i>5-10 FTE</i>	<i>10- 25FTE</i>	<i>25- 50 FTE</i>	<i>50- 500 FTE</i>	Total
	247 30.0%	305 37.0%	166 20.1%	106 12.9%	824 100.0%
Strategy type	<i>Prospector</i>	<i>Analyzer</i>	<i>Defender</i>	<i>Reactor</i>	Total
	226 29.0%	139 17.8%	271 32.8%	143 18.4%	779 100.0%
Dependency	<i>Independent</i>	<i>Dependent</i>			Total
	698 85.1%	122 14.9%			820 100.0%

In order to investigate the characteristics of the population of respondents in relation to the overall survey population (=8367 companies) we conducted chi square tests. We examined whether differences with regard to employment, asset size, industry, location and growth of the firm exist between the responding firms and the total survey population. Our results revealed that the respondents were significantly ($\alpha < 1\%$) larger with respect to employment and assets. This means that a lower response rate was obtained with regard to smaller companies. This is consistent with other survey research studies. With respect to the other variables however the responding firms were found to have characteristics identical to the total survey population (location, industry and growth). Further statistical analysis on the characteristics of the hundred earliest versus the hundred latest respondents did not reveal the existence of a non-response bias.

Construction of the research variables

MAS formality was captured with the use of eleven variables. Six variables represented long-term MAS formality: the formality of the long-term sales plan, the long-term production plan, the long-term personnel plan, the long-term R&D plan, the long-term investment plan and the long-term financing plan. Further five variables represented short-term MAS formality: the formality of the sales budget, the production budget, the cost budget, the investment budget and the liquidity budget. MAS formality was measured on a four-point scale with 1: no planning, 2: intuitive planning, 3: informal

planning and 4: formal planning. Responses to these questions were averaged to obtain an overall score for short-term MAS formality and long-term MAS formality. Thus higher values represent more formal planning. Variables regarding control practices were constructed by adding up the number of financial and non-financial performance indicators used.

In this study profitability and growth were used as firm performance variables. They were approximated using the seven-year average gross ROA and the six-year average yearly growth of employment over the years 1993 - 1999. The justification for the use of seven years of data is that it should reduce the reliability problem inherent in shorter-term measures but at the same time, it is not so out-of-date that it ceases to be relevant. We used the companies' financial statements to calculate the performance variables.

PEU was captured in several ways. First of all by including questions on the predictability of the following environmental elements: customers, suppliers, competitors, technology, government, trade unions, public attitudes and financial markets. Further we questioned the degree of stability of the environment, the degree of market opportunities in the environment and the degree of controllability of the environment. We measured each of these variables on a five-point scale ranging from 1: very high PEU to 5: very low PEU. Responses to these questions were averaged to derive an overall PEU score. A lower score implies a more uncertain environment.

To measure strategy we chose the Miles and Snow (1978) typology (prospector, analyzer, defender, reactor).

For an overview of the operationalizations of the other variables we refer to the appendix.

Research methodology

In a first step level 1 contingency research was conducted. Bivariate significance testing was used to gain insight into how the use of MAS, PEU, firm strategy, firm size, industry, participation in networks and CEO education relate to each other. These tests were run for the whole sample and afterwards separately for the trade, the manufacturing and the service industry.

In the next step the so-called level 4 contingency research was performed (i.e. systems approach). With the use of cluster analysis we tried to find patterns of fit between MAS formality, PEU and strategy. The starting point of this series of cluster analyses was each time our whole dataset of SMEs. In subsequent steps, this dataset was divided into subgroups according to size or to industry. Cluster analyses were then performed on each of these subgroups with a view of examining whether or not the patterns of fit we found in the whole sample, continued to exist in these subgroups. We have used the hierarchical clustering method and have chosen Ward's method to minimize the within-cluster differences. Ward's method has been widely used within the social sciences (Everitt 1993). We used the squared Euclidean distance as proximity measure. To determine the number of clusters we investigated the percentage increases in the agglomeration coefficient. A disadvantage of the use of cluster analysis is that despite attempts made to construct various tests of the statistical reliability of clusters, no fully defensible procedures are currently available. The lack of appropriate tests stems from the difficulty of specifying a realistic null hypothesis. Therefore some authors argue that cluster analyses should be viewed as preclassification techniques. Despite these comments cluster analysis has been used in published research on the way in which accounting techniques, accounting practices and strategic priorities combine (a.o. Chenhall & Langfield-Smith, 1998).

3. Research Results

- **Level 1 contingency research (linear additive models)**

Using bivariate analysis we analyzed the relationship between the use of MAS and the contingent variables firm size, industry, strategy, PEU, CEO education and participation in networks in the context of SMEs. Significance testing has been undertaken on the whole research population and three subpopulations (industry, trade and service).

The influence of perceived environmental uncertainty

Since we know from the literature that PEU is a highly moderating variable we have subdivided each of the four research populations into two groups, namely a group of SMEs which perceive their environment as uncertain (i.e. more uncertain than the median PEU score of the whole sample) and a group which perceives the environment as certain (i.e. less uncertain than the median PEU score of the whole sample).

Table 1: focus - PEU

variables	degree of PEU	Manu- facturing mean	Trade mean	Services mean	Total mean
Strategy type (1: prospector, 4: reactor)	high PEU	2.80 (n=208)	2.80 (n=157)	2.54 (n=37)	2.78 (N= 404)
	low PEU	2.38 (n=187)	2.44 (n=142)	2.21 (n=43)	2.38 (N= 372)
	sign(MW-test)	0.0%	4.7%	20.6%	0.0%
firm size (assets in million euros)	high PEU	4.06 (n=213)	2.89 (n=173)	13.12 (n=43)	4.47 (N=432)
	low PEU	7.49 (n=190)	3.67 (n=153)	16.39 (n=46)	7.04 (N=389)
	sign(MW-test)	0.1%	66.4%	43.1%	0.3%
Education CEO (1: low, 4: high)	high PEU	2.23 (n=208)	2.23 (n=171)	2.86 (n=42)	2.29 (N=424)
	low PEU	2.56 (n=186)	2.23 (n=152)	3.02 (n=46)	2.49 (N=384)
	sign(MW-test)	0.5%	91.9%	58.5%	1.8%
Networking (n° of contacts)	high PEU	4.51 (n=213)	4.84 (n=173)	5.00 (n=43)	4.69 (N=432)
	low PEU	5.26 (n=190)	5.17 (n=153)	5.41 (n=46)	5.24 (N=389)
	sign(MW-test)	0.0%	9.2%	23.6%	0.0%
Networking (n° of activities participated in)	high PEU	2.59 (n=213)	2.50 (n=173)	2.28 (n=43)	2.53 (N=432)
	low PEU	3.04 (n=190)	2.81 (n=153)	2.93 (n=46)	2.94 (N=389)
	sign(MW-test)	0.3%	5.7%	7.2%	0.0%
n° of short- and long-term plans	high PEU	4.67 (n=213)	4.99 (n=173)	5.40 (n=43)	4.87 (N=432)
	low PEU	6.92 (n=190)	5.89 (n=153)	7.07 (n=46)	6.53 (N=389)
	sign(MW-test)	0.0%	3.0%	8.3%	0.0%
n° of formal short- and long-term plans	high PEU	1.39 (n=213)	1.59 (n=173)	2.70 (n=43)	1.60 (N=432)
	low PEU	3.06 (n=190)	2.67 (n=153)	3.57 (n=46)	2.96 (N=389)
	sign(MW-test)	0.0%	0.1%	15.1%	0.0%
n° of financial performance measures	high PEU	6.67 (n=213)	7.13 (n=173)	6.37 (n=43)	6.83 (N=432)
	low PEU	7.73 (n=190)	7.47 (n=153)	7.85 (n=46)	7.64 (N=389)
	sign(MW-test)	0.5%	38.6%	3.0%	0.1%
n° of operational performance measures	high PEU	5.32 (n=213)	4.57 (n=173)	4.33 (n=43)	4.91 (N=432)
	low PEU	6.64 (n=190)	5.20 (n=153)	4.54 (n=46)	5.83 (N=389)
	sign(MW-test)	0.0%	5.2%	41.1%	0.0%

