Journal of Management and Governance
https://doi.org/10.1007/s10997-018-9431-y

Strategic choices and strategic management accounting in large manufacturing firms

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Abstract
This study examines the relationship between strategic choices and the use of strategic management accounting (SMA) techniques in large manufacturing companies and investigates whether external factors such as environmental uncertainty and competitive forces affect the SMA system. The survey results show that SMA usage does not depend on strategy type and only marginally depends on geographic orientation. These findings have been integrated using qualitative data collected in seven large companies through interviews. Although significant progress has been made over the last two decades in describing SMA practices in Europe, the contribution of this study to the accounting (SMA) literature involves both the research content and design. Having identified gaps in previous SMA research, we design a study focused on large manufacturing firms that considers different hypotheses and adopts a mixed method approach.

Keywords Mixed method approach · Strategy types · Geographic orientation · Strategic management accounting · Survey and interviews

1 Introduction

This study examines the relationship between strategic choices and the use of strategic management accounting (SMA) techniques in large manufacturing companies and investigates whether external factors such as environmental uncertainty and competitive forces affect the SMA system. It provides field-based evidence by employing a mixed-method approach that combines survey and exploratory interviews of a subset of respondents in corporate financial and accounting departments.

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Published online: 07 August 2018

To respond to the challenges of global competition, companies express strategic purposes and identify their strategy. The complexity of business strategy presents challenges for managers tasked with evaluating strategic activities, which is crucial to defining competitive scope and competitive advantage.

Many scholars argue that conventional (or traditional) management accounting (MA) does not provide enough information to support strategic decisions (Lord 2007). Whereas strategic processes consider plans and the possible actions of competitors, management accounting supports strategic decisions by providing managers with internal financial and non-financial information and with financial and non-financial information on the environment and on a firm's competitors. As suggested by Johnson et al. (2014: 445), "Structure is a key ingredient of organising for success. But structures can only work if they are supported by formal and informal organizational systems". SMA, as a type of organizational system, provides information that aids strategic decision-making processes. The focus of a strategic perspective on management accounting (SMA) is to align accounting and strategy.

In contrast with traditional MA, SMA techniques embody an outward-looking and forward-looking orientation. They tend to comprise multiple periods and are proactive in all stages of strategic decisions (see Wilson 1995).

The motivation for the present research is to provide a broad assessment of the current usage of SMA techniques to support strategic choices, such as strategy type and geographic orientation, through a survey. Through qualitative interviews, the study also aims to interpret corporate accountants' perception of strategic costing and competitor accounting as primary SMA technique categories to support strategic choices in seven large companies.

The study has four main objectives:

1. to test the relationship between strategy types and SMA technique usage;
2. to test the relationship between geographic orientation and SMA technique usage;
3. to investigate whether external factors, such as environmental uncertainty and competitive forces, affect the SMA system;
4. to assess corporate accountants' perception of strategic costing and competitor accounting supporting strategy choices.

The paper comprises six sections. The next section briefly reviews the strategy literature and the major SMA approaches, with a focus on strategy types and geographic orientation. In section three, two hypotheses are developed to postulate the relationships between the usage of SMA techniques (dependent variables) and a set of influencing factors (independent variables). Section four describes the research method (sampling procedures, variable measurement and data analysis). Section five presents the survey and interview results. The paper concludes with a discussion about the results and the limitations of the study and offers potential avenues for future research.

2 Literature review

The term SMA was first introduced in the literature 35 years ago by Simmonds (1981), who promoted SMA as a tool to align accounting with strategy. More recently, a rigorous concept of SMA has been proposed (e.g., Bromwich 1990; Cadez and Guilding 2008), and several accounting scholars have provided considerable theoretical contributions to the literature on this topic (Langfield-Smith 2008). The literature also presents criticism. As suggested by Carlsson-Wall et al. (2015: 27), it is not surprising that "SMA practices included indirect benefits, something mainly neglected in the existing literature on SMA". In addition, "SMA research has also overlooked the importance of strategy in the public sector and the specificities of this context that problematise existing knowledge of techniques that might make up SMA" (Cuganesan et al. 2012: 245).

The literature on SMA can be divided into two major strands.

First, a rich body of literature presents several possible theoretical models such as those of Simmonds (1981) for the US and Bromwich (1990) for the UK. Simmonds, who coined the term SMA to provide a strategic perspective on management accounting, noted that profits arise from how efficiently a firm operates internally, from strategic advantages over its competitors and, consequently, from a firm's competitive position over time. Bromwich (1990: 28) developed a working definition of SMA: "The provision and analysis of financial information on the firm's product markets and competitors' costs and cost structures and the monitoring of the enterprise's strategies and those of its competitors in these markets over a number of periods". Bromwich and Bhimani (1994: 127) argue that "Providing a strategic perspective in management accounting requires the role of accounting to be extended in two directions. It first requires that costs be integrated into strategy using a variety of strategic cost analyses. The aim is to align costs with strategy. The second element of strategic management accounting is to discover in a fairly general way the cost structure of competitors and to monitor changes in these over time".

In the US, Shank and Govindarajan (1992, 1993) are proponents of strategic cost analysis. Their approach serves as a new accounting tool that relies on the work of strategist scholars, Porter (1985) in particular. Their innovative proposal is of considerable practical significance, as it connects accountants with strategy and can contribute to business strategy formulation. The most important finding presented by Shank and Govindarajan, who primarily use the case study method, may be that traditional cost accounting methods cannot be expected to significantly aid managers in strategic areas.

A second relevant strand of research has generated insight through surveys of practice using different statistical analyses. Field-based research has focused on cross-country comparisons of SMA usage (see, Guilding et al. (2000) in New Zealand, the UK and the US, and Cadez and Guilding (2007) in Slovenia and Australia) and several surveys on practices focused on individual countries (e.g., Cadez and Guilding (2012) in Slovenia, Cinquini and Tenucci (2010) in Italy, Noordin et al. (2009) in Malaysia, and Guilding and McManus (2002) in Australia).

However, few international studies have employed a survey and interviews as a mixed methods approach to empirically assess relevant questions on SMA practices (e.g., Cadez and Guilding 2008; Bhimani and Langfield-Smith 2007).

2.1 Strategy type and geographic orientation

Different concepts of strategy and strategic management have been proposed by scholars (e.g., Chandler 1962; Ansoff 1965; Hofer and Schendel 1978; Andrews 1980; Mintzberg 1987; Whittington 1993). Mintzberg et al. (1998) identify ten schools of thought using two approaches to business-level strategy (outside-in and inside-out). As suggested by Invernizzi (2005), the outside-in approach primarily includes the following: configurational (Chandler 1962), design (Andrews 1980) and positioning schools (Porter 1980). The inside-out approach essentially comprises planning (Ansoff 1965), entrepreneurial (Normann 1977), cognitive and learning (Quinn 1978) and cultural, political and environmental schools (Peters and Waterman 1982).

As noted by Langfield-Smith (1997), the typologies of strategies presented by Miles and Snow (1978), Gupta and Govindarajan (1984) and Porter (1980, 1985) have attracted considerable attention in SMA research. Porter's distinctions between cost, differentiation and focus, which define a set of generic strategies, have been criticized by several researchers (e.g., Mintzberg 1987). However, we use Porter's strategy types as a strategic choice because they potentially affect SMA usage and facilitate the aims of the present study. In addition, we include geographic orientation as a strategic choice that affects SMA usage. These two main constructs, strategy type and geographic orientation, are used to identify strategic choices. Whereas Porter's strategy types involve deciding how to compete in a market, geographic orientation focuses on the selection of products, markets and industries to pursue. Geographic orientation was gauged using an adapted version of Ansoff's matrix (1988) focusing on the market development strategy based on new geographies. Identification of geographic orientation provides a useful starting point for determining strategic choices concerning new markets or businesses.