If we focus on the three subpopulations with regard to industry differences (table 1) we notice that within manufacturing firms the differences are all significant. A low PEU corresponds with a prospector strategy, a larger SME, higher CEO education, higher involvement in networking and more planning and control compared to a situation of high PEU. Within trade and service companies some relations become non significant, for example the relation between firm size and PEU. With regard to the education level of the CEO only in manufacturing firms the higher educated CEO perceives the environment as less uncertain. In the trade and service industry the education of the CEO is not

significantly related to the PEU. In the trade industry we observe one more difference, which is not significant: the use of financial performance measures. The use of these performance indicators is not significantly different whether a company perceives the environment as certain or uncertain. In the service industry we only find a few significant differences when taking PEU as a starting point.

In table 2 is shown that in the whole sample the different industries perceive their environment equally (un)certain.

Table 2: focus: PEU

	High PEU	Low PEU	Sign. (χ^2)
n° of firms in manufacturing	216 (52.2%)	198 (47.8%)	67.2%
n° of firms in trade industry	173 (53.1%)	153 (46.9%)	
n° of firms in services industry	43 (47.8%)	47 (52.2%)	

The influence of strategy

The total population of companies with less than 500 employees is divided into two groups. One group consists of companies that follow a defender or reactor strategy and the other group consists of firms that follow a prospector or an analyzer strategy. Table 3 and 4 present the results of the χ^2 ,t and Mann Withney-tests concerning all the variables involved.

Table 3: focus: strategy type

variables	Strategy type	Manu- facturing mean	Trade mean	Services mean	Total mean
PEU (1: high, 5: low)	D/R	2.92 (n=210)	2.92 (n=164)	3.03 (n=36)	2.93 (n=412)
	P/A	3.12 (n=185)	3.12 (n=135)	3.18 (n=44)	3.13 (n=364)
	sign (MW-test)	0.0%	0.2%	13.9%	0.0%
firm size (assets in million euros)	D/R	5.02 (n=211)	2.69 (n=165)	10.42 (n=36)	4.54 (n=414)
	P/A	6.54 (n=186)	4.18 (n=135)	16.25 (n=44)	6.84 (n=365)
	sign (MW-test)	0.0%	0.0%	0.7%	0.0%
education CEO (1:low, 4: high)	D/R	2.14 (n=207)	2.04 (n=163)	2.77 (n=35)	2.16 (n=407)
	P/A	2.67 (n=181)	2.48 (n=134)	3.09 (n=44)	2.65 (n=359)
	sign(MW-test)	0.0%	0.3%	22.8%	0.0%
networking (n° of contacts)	D/R	4.46 (n=211)	4.52 (n=165)	4.53 (n=36)	4.50 (n=414)
	P/A	5.34 (n=186)	5.58 (n=135)	5.70 (n=44)	5.47(n=365)
	sign(MW-test)	0.0%	0.0%	2.1%	0.0%
networking (n° of activities participated in)	D/R	2.47 (n=211)	2.29 (n=165)	2.31 (n=36)	2.39 (n=414)
	P/A	3.16 (n=186)	3.07 (n=135)	2.89 (n=44)	3.09 (n=365)
	sign(MW-test)	0.0%	0.0%	8.5%	0.0%
n° of short- and long-term plans	D/R	4.39 (n=211)	4.21 (n=165)	3.78 (n=36)	4.27 (n=414)
	P/A	7.25 (n=186)	7.01 (n=135)	8.27 (n=44)	7.28 (n=365)
	sign(MW-test)	0.0%	0.0%	0.0%	0.0%
n° of formal short- and long-term plans	D/R	1.34 (n=211)	1.25 (n=165)	1.39 (n=36)	1.31 (n=414)
	P/A	3.15 (n=186)	3.23 (n=135)	4.45 (n=44)	3.33 (n=365)
	sign(MW-test)	0.0%	0.0%	0.0%	0.0%
n° of financial performance measures	D/R	6.29 (n=211)	6.17 (n=165)	6.14 (n=36)	6.24 (n=414)
	P/A	8.17 (n=186)	8.82 (n=135)	7.66 (n=44)	8.35 (n=365)
	sign(MW-test)	0.0%	0.0%	8.1%	0.0%
n° of operational performance measures	D/R	4.71 (n=211)	4.02 (n=165)	3.03 (n=36)	4.29 (n=414)
	P/A	7.39 (n=186)	6.11 (n=135)	5.70 (n=44)	6.72 (n=365)
	sign(MW-test)	0.0%	0.0%	0.0%	0.0%

P/A: prospector / analyzer

D/R: defender / reactor

We observe in table 3 that the results for the total population and for the subpopulations of manufacturing firms and trade firms are almost identical. The defender/reactor strategy type is characterized in both subpopulations by higher PEU, smaller SMEs, lower CEO education, less networking and less involvement in planning and control practices compared to the prospector/analyzer strategy type. In comparison with the previous analysis (focus PEU) we do not observe industry differences between the manufacturing and trade industry. In the service industry less non-significant differences are observed in comparison with the previous analysis (focus PEU).

For the whole sample our data reveal (table 4) that firms in the trade industry adopt less growth-oriented strategies compared to companies in the service industry.

Table 4: focus: strategy type (whole sample)

	Defender/reactor	Prospector/analyzer	Sign. (χ^2)
n° of firms in trade industry	55.0% (135 firms)	45.0% (165 firms)	9.1%
n° of firms in services industry	45.0% (36 firms)	55.0% (44 firms)	

- **Level 4 contingency research (systems approach)**

Through cluster analyses we wanted to discover systems of fit between MAS formality and several contextual variables. In a further step we wanted to investigate the performance differences between the different systems of fit.