In summary, we use "strategy type" and "geographic orientation", as independent variables, because they explain strategy choices in terms of (a) how companies relate to competitors in terms of their competitive business strategies using Porter's distinction between cost leadership, differentiation and focus strategies; and (b) how far companies should extend themselves internationally or nationally using Ansoff's product market growth matrix as a strategy framework for generating four directions for organizational growth, including market development in terms of new geographies.

2.2 External factors relevant for strategy

In the present study, we also consider two external factors relevant to strategy: (1) environmental uncertainty and (2) competitive forces.

The environment plays a primary role in creating market opportunities and presenting threats. It is important that strategic management analyses its environment. The strategy literature provides frameworks for analysing changing environments, which are organized in three main layers: macro-environment, industry, and competitors and markets. Within the macro-environment, the analysis consists of identifying how environmental uncertainty may affect organizations and the given firm. Here, the environmental uncertainty factor is particularly useful in understanding the role of inflation rates, exchange rates, the global economic growth rate, and business cycles and how a firm's markets are affected by these variables. In addition, from the growth or decline of sales, the level of prices, the vulnerability in export markets and whether to import can be determined.

In the accounting literature, the concept of perceived environmental uncertainty (PEU) has received attention because it affects the strategic choices of the firm (Wheelen and Hunger 1995). Identifying key drivers for change helps strategic managers to focus on the environmental uncertainty factors that must be addressed. Regarding the importance and the strategic nature of PEU, Tymon, Stout and Shaw (1998: 26) note that "The critical aspects of the PEU construct are: (1) it refers to the external environment of an organization; (2) it refers to perceptions of that environment; (3) a degree of uncertainty results from the perceptions; and (4) the relevant perceptions are those of top managers. Thus, firm strategies are impacted by PEU".

Within the general environment framework, industry is a high-level layer. An industry is a group of companies whose production and sales of products are essentially the same. Industry analysis typically begins with Porter's five forces framework and techniques for examining the dynamics of the industry, such as industry life cycle. Porter's five forces framework is useful for understanding the attractiveness of an industry considering the threat of entry, threat of substitutes, power of buyer, power of suppliers, and extent of rivalry between competitors. These five forces identify the industry's structure and the attractiveness offers potential profit for the firms. When the degree of industry attractiveness has been understood, the five forces can help the strategic managers make decisions. Moreover, strategic decisions that allow for effective action can be important for understanding how the attractiveness is affected by the firm's strategic cost drivers and for comparing the firm's cost structure with that of its key competitors. Porter notes that some of these drivers are not under a firm's control, as they are related to the structure of the industry involved and that other cost drivers can be influenced by internal firm actions. The principal key strategic drivers that influence the cost behaviours of value-added activities identified by Porter (1985: 70–83) are economies (diseconomies) of scale, linkages, learning and spillovers, patterns of capacity utilization (which affect unit costs), integration (between units in an organization), interrelationships (within a business), timing, discretionary policies (independent of others), location (of a business), and institutional factors (impinging on a firm). The identification of key strategic drivers helps to determine value chains and analysis or measurement of a firm's value chain, and its competitors' value chains can help the firm to move towards a strategy type.

2.3 SMA techniques

Lord (2007: 137) suggests that "There are several problems with trying to use traditional management accounting for strategic management […] (and) several authors have discussed what should be used instead", noting that there are at least four perspectives on the components of SMA. The first emphasizes information on competitors, the second emphasizes information on the strategic positions assumed by a firm, the third employs a value chain perspective, and the fourth focuses on products and market information.

The present study considers the four views on the relationship between business strategy and SMA presented by Lord (2007), the characteristics of SMA proposed by Wilson (1995) and the features of information proposed by Brouthers and Roozen (1999). The key SMA techniques identified in this study are inspired by the above literature and are a reinterpretation of Guilding et al. (2000), Cravens and Guilding (2001), Reeve and Warwick (2006), Cadez and Guilding (2008), and Cinquini and Tenucci (2010). In this study, the four SMA technique categories selected are (1) strategic costing, (2) strategic decision-making, (3) competitor accounting, and (4) strategic performance measurement. As indicated in Table 1, the SMA technique categories include twelve SMA techniques.

Each of these four SMA technique categories is briefly examined.

- Strategic costing

Bromwich and Bhimani (1994: 126) suggest that SMA "helps to focus managerial efforts more on their markets, where customers have to be won and retained and competitors repulsed, and on the costs of these markets activities […] to ascertain the enterprise's cost positioning relative to its rivals". This suggestion highlights the necessity of recognizing that, from a strategic perspective, a firm must

Table 1 Strategic management accounting (SMA): categories and techniques

SMA technique categories	SMA techniques
Strategic costing	Attribute costing
	Target costing
	Life cycle costing
	Quality costing
	Value chain costing
Strategic decision-making	Strategic pricing
	Brand valuation
Competitor accounting	Competitor position monitoring
	Competitor cost assessment
	Competitor appraisal based on published financial statements
Strategic performance measurement	Balanced scorecard
	Risk analysis/management

integrate costs into strategies through a variety of strategic cost analyses. Shank and Govindarajan (1988) are chief proponents of strategic cost analysis, and their work is primarily based on Porter's strategic competition model. Their view is that SMA stresses the need to collect (through formal and structured methods) cost data that allow for comparisons between a firm and its competitors. The costs in strategic cost analysis indicate the importance of separate considerations applied to these SMA techniques: value chain costing (Dekker 2003; Hergert and Morris 1989; Shank and Govindarajan 1992), attribute costing (Bromwich 1990; Roslender and Hart 2003), life-cycle costing (Atkinson et al. 1997; Dunk 2004), target costing (Hasegawa 1986; Monden and Hamada 1991), and quality costing (Mackey and Thomas 1995).

- Strategic decision-making

Strategic decision-making is an SMA technique category that plays a relevant role in supporting strategic choices. It has significant consequences for a company's performance over time. Here, we consider two main SMA techniques: strategic pricing and brand valuation.

Strategic pricing involves pricing decisions using competitively oriented analysis based on the considerations of marketing executives. This level of market competition includes an appraisal of the following factors: "competitor price reaction; price elasticity; projected market growth; and economies of scale and experience" (Guilding et al. 2000: 120). When companies tend to compete by emphasizing highly perceived quality and branded products and services, the variable brand valuation provides a potential measure of marketing achievements. This SMA technique "involves combining projected brand earnings (an accounting-orientated measure) with a multiple derived from the brand's strength on strategic factors such as the nature of the brand's market, its position in that market and its level of marketing support" (Guilding et al. 2000: 118). Brand valuation essentially provides trends over time regarding market reputation and the potential implications for marketing executives and strategic accounting. For example, superior reputation with customers provides a marketing advantage that influences superior performance measures.

- Competitor accounting

Bhimani and Langfield-Smith (2007: 6) suggest that "The prescriptive strategy literature considers strategy as a formalised statement of intent or plan which identifies objectives and intended actions". Porter's framework views strategy as a company's competitive position in its competitive environment and involves developing tools for analysing and determining a firm's positioning in a competitive market. The aim is to select alternative strategies that help a firm yield a sustainable competitive advantage over their rivals by selecting optimal strategies based on competitive forces and a firm's comparative advantage. This presupposes the participation of corporate strategic accountants in strategic processes of recording, analysing and presenting formal competitors' accounting (financial and non-financial) information. This philosophy, which considers the participation of corporate strategic accountants in strategic processes, is widely discussed in the SMA literature. In this approach,

SMA involves collecting competitor accounting information to facilitate comparisons among firms and their competitors. Strategic competitor analyses, which primarily provide outward-looking information, emphasize the importance of applying separate considerations to the following SMA techniques: competitor cost assessment (Simmonds 1981; Ward 1992), competitor position monitoring (Wilson 1995), and competitor appraisals based on published financial statements (Coad 1996).

- Strategic performance measurement

Strategic performance measurement is the fourth SMA technique category, which involves consideration of Balanced Scorecard (BSC) and Risk Analysis (see, for example, Chenhall 2005; Cadez and Guilding 2008). Application of a strategic perspective in management accounting requires that the role of accounting be extended in at least two directions. The first direction requires that a company collect formal and structured performance measures. Here, we distinguish between economic measures (e.g., market growth, market share, sales growth and profitability) and effectiveness measures (e.g., the number of set-ups, cycle efficiency, defects, capacity utilization, lead-time and hours worked). As an SMA technique, the BSC is an important measure of economic and effectiveness performance (Kaplan and Norton 1992; Davila 2012). In 2001, Kaplan and Norton noted that the BSC had transformed from performance measurement to strategic management (Kaplan and Norton 2001: 87). The second direction requires performance comparisons using two basic approaches: (i) comparisons against strategic objectives (targets) and trends over time and (ii) comparisons against other comparable competitors. Performance comparison against strategic targets denotes meeting expectations regarding organizational performance (economic and effectiveness) and the comparison of trends over time is important to understand whether performance measures are declining or improving.

When companies consider comparisons with comparable competitors' performance as a benchmark (Brownlie 1999), a broad range of financial and non-financial accounting information can be used. Here, it is relevant to understand the risk. In the context of strategic performance measurement, corporate accountants must support strategic management by evaluating the acceptability of the risk and return level of the strategy and whether it meets stakeholders' expectations (see, for example, CoSO 2004; Johnson et al. 2014).

3 Development of Hypotheses

In this section, the hypotheses are developed to postulate relationships between several dependent variables (the SMA techniques) and the independent variables. We consider the following independent variables: (1) strategy types; (2) geographical orientation, and (3) external factors relevant for strategy.

- H1: Hypothesis relating strategy types and SMA techniques usage

Cadez and Guilding (2012: 486) note that "Strategy typologies constitute profiles of different strategic postures that emphasize integrative components of different strategies". Here, the literature suggests that cost leadership strategy involves the lowest-cost organization in a domain of activity compared with the costs incurred by competitors (see Johnson et al. 2014). The fundamental cost drivers that aid in implementing a cost leadership strategy are input costs, economies of scale, product/process design and efficiency (experience curve). Organizations can choose to interact with customers exclusively through low cost rather than along different strategic dimensions, but they should not neglect quality. This consideration leads to the following hypothesis:

H1a: Cost leadership companies use more strategic costing than differentiation and focused companies.

In selecting a cost leadership strategy and translating its cost advantage into profit, companies are supposed to adopt an SMA technique category based on strategic costing with internal and external financial and non-financial information. The principal alternative to cost leadership is differentiation. Differentiation, which can vary between markets, involves providing products/services that are perceived by customers as unique and allow for a price premium by offering high levels of quality, customer service and brand reputation. In selecting a differentiation strategy, a strategic management team must identify and monitor two main factors, strategic customers and key competitors. Chenhall and Langfield-Smith (1998: 246) suggest that: "Balanced performance measures link measures of customer satisfaction, such as timely and reliable delivery, with other measures of key production activities, such as cycle time and throughput rates, while demonstrating the implications for financial outcomes". Furthermore, when sources of advantage include product designs and product and service attributes, a relevant point of differentiation is the ability to identify factors that influence firm cost structures, assess performance and identify any gap between desired and projected performance. This can be expressed as:

H1b: Companies pursuing differentiation strategies make greater use of competitor accounting and strategic decision-making than cost leadership and focused companies.

Porter (1985: 15) suggests that the focus strategy "is quite different from the others because it rests on the choice of a narrow competitive scope within an industry […] By optimizing its strategy for the target segment, the focuser seeks to achieve a competitive advantage in its target segment even though it does not possess a competitive advantage overall". While cost focus firms seek a cost advantage in their target segment, differentiation focus firms seek differentiation in their target segment. A necessary condition of these two focus strategy variants is the segment structural attractiveness. Usually, most industries have several segments that involve, for example, different production or delivery systems and creating candidates for a focus strategy. A crucial strategic question for a firm has become where to compete and in what segment to focus strategies. However, the

focus strategy can be identified as a combination of cost leadership and differentiation strategies, and the implication is that management practices follow a holistic approach (see Porter 1980). This then influences a combination of management accounting practices. More generally, Chenhall and Langfield-Smith (1998: 258) suggest that "strategic planning techniques are important in ensuring a holistic approach under which different approaches to management and accounting are coordinated and consistent with the long-term goals of the organization". These considerations lead to the following hypothesis:

> H1c: Companies pursuing focus strategies rely more on a holistic approach to SMA techniques than companies following cost leadership and differentiation strategies.

- H2: Hypothesis relating geographic orientation and SMA technique usage

Every organization faces different product/market opportunities, which are the strategic directions available to companies. While the business strategy is a matter of deciding how to compete in a market, the choice of strategic directions focuses on which products and markets (and industries) to pursue. The theoretical studies often use Ansoff's product/market growth matrix (1988) to define the following strategic directions: (a) market penetration, (b) product development, (c) market development, and (d) conglomerate diversification. Each strategic option provides potential benefits, constraints, and risks. Focusing mainly on market development, strategies tend to fail when they are simply based on delivering traditional products/services in new markets. Therefore, the essential constraint is offering products/services that are particularly valued by strategic customers and provide a competitive advantage. Internationalization is an example of a market development strategy. International competition, particularly in worldwide areas, is a challenge because strategic managers, with the support of strategic accountants, must carefully appraise potential sources of international competitive advantage. Despite the potential benefits of increasing a company's share with international worldwide markets (areas), this can be an expensive and high-risk activity for at least three reasons: (a) the capital investment in market research, product design, and new processes/technologies that are unfamiliar to the organization; (b) increased costs due to the project investment complexity; (c) creation of strategic risk (particularly operating and competitive risk). The market development strategy through internationalization requires the collection of more market-oriented information (Lord 2007). This can be expressed as:

> H2a: Companies oriented internationally make greater use of competitor accounting and strategic performance measurement.

In selecting an international strategy and translating their competitive advantage into profit, companies are supposed to make greater use of SMA technique categories based on competitor accounting and strategic performance measurement, often collected in reports issued by strategy consulting services. This

strategy, which mainly involves international companies (e.g., FCA, Toyota, Nestlè) operating in global geographical areas, requires knowledge of the internationalization drivers. Using Greiner's classic model (1998), the international strategy seems appropriate for high growth, often through differentiation, in a company's mature stage.

In contrast, many large companies have developed strategic business units aimed at internal investments. In these domestic firms, internal investments can be interpreted as a safeguard against innovations and niches that attract powerful competitors in growing internal markets. Given the difficulty that some large companies have in developing innovation, strategic management has often concluded that the best approach is to occupy a niche that seems appropriate for new growth in the national existing market – often through cost leadership. Johnson et al. (2014: 315) states that "in more established markets, where large firms are already present, entrepreneurial firms are more successful if they can find niches that are still not occupied. These niches are often better supplied by low-cost adaptation of existing products rather than by radical innovation". These considerations lead to the following hypothesis:

> H2b: Companies oriented nationally make greater use of strategic costing and strategic decision-making than companies oriented internationally.

Marketing managers and academics tend to distinguish between internal, internal and international, and international strategies for defining a set of generic geographic orientations.

Of course, most companies do not develop a strategic orientation through the classic three stages of growth in the life of the organization. However, each of these geographic orientations raises key challenges for the strategic management of large companies.