Four clustering variables were chosen, namely PEU, strategy, short-term planning formality and long-term planning formality. Our attempt was to find clusters of firms with high within-cluster homogeneity and high between-cluster heterogeneity with respect to MAS formality, PEU and strategy. In this way the different clusters we obtained, represent the different systems of fit. The variables short-term and long-term planning formality, strategy and PEU were chosen as cluster variables for the following reasons: three of them result from management decisions (adopted strategy and formality of planning systems). According to the literature, an important factor in the decision process regarding the strategy to adopt and the formality of MAS systems is the perceived environmental uncertainty. According to Khandwalla (1976) a defender strategy is chosen as a reaction to a benign environment, a prospector strategy is chosen in the opposite circumstance. So, the reason why we chose to include PEU and strategy among the cluster variables is that we believe in dynamic processes of adjustment between environment, strategy and MASs. Business strategies can cope directly with external environments by changing competitive conditions and by influencing the selection of target niches. Strategies and environments can also influence choices of MASs due to particular coordinative and control problems they create. The environments will in turn influence strategies. A central issue of this research is that good performance will be characterized by a good match between strategy, MASs and environment.

The link between the different systems of fit and company performance was analyzed in two different ways. First of all the profitability and growth scores for the resulting clusters were calculated. Second, the profitability and growth variables were included as cluster variables. The results obtained in the second approach did not differ substantially from the results of the first approach. For this reason we only present the results of the first approach in this paper.

Besides PEU and strategy, the literature suggests other contingent variables too (e.g. industry, size, networking, CEO education). Industry and size were not included among the cluster variables, but were accounted for by conducting our analyses separately for firms in different industries and for firms with different dimensions. This enables us to find out whether the obtained clusters for the whole population were consistent across these subgroups. The contingent variables networking and CEO education were calculated for the resulting clusters and as such taken into account.

The starting point of each series of cluster analyses was each time the whole population. In subsequent steps, this population was divided into subgroups according to size or to industry. Cluster analyses were then performed on the subgroups. This approach is suggested in an article by Ittner and Larcker (2000). For exploratory research, Ittner and Larcker note the potential of recursive partitioning to split samples into a sequence of subgroups thereby generating a tree-like structure that describes a nesting of independent variables. Three tree-like structures have been constructed, one based on the whole sample, the second based on industry characteristics and the third driven by dimension characteristics.

A problem of multicollinearity between the cluster variables was only observed between short- and long-term planning formality. To avoid this problem we conducted a principal component analysis with varimax rotation. For the whole sample as well as for the different subgroups this analysis resulted in two uncorrelated factors. A first factor stands for the formality of short-term planning, the second factor for the formality of long-term planning. The factor scores for these two factors were used as cluster variables.

Before constructing the tree-like structures based on industry and firm dimension, we first performed a cluster analysis for the whole population of SMEs. This analysis revealed a two-cluster and a four-cluster solution. Table 5 presents the 2-cluster solution.

Table 5: two-cluster solution - whole population

	Cluster 1 (190 firms) Mean score	Cluster 2 (470 firms) Mean score	Sign. MW-test
ST planning formality	3.46	1.99	0.0%
	‘more formal’	‘less formal’	
LT planning formality	3.06	1.45	0.0%
	‘more formal’	‘less formal’	
PEU	3.46	2.93	0.0%
	‘lower PEU’	‘higher PEU’	
Strategy	1.41	2.85	0.0%
	‘rather prospective’	‘rather defensive’	
Gross ROA	15.78	16.27	ns
Growth value added	15.79	9.79	4.1%
	‘higher growth’	‘lower growth’	
Operational PI	8.33	4.55	0.0%
	‘more operational PIs’	‘less operational PIs’	
Financial PI	9.86	6.28	0.0%
	‘more financial PIs’	‘less financial PIs’	
Variable rewards	1.22	0.50	0.0%
	‘more variable rewards’	‘less variable rewards’	
Networking	2.78	2.43	0.0%
	‘more networking’	‘less networking’	
CEO education	2.95	2.20	0.0%
	‘higher level of education’	‘less educated’	
Size (n° of employees)	57.76	24.72	0.0%
	‘larger’	‘smaller’	

See appendix and ‘Construction of the research variables’ (p.7) for the exact interpretation of the mean scores

Table 6: four-cluster solution - whole population

	C1 (170 firms) Mean score	C2 (159 firms) Mean score	C3 (190 firms) Mean score	C4 (141 firms) Mean score
ST planning formality	1.91	1.45	3.46	2.69
LT planning formality	1.71	1.51	3.06	1.06
PEU	1.91	3.21	3.46	2.94
Strategy	3.46	2.10	1.41	2.96
	‘more defender’		‘more prospector’	
Gross ROA	16.12	17.36	15.78	15.23
Growth value added	10.04	10.28	15.79	8.96
Operational PI	4.37	4.70	8.33	4.60
Financial PI	6.11	6.14	9.86	6.65
Variable rewards	0.56	0.38	1.22	0.55
Networking	2.35	2.42	2.78	2.54
CEO education	2.20	2.17	2.95	2.23
Size (n° of employees)	29.38	19.93	57.76	24.50
			‘large’	

See appendix and ‘Construction of the research variables’ (p.7) for the exact interpretation of the mean scores

With regard to the two-cluster solution, the first cluster reveals the following pattern of fit: a high planning formality, a rather prospective strategy and a low PEU. Further this cluster is characterized by larger firms with high growth rates, that use a high number of performance indicators, are strongly engaged in variable reward systems and networking activities and have highly educated CEOs. The second cluster demonstrates the opposite characteristics. Further, the first cluster contains significantly more service firms, whereas the second cluster contains significantly more manufacturing firms (χ^2 -test, significance level of 1.5%).

Besides the two-cluster solution, we also found a four-cluster solution. If we compare the two-cluster solution with the four-cluster solution, we notice that cluster two, which consisted of the ‘smaller’ firms is split up into three sub clusters. One sub cluster (C2) consisting of the smallest firms. They combine low planning formality with low PEU. The clusters C1 and C4 represent clusters of firms that have more or less the same dimension. We notice that cluster 4 is characterized by a lower PEU, a more prospective strategy and higher short-term planning formality. Analyzing the variables on company performance we notice different patterns. If we consider growth of value added cluster 3 obtains the highest score. However, in relation to gross ROA cluster 3 obtains the weakest performance. Table 7 presents the tree for the whole population.

Next, we will examine the impact of the industry in which companies operate on the pattern of fit between the variables long-term planning formality, short-term planning formality, perceived environmental uncertainty and strategy, profitability and growth. To visualize the results of the cluster analyses, these results will be presented in a tree-like structure.

Tree-like structures built on industry differences

In order to investigate industry differences, the analyses focus on the difference between manufacturing and trade. The tree in table 8 demonstrates the cluster results for the trade and the manufacturing industry.