Focusing on internal and international strategy, "many manufacturing firms expanded internationally by exporting the product manufactured at home to foreign subsidiaries to sell […]. In time, however, it might prove viable to manufacture the product in each country, and so production facilities would be added on a country-by-country basis" (Hill 2009: 456). Here, the company is organized in product divisions. Therefore, one challenge involves designing a new organizational structure that can reduce conflict and increase coordination between national (domestic) and foreign operations. While operations authority and strategic decisions are typically decentralized to each geographic area, the corporate headquarters retains responsibility/authority for the entire strategic development and management control of the companies. In the transition from the internal to internal and international strategy, as a combination of business strategies for a new stage of growth, the implication is to bring professional managers and the presence of advanced managerial and accounting and finance skills. Here, a key challenge in supporting different geographical areas of competition is the use of all SMA techniques, the relative emphasis of which varies with strategy through a holistic approach. These considerations lead to the following hypothesis:

H2c: Companies oriented nationally and internationally rely more on a holistic approach to SMA techniques.

- H3: Hypothesis on external factors relevant for strategy that may affect the SMA system

Cadez and Guilding (2008: 854) note that "strategy is the most important factor affecting SMA usage". An important antecedent of this strong empirical evidence suggests that external factors affect the business strategy, and they interact with the major elements of the organizational architecture, including the accounting system, and ultimately the value of the firm (Zimmerman 2017). The external factors are important to analyse the environment to anticipate the environmental change. Here, the strategy literature emphasizes the importance of external factors such as environmental uncertainty and Porter's five forces framework. While uncertainty can be considered a factor that has an impact on almost all the organizations, the five forces framework "addresses the importance of industry factors rather than business-specific factors" (see Johnson et al. 2014: 34).

Previous studies have examined the relationship between strategy and perceived environmental uncertainty (PEU) without considering the role of accounting (e.g., Govindarajan 1988). Gul and Chia (1994) provide evidence that perceived environmental uncertainty (PEU) affects management accounting systems (MAS). Chong and Chong (1997) indicate the presence of direct effects between strategy and perceived environmental uncertainty; strategy and management accounting information; and perceived environmental uncertainty and management accounting information. While this last empirical study provides evidence on the relationship between environmental uncertainty and management accounting, limited evidence can be found on the five forces and management accounting relationship.

However, the theoretical development provides arguments for a potential effect of the five forces on accounting and control system, which can be explained in part by an effect in the use of SMA. This can be formally expressed as:

H3: SMA usage is positively associated with external factors such as environmental uncertainty and competitive forces.

4 Research Method

This section describes the method used, sampling procedures, variable measurement and data analysis.

4.1 Mixed methods

A mixed methods approach was used to develop additional insight into the usage of SMA techniques. The quantitative design involves the first and second research objectives, and the related hypotheses are tested using the survey. Furthermore, the

questionnaire asked participants to rank and analyse the relevance of two external factors (environmental uncertainty and competitive forces) that may affect the SMA system. The quantitative analysis, with appropriate statistical tools, tests the hypotheses and provides the survey results on SMA usage. The qualitative analysis, based on collection and interpretation of interviews, assesses the fourth research objective on SMA usage based on corporate accountants' perceptions of strategic costing and competitor accounting supporting strategic choices.

4.2 Sampling procedures

As noted above, the data used in this research were collected using two approaches, a web questionnaire (survey) and interviews, because "the combination of qualitative and quantitative approaches provides a more complete understanding of a research problem than either approach alone (Creswell 2014: 4)". The target population included large Italian manufacturing companies (with annual revenues exceeding €100 million). Addresses and company statistics were obtained from the Italian Industry, Commerce, and Agriculture Confederation (CCIAA) database. The database contains contact details, industry classifications, and financial figures. The CCIAA database typically does not provide the names of CEOs or employees in corporate financial and accounting responsibility (the respondents in our survey), so they were contacted by sending a letter by e-mail to a selected set of companies. The letter explained the objectives of the research, asked whether there was an interest in participating in the project and requested the respondents' names and e-mail addresses. The respondents were asked to indicate whether they would be interested in participating in the initial pilot test.

The pilot test involved eight corporate chief financial officers (CFOs) and CEOs working in four different industries. As a result, several survey questions were revised before the final questionnaire was distributed.

The questionnaire comprised open-ended and scaled questions.

A sample of 223 randomly selected large manufacturing companies was contacted. Seventy-four companies agreed to respond to the research questionnaire and were sent an e-mail that included a glossary of SMA techniques and a link to the web questionnaire. Fifty-five complete and usable questionnaires were returned, indicating a response rate of 24.7%.

The industry classification of the sampled companies is presented in Table 2.

The sampled companies presented the following characteristics. 28 companies are listed on the stock exchange. With respect to the geographical orientation, 14 companies are competing in international markets, 8 are competing in the internal markets, and 33 are considered to be competing in both markets. With respect to the strategy types, the sample presents 17 differentiation-oriented companies, 31 focused companies and 7 cost leadership companies.

In terms of turnover, most large manufacturing companies in the sample (54.6%) have a sales level $\geq$ €1,000 million. In total, 21.8% have a sales level ranging from €999 to €401 million, and 23.6% of the companies' annual sales level ranges from €400 to €100 million.

Table 2 Industry classification of the sampled companies

Industry	Number of companies	Percentage of sample
Automotive	2	3.7
Car systems and component design	3	5.5
Mechanical and electronic equipment	15	27.2
Electrical appliances	2	3.7
Food	3	5.5
Telecommunications	8	14.5
Energy distribution	5	9.0
Chemical and pharmaceutical	3	5.5
Furniture	3	5.5
Caterpillar and farm machinery	4	7.2
Steel	3	5.5
Others	4	7.2
Total	55	100.0

To investigate possible non-response bias, a Chi Square test was conducted to detect differences in the industrial sector distribution between the companies that completed the questionnaire and those that did not respond. No significant differences were found (p value = 0.63), suggesting the absence of biases.

The quantitative data collected with the questionnaire were integrated with interview data.

The seven large companies involved in the interviews were drawn from a wide range of industrial sectors (and environments). In addition, the companies differ in terms of strategy types and geographic orientation. Among the questionnaire respondents, interviews were conducted with senior corporate CFOs, controllers and investment analysts who volunteered.

Information on the large manufacturing companies involved in the interviews is summarized in Table 3.

Table 3 Information on large companies involved in the interviews

Companies	Nature of company	Turnover range (million euros)	Interviewee
A	Automotive: luxury cars, sports cars, economy cars, SUVs and delivery vans	≥ 1000	Group CFO
B	Machine manufacturing for getter technologies	100–400	Group CFO
C	Ceramic machine and equipment manufacturing	≥ 1000	Group Controller
D	Farm tractor manufacturing and component distribution	≥ 1000	Group CFO
E	Energy distribution and utilities management water	≥ 1000	Group Controller
F	Electrical appliances: refrigerators, laundry appliances, kitchen appliances and professional appliances	≥ 1000	Group Controller
G	Components and systems for car manufacturing	≥ 1000	Investment analyst

4.3 Variable measurement

4.3.1 SMA technique usage

To measure the use of SMA techniques, we decided to adopt a dichotomous scale. The survey asked respondents "Does your organization use the following Strategic Management Accounting (SMA) techniques"? The 12 SMA techniques were listed with a dichotomy scale: 0 (not used) and 1 (used). A glossary containing the definition, description and leading proponents of each SMA technique was integrated into the survey to aid interpretation. The glossary of SMA techniques was drawn from previous studies (Guilding et al. 2000; Cinquini and Tenucci 2010).

This choice aims to avoid the subjectivity of a more detailed Likert scale. Although the level of use could represent interesting information, the measure of this construct can be very poor if a simple single-item scale is used to capture this latent dimension. Therefore, we decided to focus on simple and more reliable information collected with the dichotomous scale. While the information about the simple use of the technique is collected in a very understandable and objective way, in a Likert-response item the distances between the different scale levels (e.g., strongly disagree, disagree, neutral, agree and strongly agree) are only theoretically equal. Moreover, respondents are not always able to distinguish between many levels of use.

The analysis of the use of SMA techniques is also developed considering the definition of the holistic approach as given, for example, by Chenhall and Langfield-Smith (1998: 258). We assume that companies adopting a large number of SMA techniques are able to obtain a valuable advantage due to synergy between them. For this reason, we consider the total number of SMA techniques adopted by each company to measure the holistic approach to SMA usage. In particular, the holistic nature of SMA use is measured by a count variable ranging from 0 to 12.

4.3.2 SMA techniques importance

The importance of SMA techniques is measured asking "In your opinion (perception), how relevant are the following SMA techniques for your firm?" The perceived level of importance of each SMA technique is measured with a seven-point scale ranging from 1 (not important at all) to 7 (crucial). For each technique, the perceived level of importance represents interesting information for ranking and comparing our results with the main previous studies on SMA usage. In particular, we adopt the level of importance, based on the perceptions of senior corporate accountants, as an approximate measure of the level of SMA usage. Finally, the perceptions of senior corporate accountants are considered a proxy for the intensity of SMA techniques usage in the main previous studies and facilitate international comparison with descriptive statistics. The assumption (the linkage between usage and perception) we consider to define this proxy measure

is supported by empirical evidence in our dataset. For example, the companies using the SMA techniques always present a larger level of perceived importance.

4.3.3 Strategy types

The business strategy types were drawn from Porter (1980). The measure developed by Shortell and Zajac (1990) was used. This instrument was adapted considering the following types of business strategies: cost leadership, differentiation, and focus. A glossary containing the definition and description of each competitive strategy was integrated into the survey to aid interpretation. This measurement instrument allowed for the independent variable (business strategy) for three groups of companies to be operationalized: differentiation companies (those adopting differentiation strategies), cost leadership companies (those adopting cost leadership strategies) and focus companies (those adopting focus strategies).

4.3.4 Geographic orientation

Strategic directions focus on which products, markets and industries to pursue. Within the main strategic directions, market development (Ansoff 1988) is important for organizational growth and takes two basic forms: new users and new geographies. Internationalization is an example of market development based on new geographies. Because this dimension of strategy, to our knowledge, has not been operationalized in previous research, an original measurement instrument was developed. To assess the extent of an organization's business strategy direction, the survey asked respondents to choose one of the following geographically oriented strategies: (1) mainly international markets, (2) internal markets or (3) internal and international markets.

4.3.5 External factors relevant for strategy

As indicated in Sect. 2.2, we consider two external factors relevant to strategy, such as environmental uncertainty and competitive forces, which may affect the SMA system.

Intrinsic in strategic processes, environmental uncertainty was measured using the same instruments applied by Gordon and Narayanan (1984). Using a seven-point scale ranging from 1 (not at all) to 7 (to a large degree), respondents were asked the following question: "How dynamic/uncertain is the external environment facing your firm?"

The same type of scaling technique was used to measure the relevance of the five forces (Porter's framework): the threat of entry, threat of substitutes, power of buyers, power of suppliers, and rivalry between competitors. The respondents were asked "How relevant are the following sources of environmental pressure (competitive forces) for your firm? Please consider the seven-point scale ranging from 1 (not important at all) to 7 (crucial)."

4.4 Data Analysis

To study the hypothesized relationships, we adopted an inferential approach.

The relationship between strategy types and the use of SMA techniques, considering Pearson's Chi squared Test (as defined in Agresti 2007), is studied to test hypotheses H1a and H1b. The results of the testing procedure allow for the significance of the relationship between strategies types and the use of the SMA techniques to be evaluated. The association can then be studied in-depth by comparing the estimated proportions of use conditional to the type of business strategy. The p values of Chi Squared tests have been computed considering a simulation approach. The Monte Carlo test (Hope 1968) with 10,000 replicates is used to face the issues related to low frequencies in the contingency tables.

The Kruskal–Wallis non-parametric testing procedure was considered to check the hypothesis H1c. The test can be used to study differences (between the three types of companies) in the total number of used techniques.

The same procedures are considered to study the relationship between the geographic orientation and the use of SMA techniques for testing the hypotheses H2a, H2b and H2c.

To test H3, we adopt a model-based approach. The model-based approach is necessary to account for quantitative variables in the estimation of the probabilities of SMA usage. A simple logit model is used to study the effect of the two external factors on the SMA techniques usage. The logit model considers the linear specification

$$\eta_i = \beta_0 + X_i\beta \tag{1}$$

where η_i is the logit transformation of the firm's probability of adopting the SMA technique, X_i is the matrix of the explicative variables, and the coefficient vector β represents the effect of the variables on the expected probability. Given the model specification, the coefficients can also be interpreted as Odds-Ratios. The results of the model estimation are considered to identify and evaluate the significance of the effect of the external factors.

All the considered analyses were developed in R (R Core Team 2017) using the chisq.test, Kruskal.test and glm core functions for the tests and the generalized linear model estimation, respectively.

5 Results

5.1 Questionnaire

The paper provides survey results that contribute to a better understanding of SMA practices using hypothesis testing and descriptive statistics.

The survey results describe the SMA techniques importance based on the perceptions of the senior corporate accountants. Table 4 summarizes the descriptive statistics of the 12 SMA techniques and indicates that the mean scores of the techniques importance range from 5.72 (strategic costing) to 4.03 (attribute costing). All 12 SMA techniques present mean importance scores above the midpoint of the

Table 4 Descriptive statistics of SMA techniques importance

Variables	Rank	Mean	SD	Range
Strategic pricing	1	5.72	1.35	1–7
Competitor position monitoring	2	5.56	1.63	1–7
Balanced Scorecard	3	5.34	1.55	1–7
Risk analysis	4	5.27	1.19	1–7
Value chain costing	5	5.03	1.47	1–7
Target costing	6	4.92	1.46	1–7
Brand valuation	7	4.74	1.65	1–7
Competitor appraisal based on financial statement	8	4.63	1.47	1–7
Quality costing	9	4.60	1.55	1–7
Competitor cost assessment	10	4.54	1.41	1–7
Life-cycle costing	11	4.29	1.84	1–7
Attribute costing	12	4.03	1.72	1–7

measurement scale (1–7). Here, higher importance scores are registered for strategic pricing, competitor position monitoring, balanced scorecard, risk analysis (management), and value chain costing. While lower importance scores are registered for attribute costing and life-cycle costing, target costing and quality costing are strategic costing techniques that play a relevant role in decision-making. While competitor position monitoring plays a strong role in strategic decisions, the other two competitors' accounting techniques are less important. Again, Table 4 reveals a high level of importance of balanced scorecard and risk analysis (management).

For each technique, the perceived level of importance represents interesting information for ranking and comparing our results with the main previous studies on SMA usage. In particular, we adopt the level of importance based on the perceptions of senior corporate accountants as an approximated measure of the level of SMA usage.

Consequently, we developed the following international comparison (Table 5).

First, in our results the high orientation towards the usage of competitor position monitoring is consistent with the study of Guilding et al. (2000) in the UK, the US, and NZ, Cravens and Guilding (2001) in the US, Cadez and Guilding (2007) in Slovenia and Australia, and Cinquini and Tenucci (2010) in Italy. Furthermore, a balanced scorecard appears to be largely used as in the US (Cravens and Guilding 2001) and in Slovenia (Cadez and Guilding 2007). In contrast, a balanced scorecard registers lower usage scores, particularly in Australia and Italy (Cinquini and Tenucci 2010). Again, the international comparison shows a common orientation towards target costing and quality costing, especially in NZ, the US (Guilding et al. 2000), Slovenia (Cadez and Guilding 2007) and Italy (Cinquini and Tenucci 2010).