< insert table 8 here >

This tree reveals that both for the trade and the manufacturing industry the cluster analyses result in two distinct clusters. The two-cluster solutions for trade and manufacturing are almost identical to the two-cluster solution for the whole sample, except that short-term planning formality does not play a role characterizing the clusters in the manufacturing industry. It is important to note that both in the manufacturing and trade industry, the two clusters do not differ with respect to profitability. They do with respect to growth rates

A relevant four-cluster solution could only be distinguished for the manufacturing industry. For the trade industry, however, the analysis of the clustering agglomeration coefficient did not justify another solution than the two-cluster solution. The four-cluster solution for the manufacturing industry constitutes a further subdivision of its two-cluster solution. In the four-cluster solution the size variable steps out. A larger dimension goes together with more planning formality. Performance differences are finally found. The firms in cluster C achieve higher growth rates and profitability than the companies in cluster D, which have a weak growth and profitability performance. The smaller firms with less planning formality obtain higher performance levels.

Tree-like structures built on firm size differences

In a next step the patterns of fit of the variables short- and long-term planning formality, PEU and strategy are examined for different firm dimensions. We will discuss and compare the cluster results of the following subgroups: companies with 5 to 10 employees (FTE), companies with more than 10 to 25 employees, firms with more than 25 to 50 employees and finally firms with more than 50 to 500 employees. The tree that represents the different cluster solutions is shown in table 9.

< insert table 9 here >

For all subgroups, except for the group from 50 to 500 employees, the cluster analyses result in a two-cluster solution. The following dichotomy is consistent over all the subgroups. The first cluster is composed of companies with a high short- and long-term planning formality, a rather prospective strategy and a low PEU. Further these companies are characterized by a strong engagement in control, variable rewards and networking practices; and they have highly educated CEOs. The second cluster has the opposite characteristics. These firms have less short- and long-term planning formality, a rather defensive strategy and a high PEU. They are less involved in control, variable reward and networking practices and have less educated CEOs. However, it is important to stress that for the subgroup of companies with 5 to 10 employees (FTE) the PEU and the use of variable reward systems is not significantly different between the two clusters. The latter finding is probably due to the fact that small companies do not use variable reward systems, and that the environment in which these companies operate is very local. For the subgroups of companies with 5 to 10 employees and companies with 25 to 50 employees

the clusters differ with respect to growth rate too. In these subgroups, the firms in the first cluster achieve higher growth rates than the firms in the second cluster. For the other subgroup, namely the companies with 10 to 25 employees, there is no difference concerning growth rate between the two clusters. With respect to profitability, there is never a difference between the clusters.

Besides these two-cluster solutions, we also found a four-cluster solution for the subgroup of companies with 25 to 50 employees. This solution is in fact a further split-up of the second cluster. The first cluster of the two-cluster solution, composed of planners with a rather prospective strategy and a low PEU, remains. The firms in this cluster, which we name cluster A, are further characterized by high growth rates and profitability, a large size, highly educated CEOs and a strong involvement in networking activities and control and variable reward systems. The second cluster of the two-cluster solution, namely the non-planners with a rather defensive strategy and a high PEU, is split up into three different clusters in the four-cluster solution, which we name clusters B, C and D. Cluster B is characterized by firms with a low short- and long-term planning formality, with a high PEU and a rather defensive strategy. The companies in this cluster are weakly engaged in networking activities and control and variable reward systems, they are small and are guided by less educated CEOs. Further, they achieve quite low growth rates, but a high gross ROA. Cluster C consists of large companies that demonstrate a rather low short- and long-term planning formality, a low PEU and a defensive or even reactive strategy. They are weakly involved in financial controls, but quite strongly in operational controls. Further, they make little use of variable reward systems. These firms have quite highly educated CEOs and achieve high profitability. Cluster D is composed of large firms with high short-term, but quite low long-term planning formality, quite a high PEU and a rather analyzing strategy. They achieve low growth and profitability, are weakly involved in financial controls, but quite strongly in operational controls and networking; moreover they are guided by highly educated CEOs. Cluster D could point at firms in distress that as a result use more short-term planning.

Cluster analysis for the subgroup of companies with 50 to 500 employees revealed three clusters. The first cluster is composed of 57 companies with high short- and long-term planning formality, a low PEU and a rather prospective strategy. Further, the firms in this cluster are strongly involved in variable reward practices and operational controls. The 12 companies in the second cluster do not plan formally, nor in the short run, nor in the long run. They demonstrate a high PEU and a rather defensive strategy. Furthermore, they use less non-financial performance indicators. The last cluster consists of 25 firms that plan formally in the short run and quite formally in the long run. These companies have a low PEU and a defensive or even reactive strategy. They are weakly engaged in variable reward systems and operational control systems. The three clusters do not differ with respect to growth, profitability, CEO education, networking activities nor firm size.

- *Conclusion*

In this paper the results of contingency research with contingent variables MAS systems, PEU, strategy, involvement in networks and CEO education are presented. As prior empirical research presented in the literature gave rise to conflicting results, we did not put forward a priori causal relationships between the different variables. Instead we have adopted a systems approach (the so-called level 4 contingency research – see Chenhall and Fisher (1995)) combined with the construction of tree structures based on industry and dimension differences. Systems of fit were detected in this research with the use of cluster analysis. Each data set (= whole sample, the manufacturing industry, the trade industry and the subgroups of firms with the following dimensions (5-10, 10-25, 25-50)

could be characterized by a two-cluster solution. Only cluster analysis of the subgroup of large companies resulted in a three-cluster solution. The two-cluster solutions had mainly the same characteristics, except that PEU did not play a role in very small firms and that formal short-term planning did not play a significant role in the manufacturing industry. In the case of the two-cluster solutions, we mostly find the same fits for both the whole sample and all the industry and firm dimension subgroups. In each (sub)group the first cluster of companies is characterized by the following pattern of fit: high short- and long-term planning formality, a rather prospective strategy and a low PEU. Further these companies are characterized by a strong engagement in control, variable rewards and networking practices; and they have highly educated CEOs. The second cluster demonstrates the opposite pattern of fit, namely a low short- and long-term planning formality, a rather defensive strategy and a high PEU. Other characteristics of this cluster are a weak engagement in control, variable reward and networking practices; and less educated CEOs. Moreover, in the whole sample, in both the industry subgroups and in some of the firm dimension subgroups, the first cluster is characterized by high growth rates, whereas the second by low growth rates. The two systems of fit, however, do not differ with respect to performance in terms of profitability. Profitability differences between the clusters only emerged at the level of the four-cluster solutions. The following patterns of fit result from the four-cluster solutions: first, a prospective strategy seems to indeed result in higher growth rates than a defensive strategy. Second, the perception of environmental uncertainty appears to be inversely associated with profitability. This implies that a high perceived environmental uncertainty occurs together with low profitability and vice versa. Small firms, however, appear to be better able to deal with this uncertainty as a high PEU will occur together with higher levels of profitability. In large firms, however, a high PEU usually goes together with low profitability. There are a few clusters of firms that do not satisfy this pattern, namely clusters C and D of the four-cluster solution for the subgroup of manufacturing. Finally, we would like to draw the attention to cluster D of the 4-cluster solution for the firms with 25 to 50 FTEs. This cluster demonstrates a high ST planning formality, a rather defensive strategy and a high PEU. This system of fit is characterized by weak profitability. This finding could point at companies in distress where planning is necessary to keep them in existence. This also refers to the fact that the relationship between planning and performance is bi-directional and that firm performance can be a contingent variable in relation to planning. Not only does planning have an influence on performance, weak performance can also lead to formal planning in an attempt to solve the problems.

Table 7: Tree for the whole sample – cluster analyses without growth and profitability among the cluster variables

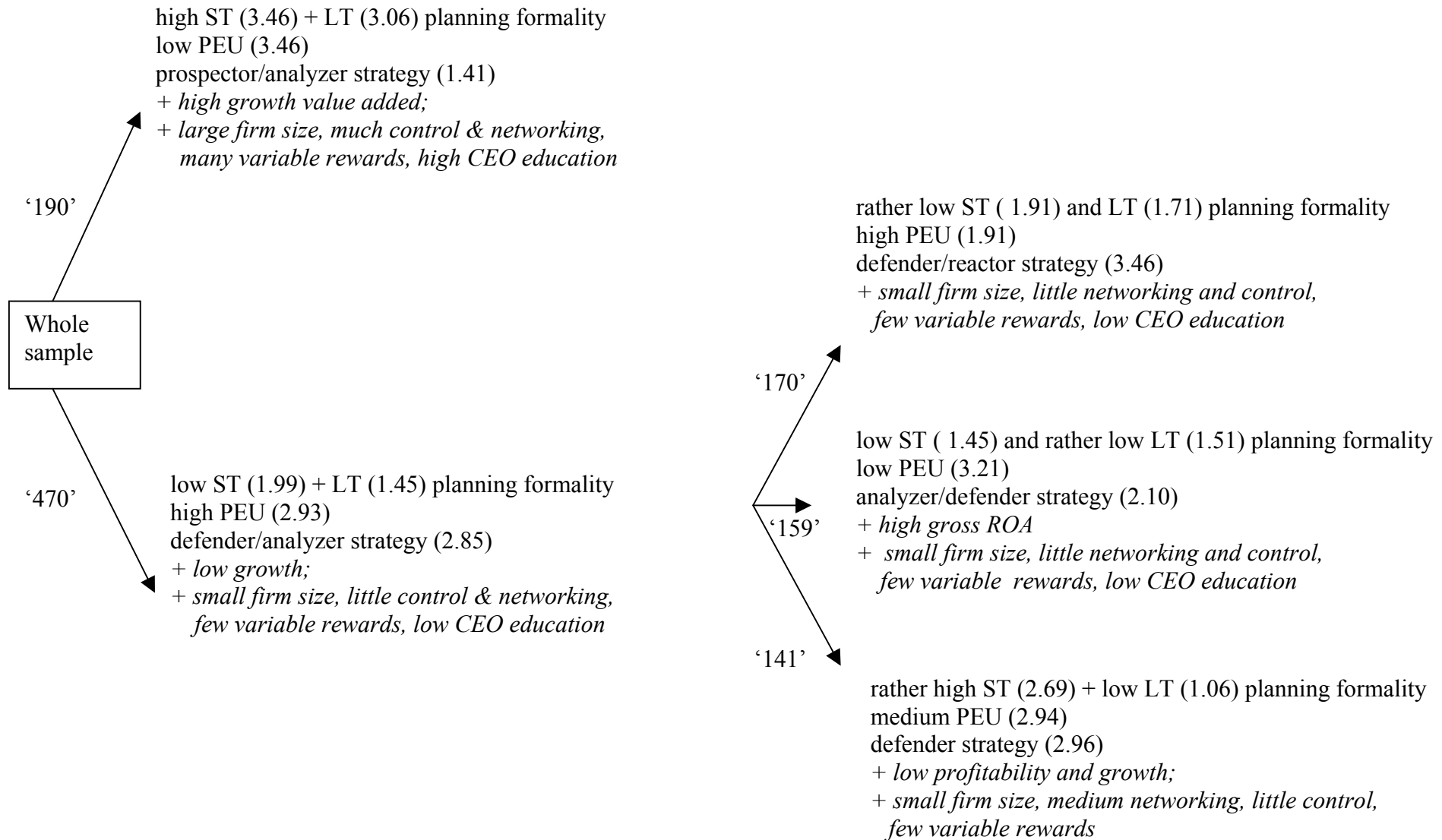
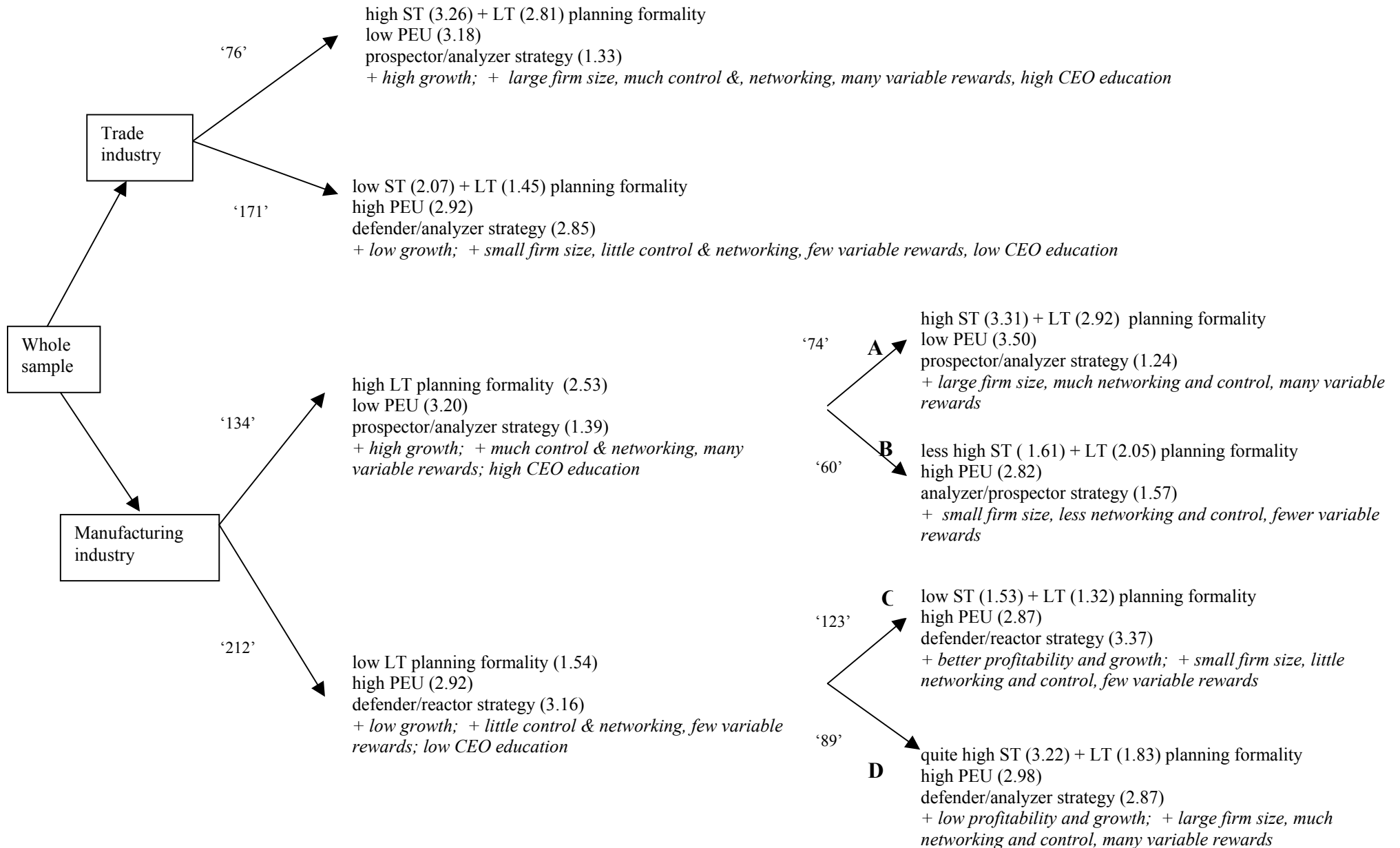
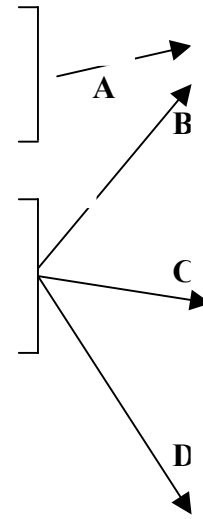
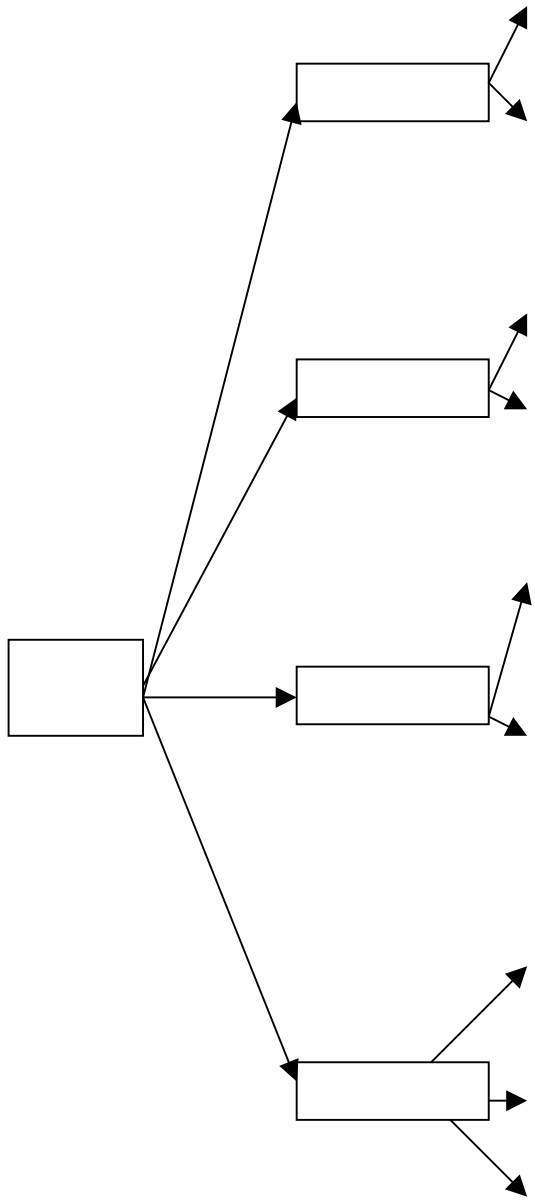