5.1.1 Findings relating strategy types and SMA technique usage (hypotheses testing)

Hypothesis H1, relating strategy types and SMA technique usage, states that (a) cost leadership companies use more strategic costing than differentiation and focused

Table 5 International comparison of SMA techniques usage. *Source*: Adapted from Cinquini and Tenucci (2010)

Study	Guilding et al. (2000)			Cravens and Guilding(2001)	Cadez and Guilding (2007)		Cinquini and Tenucci (2010)	This study
Country	UK	USA	NZ	USA	SLO	AUS	ITA	ITA
Respondents	63	127	124	120	134	27	92	55
Scale used	1–7	1–7	1–7	1–7	1–7	1–7	1–7	1–7
SMA techniques	Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean
Strategic pricing								5.72
Competitor position monitoring	5.20	4.93	4.95	4.93	4.31	4.40	4.69	5.56
Balanced Scorecard				4.00	3.94	2.83	3.17	5.34
Risk analysis								5.27
Value chain costing	2.60	3.15	3.15	3.15	3.90	2.63	3.43	5.03
Target costing	2.90	3.19	3.16	3.19	3.64	2.00	3.62	4.92
Brand valuation								4.74
Competitor appraisal based on financial statement	4.78	4.50	4.17	4.50	4.47	4.04	4.44	4.63
Quality costing	3.11	3.07	3.46	3.07	4.31	1.67	4.12	4.60
Competitor cost assessment	4.37	4.09	3.91	4.09	3.38	3.96	3.95	4.54
Life-cycle costing	2.60	2.73	2.43	2.73	2.90	2.21	2.92	4.29
Attribute costing								4.03

companies; (b) companies pursuing differentiation strategies make greater use of competitor accounting and strategic decision-making than cost leadership and focused companies; and (c) companies pursuing focus strategies rely more on a holistic approach to SMA techniques than companies following cost leadership and differentiation strategies. Consistent with Table 1, the four SMA technique categories are (1) strategic costing; (2) strategic decision-making; (3) competitor accounting; and (4) strategic performance measurement. The three strategy types, as generic competitive strategies, are (1) differentiation, (2) cost leadership, and (3) focus.

Association Chi Square tests were conducted. The results of the tests are presented in Table 6.

The percentage of SMA technique usage was variable across the three strategy types chosen by the companies. A significant association was observed between the use of brand valuation and strategy types (p value = 0.09).

Hypothesis 1a (H1a) is not supported because there are no significant associations between the specific SMA techniques (strategic costing) and the strategy types (cost leadership).

Hypothesis 1b (H1b) is partially supported. In fact, the association between the use of the brand valuation, as part of the strategic decision-making SMA technique category, and the strategy types can be considered significant at 10%. In particular,

Table 6 A comparison of SMA techniques used by the companies on the three strategy types: Results of Chi Square test analysis

SMA techniques	Strategy types**			χ^2 statistic	*p* value
	Differentiation companies	Focus companies	Cost leadership companies		
Strategic costing					
Attribute costing	35.3*	22.6	28.6	0.90	0.76
Life-cycle costing	23.5	22.6	42.9	1.29	0.61
Quality costing	23.5	38.7	28.6	1.21	0.60
Target costing	35.3	54.8	57.1	1.89	0.38
Value chain costing	29.4	35.5	42.9	0.42	0.86
Strategic decision-making					
Strategic pricing	64.7	58.1	42.9	0.97	0.64
Brand valuation	64.7	32.3	42.9	4.70	**0.09**
Competitor accounting					
Competitor position monitoring	88.2	83.9	57.1	3.42	0.19
Competitor cost assessment	35.3	29.0	71.4	4.45	0.12
Competitor appraisal based on published financial statements	58.8	45.2	57.1	0.94	0.69
Strategic performance measurement					
Balanced scorecard	76.5	64.5	57.1	1.09	0.66
Risk analysis/management	64.7	58.1	71.4	0.52	0.79

*For example, 6 companies out of 17 use the attribute costing

**The numbers are expressed in percentage

brand valuation presents high usage rates in the differentiation of companies. Here, our quantitative data findings are consistent with Cravens and Guilding (1999) only for such SMA techniques.

The result of the Kruskal–Wallis test shows that hypothesis 1c (H1c) is not supported, as the *p* value is 0.378. Therefore, focus companies do not rely on a holistic approach to SMA techniques more than cost leadership and differentiation companies. In general, focus companies present the lower average for the number of used SMA. In fact, the group-specific averages of the number of used SMA are 7.00 (s.d. = 2.55), 6.29 (s.d. = 2.10) and 7.29 (s.d. = 3.20) for the differentiation, focus and cost leadership companies, respectively.

5.1.2 Findings relating geographic orientation and SMA technique usage (hypotheses testing)

Hypothesis H2 state that (a) Companies oriented internationally make greater use of competitor accounting and strategic performance measurement; (b)

Companies oriented nationally make greater use of strategic costing and strategic decision-making than companies oriented internationally; and (c) Companies oriented nationally and internationally rely more on a holistic approach to SMA techniques.

The three geographic orientations were labelled: (1) international (mainly international markets), (2) national (internal markets), and (3) national and international (internal and international markets).

Chi Square tests were conducted, and the results are presented in Table 7. The numbers reported in the table are not simple proportions of observations. The percentages identify the proportions of users of the various SMA techniques in the three groups of companies (these are conditional percentages in which each proportion varies in the closed set of values [0, 1] without constraints on the sum).

The percentage of SMA technique usage was variable across the companies classified according to the three geographic orientations.

Table 7 A comparison of SMA techniques used by the companies on the three geographic orientations: Results of Chi Square test analysis

SMA techniques	Geographic orientation**			χ^2 statistic	p value
	Mainly international markets	Internal markets	Internal and international markets		
Strategic costing					
Attribute costing	35.7*	37.5	21.2	1.54	0.52
Life-cycle costing	28.6	12.5	27.3	0.84	0.76
Quality costing	57.1	0.0	30.3	7.77	**0.02**
Target costing	57.1	25.0	51.5	2.30	0.35
Value chain costing	35.7	25.0	36.4	0.38	0.85
Strategic decision-making					
Strategic pricing	71.4	62.5	51.5	1.67	0.51
Brand valuation	14.3	50.0	54.6	6.63	**0.04**
Competitor accounting					
Competitor position monitoring	78.6	87.5	81.8	0.27	1.00
Competitor cost assessment	57.1	25.0	30.3	3.58	0.19
Competitor appraisal based on published financial statements	57.1	25.0	54.6	2.54	0.31
Strategic performance measurement					
Balanced scorecard	64.3	50.0	72.7	1.59	0.51
Risk analysis (management)	71.4	75.0	54.6	1.88	0.44

*For example, 5 companies out of 14 use the attribute costing

**The numbers are expressed in percentage

Table 7 shows that hypothesis 2a (H2a) is not supported by the data. Indeed, differences in the competitor accounting and strategic performance measurement usage are not significant.

Two significant associations are observed for quality costing (p value = 0.02) and for brand valuation (p value = 0.04), one opposed and one in favour of the hypothesis (H2b), respectively. These results support at least partially H2b.

While statistical tests indicate that brand valuation is an important SMA technique to support a combination of national and international strategy orientation, quality costing is an SMA technique associated with an international (market) geographic orientation. This means, in our interpretation, that quality costing is used more by firms competing in international markets because large manufacturing companies consider the product and service quality to be an international competition lever. As Nixon and Burns (2012: 239) observe, there is a "pressure on organizations to reduce costs, while simultaneously meeting the product-service quality and functionality that customers demand".

Regarding hypothesis 2c (H2c), involving the companies oriented nationally and internationally, the result of the Kruskal–Wallis test shows that the hypothesis is not supported, as the p value is 0.438. Therefore, companies oriented nationally and internationally do not rely more on a holistic approach to SMA techniques. Here, the group-specific averages of the number of used SMA for the three groups of companies, based on geographic orientation, are 7.36 (s.d. = 2.68), 5.88 (s.d. = 1.36) and 6.52 (s.d. = 2.43) for the units competing in international, internal and internal and international markets, respectively.

5.1.3 Findings on external factors relevant to a strategy that may affect the SMA system (hypotheses testing)

In the present study, in addition to the quantitative analyses on strategy types and geographic orientation, the survey asked participants to rank the importance of two external factors relevant for strategy (environmental uncertainty and competitive forces). To check for the validity of H3, we considered a model-based analysis identifying the effects of the external factors as coefficients of the regression model and evaluating their significance.

Using a seven-point scale ranging from 1 (not at all) to 7 (to a large degree), the descriptive statistics of the environmental uncertainty show that the mean and standard deviation were 4.67 and 1.36, respectively. The relationship between the level of environmental uncertainty and SMA technique usage was studied using logit model estimation. This statistical method is more appropriate because the degree of environmental uncertainty is measured on a quantitative scale. The regression result shows a positive relationship between the uncertainty and the use of strategic pricing as part of the strategic decision-making SMA technique category. The coefficient of uncertainty in strategic pricing regression was significantly positive (coefficient 0.57; p value = 0.02), and a higher uncertainty corresponds to a higher probability of using the strategic pricing SMA technique.

Regarding the relevance of the five forces, the results of simple logit regressions show that (1) the threat of entry positively affects the probability of using strategic pricing, balanced scorecard and risk management (p values are 0.03, 0.04 and 0.10, respectively); (2) the threat of substitutes has a positive and significant effect on the probability of using life cycle costing (p value = 0.04) and a balanced scorecard (p value = 0.01); (3) buyer power had no significant effect on the use of SMA techniques; (4) supplier power positively affects the use of strategic pricing (p value = 0.042); and (5) competitive rivalry positively affects the use of target costing, balanced scorecard and risk management SMA techniques (p values are 0.10, 0.01 and 0.10, respectively).

5.1.4 Summary of results of hypotheses testing

A summary of the results of hypotheses testing is reported in Table 8.

The evidence provided here suggests that SMA usage basically does not depend on strategy type. While H1a and H1c are rejected, H1b is marginally supported. Furthermore, the results of hypotheses testing show that SMA usage only marginally depends on geographical orientation (H2b). Again, there is a positive association between external factors, such as environmental uncertainty and competitive forces, and SMA usage. The survey results are further discussed in Sect. 6.

Table 8 Summary of the results of hypotheses testing

Hypotheses	Test	Test results
H1a: Cost leadership companies use more strategic costing than differentiation and focused companies	Pearson's Chi squared	Not supported
H1b: Companies pursuing differentiation strategies make greater use of competitor accounting and strategic decision-making than cost leadership and focused companies	Pearson's Chi squared	Supported for brand valuation
H1c: Companies pursuing focus strategies rely more on a holistic approach to SMA techniques than companies following cost leadership and differentiation strategies	Kruskal–Wallis	Not supported
H2a: Companies oriented internationally make greater use of competitor accounting and strategic performance measurement	Pearson's Chi squared	Not supported
H2b: Companies oriented nationally make greater use of strategic costing and strategic decision-making than companies oriented internationally	Pearson's Chi squared	Supported for brand valuation
H2c: Companies oriented nationally and internationally rely more on a holistic approach to SMA techniques	Kruskal–Wallis	Not supported
H3: SMA usage is positively associated with external factors such as environmental uncertainty and competitive forces	Logit model	Supported for strategic pricing, balanced scorecard, risk analysis, target costing, life-cycle costing

5.2 Interviews

Interviews were undertaken with corporate administrative departments, such as CFOs, controllers, and investment analysts, and include three critical semi-structured questions using an e-mail interview document. In the first step, the interviewees were asked to describe the strategic profile of the company in terms of business strategy type and geographic orientation. In the second step, they were asked to express their perceived importance of the adoption of strategic costing and competitor accounting as SMA technique categories and the related critical SMA techniques. In the third step, interviewees were asked to express their opinion on the structure and formality of SMA information, focusing on strategic costing and competitor accounting in strategic development and implementation.

The most widely cited strategy type was cost strategy. The four cost strategies were associated with geographic orientation strategies (one referred to international markets, and three referred to internal and international markets).

The second widely cited strategy type was the differentiation strategy. The three differentiation strategies were associated with geographic orientation (two referred to international markets, and one referred to internal and international markets). Notably, cost strategy firms tend towards participation in internal and international markets, and differentiation strategy firms tend towards participation in international markets. In our interpretation, the interviews express the view that the macro-environment, including the industry-specific characteristics, is a relevant factor that influences strategic choices and SMA application.

As a second interview step, interviewees were asked to comment on the perceived importance of SMA techniques in strategy choices, with a focus on strategic costing and competitor accounting.

In contrast with H1b, Table 6 documents a non-significant association between a differentiation strategy and SMA usage based on competitor accounting.

The interviews that referred to firms that compete with differentiation strategies partially disagree with this view. The opinions of the interviewees can be interpreted as highly rational because the firms need competitor accounting information, such as competitor position monitoring, cost assessment, and appraisal based on the published financial statement, to support differentiation strategy in firms applying formal and structured approaches to strategic development and implementation.

For example, Interviewee E—from a company in the energy distribution industry that competes with a differentiation focus strategy—commented as follows:

> Given the characteristics of the businesses in which the firm operates (public utility services), SMA techniques, based on the collection of outward-looking competitor information, focus on competitor position prevailing in the strategy development process. Competitor position analyses are used to gain market share involving the identification of eligible targets in terms of new customers and geographical areas. Additionally, for strategy implementation, competitor information is more important than strategic cost information. The competitor information tends to monitor changes in market shares and levels of target achievement. However, the collection of costing

> information is useful for improving profit margins and profitability ratios over time. Costing information is periodically (monthly or quarterly) monitored.

The interviews also exhibited support for a positive association between cost strategy and SMA usage, particularly for strategic costing (H1a). This perception can be interpreted as highly rational because firms need strategic costing techniques, primarily based on target costing and quality costing, to provide important support for cost strategies in firms applying formal and structured approaches to strategy development and implementation.

For example, Interviewee G—from a company providing components and systems for the car industry that primarily competes with a cost strategy—commented:

> SMA practices based on strategic cost analysis are more important than the collection and analysis of competitor information. Target and quality costing play a fundamental role in strategy development and implementation.

In contrast with H2a, the statistical test (Table 7) documents no significant relationship between an international geographic orientation and SMA usage based on competitor accounting.

The interviews with participants in firms that compete with the international orientation strategy partially disagree with this survey result. We interpreted this opinion because internationalization, particularly with a differentiation strategy, creates more opportunity and increased risk. According to interviewees, competitor accounting is as important as strategic costing to supporting international strategy in firms applying formal and structured approaches to strategy development and implementation.

The comments provided by Interviewee B, from a company in the mechanical and electronic equipment industry that competes with an international strategy based on a differentiation strategy, were insightful:

> The formulation of organizational objectives is supported by the analysis of market evolution and the identification of potential outlets for new products that are the result of R&D activities. However, an appropriate introduction of these new products into new markets may become profitable only with particular attention to cost control from the development stage to pricing decisions.

The interviews also exhibited support for a positive association between international strategy and SMA usage. Competitor accounting is as important as strategic costing to supporting international strategy. Corporate accountants' perceptions can be interpreted as highly rational because firms need strategic costing techniques such as life-cycle costing, target costing and quality costing, along with competitor accounting techniques to provide important support for an international orientation, which is associated with a cost strategy in firms applying formal and structured approaches to strategy development and implementation.