Table 8: Tree for industry – cluster analyses without growth and profitability among the cluster variables





APPENDIX: Operationalizations of Measures

Firm strategy is determined using the classic typology of business strategy developed by Miles and Snow (1978). Firms were asked to identify their overall strategy regarding their most important product/service line by choosing one of the following descriptions: We are innovators and are willing to take the necessary risks of providing new products and services (prospector: code 1). We do not want to be the first in our industry to offer an unproven product or service, but we try to be close behind with a similar product or service that is competitive (analyzer: code 2). We stick to what we know how to do and do it as well as or better than anyone else (defender: code 3). We do not follow a specific program or plan for making us more competitive, although, when we are faced with strong threats or opportunities, we definitely make changes (reactor: code 4).

We distinguished three **industries** in which firms can operate: manufacturing, trade and services. The manufacturing industry consists of firms with NACE codes ranging from 0 to 5. The trade industry is identified by the NACE codes 6 and 7 and the NACE codes 8 and 9 represent the service industry.

Four levels of **CEO education** are formulated: lower/secondary education (code 1), higher education of the short type (code 2), higher education of the long type (code 3) and university education (code 4).

Use of formal internal control systems is assessed with a set of binary variables that capture each whether or not a particular financial or operational performance indicator is used in the organization. The 21 financial performance indicators include measures of profitability, solvency, liquidity and value added. The 19 operational performance indicators refer to market research, product/service development, distribution, sales and production. Two aggregated variables are created: 'number of financial performance indicators used' (range: 0→21) and 'number of operational performance indicators used' (range: 0→19).

Use of variable reward systems is measured using four binary variables. These variables indicate whether or not the firm pays variable rewards to management or other personnel based on profit or other performance. We created the aggregated variable 'types of variable reward systems used', measured as the sum of the positive answers (yes) to these four questions. This variable ranges thus from 0 (no variable rewards paid) to 4 (four types of variable rewards paid).

Networking activities of the CEO are captured by several questions. First the frequency of contacts with the following parties was demanded: local, national and international entrepreneurs, lawyers, auditors, external accountants, consultants and competitors. Five levels of frequency were possible: never (code 1), yearly (code 2), half-yearly (code 3), monthly (code 4) and weekly (code 5). From this information we derived the variable 'frequency of contacts' (range 1 → 5). This variable is computed as the mean of the answers on this question. Further respondents had to tick the activities in which the CEO or other directors are frequently engaged: specialized fairs, seminars, congresses, initiatives of service clubs, Chamber of Commerce, industrial federations and employer's organizations. This information resulted in the variable 'number of activities participated in' (range 0→7), which is computed as the sum of activities in which the CEO or other director's participate.

BIBLIOGRAPHY

- Andrews, K.R. (1971), *The concept of corporate strategy*, Dow Jones-Irwin, Homewood, IL.
- Ansoff, H.I. (1979), *Strategic Management*, Wiley, New York.
- Barney, J.B. (1986), "Types of competition and the theory of strategy: toward an integrative framework", *Academy of Management Review*, Vol. 11, pp. 91-8.
- Beal, R.M. (2000), "Competing effectively: environmental scanning, competitive strategy and organizational performance in small manufacturing firms", *Journal of Small Business Management*, Vol. , pp.27-47.
- Beal, R.M. and M. Yasai-Ardekam (2000), "Performance implications of aligning CEO functional experiences with competitive strategies", *Journal of Management*, Vol. 26, n° 4, pp. 733-762.
- Birley, S. (1985), "The role of networks in entrepreneurial process", *Journal of Business Venturing*, Vol. 1, n° 1, p. 107-117.
- Bracker, J. S., B. W. Keats en J. N. Pearson (1988), "Planning and financial performance among small firms in a growth industry", *Strategic Management Journal*, Vol. 9, pp. 591-603.
- Brownell, P. (1985), "Budgetary systems and the control of functionally differentiated organizational activities", *Journal of Accounting Research*, Vol. 23, pp. 502-512.
- Burns, T. and G.M. Stalker (1961), *The management of innovation*, London: Tavistock.
- Carsrud, A.; C. Gaglio and K. Olm (1987), "Entrepreneurs – mentors, networks and successful new venture development: an exploratory study", *American Journal of Small Business*, Vol. 12, n° 2, pp. 13-28.
- Chaganti, R., R. Chaganti and V. Mahajan (1989), "Profitable small business strategies under different types of competition", *Entrepreneurship Theory and Practice*, Vol. 13, pp. 21-35.
- Chaganti, R en J. A. Schneer (1994), "A study of the impact of owner's mode of entry on venture performance", *Journal of Business Venturing*, Vol 9, n° 3, pp. 243-260.
- Cragg, P. B. en M. King (1988), "Organisational characteristics and small firms' performance revisited", *Entrepreneurship Theory and Practice*, Vol. 12, n° 2, pp. 49-64.
- Chenhall, R.H. (2001), "Management control systems design within its organizational context: findings from contingency-based research and directions for the future", paper presented at the EDEN doctoral seminar on management accounting and control research (Brussels).
- Chenhall, R.H. and D. Morris (1995), "Organic decision and communication processes and management accounting systems in entrepreneurial and conservative business organisations, Omega", *International Journal of Management Science*, Vol. 23, n° 5, pp. 485-497.
- Chenhall, R.H. and K. Langfield-Smith (1998), "The relationship between strategic priorities, management techniques and management accounting: an empirical investigation using a systems approach", *Accounting, Organizations and Society*, Vol. 23, n° 3, pp. 243-264.
- Child, J. (1974), "Managerial and organizational factors associated with company performance – Part I", *Journal of Management Studies*, Vol. 11, pp. 173-189.
- Covin, J.G. (1991), "Entrepreneurial versus conservative firms: a comparison of strategies and performance", *Journal of Management Studies*, Vol. 28, n° 5, pp. 439-462.
- Daft, R.; J. Sormunem and D. Parks (1988), "Chief executive scanning, environmental characteristics and company performance: an empirical study", *Strategic Management Journal*, Vol. 9, pp. 123-139.
- Daft, R. and K. Weick (1984), "Toward a model of organizations as interpretation systems", *Academy of Management Review*, Vol. 9,; pp. 284-295.
- Datta, Y. (1980), "New directions for research in business strategy", *Journal of General Management*, Vol. 6, pp. 48-60.
- Dent, J.F. (1990), "Strategy, organisation and control: some possibilities for accounting research", *Accounting, Organizations and Society*, Vol. 15, pp. 3-25
- Dill, W.R. (1958), "Environment as an influence on managerial autonomy", *Administrative Science Quarterly*, Vol. 2, pp. 409-443.
- Everitt, B., *Cluster analysis*, 3th ed, 1993, London, Heineman
- Ezzamel, M. (1990), "The impact of environmental uncertainty, managerial autonomy and size on budget characteristics", *Management Accounting Research*, Vol. 1, pp. 181-197.
- Fisher, J. (1995), "Contingency-based research on management control systems: categorization by level of complexity", *Journal of Accounting Literature*, Vol. 14, pp. 24-53.
- Fredrickson, J. W. en T. R. Mitchell (1984), "Strategic decision processes: comprehensiveness and performance in an industry with an unstable environment", *Academy of Management Journal*, Vol. 27, n° 2, pp. 399-423.
- Freel, M.S. (2000), "Strategy and structure in innovative manufacturing SMEs: the case of an English

- region”, *Small Business Economics*, Vol. 15, pp. 27-45.
- Gadenne, D. (1998), “Critical Success Factors for Small Business: an inter-industry comparison “, *International Small Business Journal*, Vol. 17, n° 1, pp. 36-51.
- Ginsberg, A. and N. Venkatraman (1985), “Contingency perspectives of organizational strategy: a critical review of the empirical research”, *Academy of Management Review*, Vol. 10, pp. 421-434.
- Gul, F. A. (1991), “The effects of management accounting systems and environmental uncertainty on small business managers’ performance “, *Accounting and Business Research*, Vol. 22, n° 85, pp. 57-61.
- Hage, J. and M. Aiken (1970), *Social Change in complex organizations*, Random House, New York.
- Hambrick, D.C. (1982), “Environmental scanning and organizational strategy”, *Strategic Management Journal*, Vol. 3, pp. 159-174.
- Hamilton, R.T. and Shergill, G.S. (1992), “The relationship between strategy-structure fit and financial performance in New Zealand: evidence of generality and validity with enhanced controls”, *Journal of Management Studies*, Vol. 29, n° 1, pp. 95-113.
- Imoisili, O.A. (1985), “Task complexity, budget style of evaluating performance and managerial stress: an empirical investigation. Unpublished dissertation, Graduate School of Business, University of Pittsburg.
- Ittner, C.D. and Larcker, D.L. (2000). “Assessing empirical research in management accounting: a value-based management perspective”, forthcoming in *Journal of Accounting and Economics*
- Jarillo, J. (1989), “Entrepreneurship and growth: the strategic use of external resources”, *Journal of Business Venturing*, Vol. 4, pp. 133-147.
- Johannisson, B. (1996), “The dynamics of entrepreneurial networks”, *Frontiers of entrepreneurship research*, eds. P. Reynolds, S. Birley, J. Butler, W. Bygrave, P. Davidson, W. Gartner & P. McDougal, pp. 253-267. Wellesley, MA: Babson College.
- Kefalas, A. and P. Schoderbeck (1973), “Scanning the business environment”, *Decision Sciences*, Vol. 4, pp. 63-74.
- Khandwalla, P.N. (1976), “The techno economic ecology of corporate strategy”, *Journal of Management Studies*, Vol. 13, pp. 62-75.
- Kim, L. (1980), “Organizational innovation and structure”, *Journal of Business Research*, Vol. 8, n° 2, pp. 225-245.
- Kim, L. and Y. Lim (1988), Environment, generic strategies and performance in a rapidly developing country: a taxonomic approach, *Academy of Management Journal*, Vol. 31, pp. 802-827.
- Lang, J.R., R.J Calatone and D. Gudmundson (1997), “Small firm information seeking as a response to environmental threats and opportunities”, *Journal of Small Business Management*, Vol. 35, pp. 11-23.
- Lawrence, P.R. and D. Dyer (1983), *Renewing American Industry*, Free Press, New York.
- Lindsay and Rue (1980), “Impact of the business environment on the long range planning process: a contingency view”, *Academy of Management Journal*, Vol. 23, pp. 385-404.
- Luo, Y. (1999), “Environment-strategy-performance relations in small businesses in China: a case of township and village enterprises in southern China”, *Journal of Small Business Management*, pp.37-52.
- Lyles, M. A., I. S. Baird, J. B. Orris en D. F. Kuratko (1993), “Formalised planning in small business: increasing strategic choices “, *Journal of Small Business Management*, Vol. 31, n° 2, pp. 38-50.
- Marlin, D., J.J. Hoffman and B.T. Lamont (1994), “Porter’s generic strategies, dynamic environments and performance: a profile deviation fit perspective”, *The International Journal of Organizational Analysis*, Vo. 2, n° 2, pp. 155-175.
- Masurel, E. en H. P. Smit (2000), “Planning behaviour of small firms in Central Vietnam “, *Journal of Small Business Management*, Vol. 38, n° 2, pp. 95-102.
- Matthews, C. H. en S. G. Scott (1995), “Uncertainty and planning in small and entrepreneurial firms “, *Journal of Small Business Management*, Vol. 33, n° 4, pp. 34-65.
- Miles, R.E. and C.C. Snow (1978), *Organizational strategy, structure and process*, McGraw-Hill, NY.
- Miller, C.C. and L.B. Cardinal (1994), “Strategic planning and firm performance: a synthesis of more than two decades of research”, *Academy of Management Journal*, Vol. 37, n° 6, pp. 1649-1665.
- Miller, D. (1988), “Relating Porter’s business strategies to environment and structure: analysis and performance implications”, *Academy of Management Journal*, Vol. 31, pp. 280-308.
- Miller, D. (1986), “Configurations of strategy and structure: towards a synthesis” *Strategic Management Journal*, Vol. 7, pp. 233-249.
- Miller, D and P.H. Friesen (1983), “Strategy-making and environment: the third link”, *Strategic Management Journal*, Vol. 4, pp. 221-235.