For example, the comments provided by Interviewee A, from a company in the automotive industry that competes with an international strategy and a cost strategy, were also insightful:

> In the highly competitive global market in which our different business units operate, strategic cost information and on-going comparisons with competitor positions, which are formally analysed, are fundamental drivers in the definition of medium- and long-term strategic targets." […] "We collect this type of information to the extent of what is included in public reports on our major competitors. Volume and share information is collected by leveraging industry publications such as the IHS.

As a final qualitative interview step, the interviewees were asked to express their opinion on the structure and formality of SMA information, focusing on strategic costing and competitor accounting in strategy development and implementation. As Langley (1990: 17 and 21) suggests, "formal analysis—the systematic study of issues—can help organizations make better decisions […] the approach used focuses on written documents reporting the results of some systematic study of a specific issue". The interviews show that all seven companies use SMA information in their strategy processes. Six large companies use formal and structured analyses for both strategic costing and competitor accounting, and only one firm uses informal and unstructured SMA information in its strategic activities.

The comments provided by interviewee D, from a company in the farm tractor manufacturing and component distribution industry, were insightful:

> SMA information on costs and competitors is discussed and formally analysed, particularly with reference to product development and pricing. It is collected and appropriately reported to managers who are encouraged to pay attention to it. This information is obtained on a regular basis by means of comprehensive datasets produced by a specialized strategic consulting firm.

In conclusion, the interviews exhibited very high validity with the assumption that information on strategic costing and competitor accounting, as an SMA technique category to support strategy development and implementation, tends to be formal and structured in large firms.

6 Discussion and conclusion

In this section, we discuss the main results of the study according to the four primary objectives: to test the relationship between strategy types and SMA technique usage; to test the relationship between geographic orientation and SMA technique usage; to investigate whether external factors, such as environmental uncertainty and competitive forces, affect the SMA system; to assess corporate accountants' perception of strategic costing and competitor accounting supporting strategy choices.

The descriptive statistics of SMA techniques (Table 4), based on senior corporate accountants' perceptions, indicate a high SMA importance in large manufacturing companies.

The international comparison using the descriptive statistics reveal the common higher orientation towards the usage of competitor position monitoring (see Table 8). In addition, the balanced scorecard appears to be largely used in the

US, Italy and Slovenia. Furthermore, the results show a common high orientation towards target costing and quality costing in NZ, the US, Slovenia and Italy.

In this study, in contrast with the findings of descriptive statistics, a result that could appear surprising is the absence of a significant association between some strategic choices variables and SMA technique categories. The results of the hypotheses testing, presented in Table 8, provide valuable insights into the practice of large Italian companies.

First, the results of the hypothesis testing indicate that SMA usage does not depend on strategy type. While H1a and H1c are rejected, H1b is partially supported.

The rejection of H1a is very important because the empirical evidence contrasts with the theoretical accounting literature. In particular, H1a cannot be confirmed because the findings suggest that cost leaders do not use more SMA strategic costing techniques. This result mainly does not support the idea of Porter (1980) or of Langfield-Smith (2007), that strong cost controls are (more) appropriate when following a cost leadership positioning.

H1b is partially supported only for brand valuation (p value = 0.09), suggesting a greater use among differentiators. In this context, Cinquini and Tenucci (2010) found no support for the hypotheses that the usage rates of SMA techniques focused on competitors (customer and performance) are higher in differentiators (and prospector) companies than in cost leaders (and defenders). Furthermore, they emphasized the "loose coupling" between business strategy typologies and SMA techniques, arguing that a given SMA technique can be used to assist different strategic approaches. More generally, despite some empirical studies having addressed the use of management accounting systems in supporting the firm's strategy, particularly at the business unit level, no clear linkages have been identified (Chenhall 2003), and this study makes no exception. Finally, H1c cannot be confirmed because the results show that companies pursuing focus strategies do not seem to rely more on a holistic approach to SMA techniques.

Second, the results of the hypothesis testing indicate that SMA usage only marginally depends on geographic orientation. While H2a and H2c are not supported, H2b is marginally supported for brand valuation (p value = 0.04).

H2a cannot be confirmed because the findings suggest that companies oriented internationally do not make greater use of competitor accounting and strategic performance measurement. This result does not align with the view proposed by Hill (2009), who claims that firms operating mainly in international markets tend to use output controls focused on financial and non-financial performance metrics that are generally reflected in the use of performance measurement systems. However, to our knowledge, there are still few empirical studies on the relationship between the use of SMA techniques and the strategic choices regarding geographic orientation. H2b is marginally supported because the results suggest that companies oriented nationally make greater use only of brand valuation as a strategic decision-making technique. Our interpretation, consistent with Johnson et al. (2014), is that some large companies tend to occupy a niche, through new product technologies, which seems appropriate for a new growth in the national existing market using mainly the brand as a competition lever. Finally, H2c cannot be confirmed because the results show

that companies oriented nationally and internationally do not seem to rely more on a holistic approach to SMA usage.

Third, H3 postulates a positive relationship between SMA usage and external factors acting through environmental uncertainty and competitive forces. Here, some empirical studies support the relationship between environmental uncertainty and the use of management accounting information that is externally oriented, non-financial and forward-looking (Kalkhouran et al. 2015). However, in this study, the effect of environmental uncertainty on the use of SMA techniques is only limited to strategic pricing. In contrast, the influence of the five forces on SMA usage appears to be greater.

In conclusion, logit regression results show a positive influence of competitive forces on SMA technique usage, such as strategic pricing, balanced scorecard, risk analysis (management), target costing and life-cycle costing. These results provide evidence that competitive forces are external factors relevant for a strategy that may affect the SMA system (see, also, Haldma and Lääts 2002; Messner 2016).

In this study, a mixed methods approach was used to develop additional insight on SMA usage. The qualitative analysis, based on data collection and interpretation of interviews, tends to assess the fourth research objective on SMA usage based on corporate accountants' perceptions of strategic costing and competitor accounting supporting strategic choices.

The interview findings suggest some disagreement between the corporate accountants' perceptions and the conclusions drawn from the quantitative data (tests regarding H1 and H2). Indeed, some respondents emphasized the role of strategic costing techniques in supporting strategies mainly based on low costs, and others also revealed support for a positive association between international strategy and SMA usage. Interestingly, the interview findings exhibited the high validity of the assumption that information on strategic costing and competitor accounting tends to be formal and structured in six of the seven large firms considered. This is consistent with the results of Bhimani and Langfield-Smith (2007) in the U.K. The interview results, in line with Nixon and Burns (2012: 238), "exemplify the crucial importance of institutionalising the SMA system".

The results of this study should be viewed in the context of its limitations.

From a statistical perspective, the main limitation is associated with the number of observations included in the sample. For this reason, we adopted specific statistical inferential methods (e.g., the simulated p values in association tests). Furthermore, the adoption of a dichotomous scale to measure SMA usage can be considered another limitation in this work. Indeed, on the one hand, the problem is that a minor use in one company is considered equal to an extensive use in another one. On the other hand, obtaining a reliable measure of the level of use of SMA techniques can be much more complex, and it can cause other types of measurement errors. These limitations were mitigated through interviews to determine corporate accountants' perceptions of large companies. These differ in terms of industry and strategic choices, as the companies are competitive leaders in different markets.

Future research should recognize that SMA technique measurement based only on use or lack of use could be misleading, as companies can partially adopt a technique. In addition, future studies should consider cross-national investigations and

the role of SMA in business model innovation and new product-service development. In addition, the relationship between corporate accounting culture and the SMA design should be investigated.

Acknowledgements The authors are grateful to Alnoor Bhimani and Antonio Davila, who commented on a preliminary version of the paper. We also would like to acknowledge the helpful suggestions provided by the two anonymous reviewers.

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