- Mintzberg, H. (1979), *The structuring of organizations*, Prentice Hall, Englewood Cliffs, NJ.
- Mitchell, F.; R. Gavin and J. Smith (1998), "A case for researching management accounting in SMEs", *Management Accounting for Chartered Management Accountants*, Vol. 76, n° 9, pp. 30-36.
- Neilsen, A. (1992), "A new metaphor for strategic fit: all that jazz", *Leadership and Organization Development Journal*, Vol. 13, n° 5, pp. 3-6.
- Ostgaard, A. and S. Birley (1994), "Personal networks and firm competitive strategy: a strategic or coincidental match?", *Journal of Business Venturing*, Vol. 89, n° 4, pp. 281-305.
- Otley, D.T. (1978), "Budget use and managerial performance", *Journal of Accounting Research*, Vol. 16, n° 1, pp. 122-149.
- Paine, F.T. and Anderson, C.R. (1977), "Contingencies affecting strategy formulation and effectiveness: an empirical study", *Journal of Management Studies*, Vol. 41, pp. 147-158.
- Parnell, J.A.; D.L. Lester and M.L. Menefee (2000), "Strategy as a response to organizational uncertainty: an alternative perspective on the strategy-performance relationship", *Management Decision*, Vol. 38, n° 8, pp. 520-531.
- Rhyne, L. (1985), "The relation of information usage characteristics to planning system sophistication: an empirical examination", *Strategic Management Journal*, Vol. 6, pp. 319-337.
- Risseuw, P. en E. Masurel (1994), "The role of planning in small firms: empirical evidence from a service industry", *Small Business Economics*, Vol. 6, n° 4, pp. 313-332.
- Robinson, R. B., Jr. (1982), "The importance of "outsiders" in small firm strategic planning", *Academy of Management Journal*, Vol. 25, n° 1, pp. 80-93.
- Robinson, R. B., Jr. and Pearce, J. A., II (1983), "The impact of formalized strategic planning on financial performance in small organizations", *Strategic Management Journal*, Vol. 4, pp. 197-207.
- Sawyer, O. (1993), "Environmental uncertainty and environmental scanning activities of Nigerian manufacturing executives: a comparative analysis", *Strategic Management Journal*, Vol. 14, n° 4, pp. 287-299.
- Sawyer, O. (1999) and J. E. McGee (1999), "The impact of personal network characteristics on perceived environmental uncertainty: an examination of owners/managers of new high technology firms", *Babson College paper*.
- Schendel, D. and C. Hofer (1979), *Strategic Management: a new view of business policy and planning*, Little, Brown, Boston, MA.
- Schrader, C. B., C. L. Mulford en V. L. Blackburn (1989), "Strategic and operational planning, uncertainty, and performance in small firms", *Journal of Small Business Management*, Vol. 27, pp. 45-60.
- Schwenk, C. en C. B. Shrader (1993), "Effects of formal strategic planning on financial performance in small firms: a meta-analysis", *Entrepreneurship Theory and Practice*, Vol. 17, n° 3, pp. 53-64.
- Simons, R. (1987), "Accounting control systems and business strategy: an empirical analysis", *Organizations and Society*, Vol. 12, pp. 357-374.
- Sutcliffe, K.M. and G.P. Huber (1998), "Firm and industry as determinants of executive perceptions of the environment", *Strategic Management Journal*, Vol. 19, pp. 793-807.
- Snow, C.C. and D.C. Hambrick (1980), "Measuring organizational strategies: some theoretical and methodological problems", *Academy of Management Review*, Vol. 5, pp. 527-538.
- Tan, J. (1996), "Characteristics of regulatory environment and impact on entrepreneurial strategic orientations: an empirical study of Chinese private entrepreneurs", *Academy of Management Best Paper Proceedings*, pp. 106-110.
- Tung, R.S. (1979), Dimensions of organizational environments: an exploratory study of their impact on organization structure, *Academy of Management Journal*, Vol. 22, pp. 672-693.
- Tyler, B.B., K.L. Bettenhausen and R.L. Daft (1989), "The use of low and high rich information sources and communication channels in developing and implementing competitive business strategy", paper presented at the annual meeting of the Academy of Management.
- Van de Ven, A. and R. Drazin (1985), "The concept of fit in contingency theory". In Cummings, L.L. & B.M. Staw (Eds.), *Research in Organizational Behavior*, Vol. 7, pp. 333-365. New York: JAI Press.
- Van de Ven, A.; R. Hudson and D. Schroeder (1984), "Designing new business start-ups: entrepreneurial, organizational and ecological considerations", *Journal of management*, Vol. 10, pp. 87-107.
- Venkatraman, N. (1989), "The concept of fit in strategy research: toward verbal and statistical correspondence", *Academy of Management Review*, Vol. 14, pp. 423-444.
- Venkatraman, N. and J.E. Prescott (1990), "Environment-strategy co alignment: an empirical test of its performance implications", *Strategic Management Journal*, Vol. 11, pp. 1-23.