The Role of Performance Measurement Systems in Strategy Formulation Processes

Xavier Gimbert, Josep Bisbe and Xavier Mendoza

Since most studies have focused on the role of strategic performance measurement systems (SPMSs) in communicating the firm’s strategy and facilitating its execution and control, little is known about the role they might potentially play in shaping strategy (re)formulation processes. In this paper, we examine whether organisations that use SPMSs engage in strategy formulation processes differently from those that use performance measurement systems (PMSs) which do not qualify as SPMSs, or those which do not use any type of PMS. In particular, we hypothesise that the use of SPMSs will relate to 1) a greater frequency of strategy (re)formulations, and 2) a more comprehensive strategic agenda, reflected through a greater number and a wider variety of strategic decisions in each strategy (re)formulation. Empirical data gathered from surveys completed by 349 CEOs of medium and large Spanish companies provide support for a positive association between the use of SPMSs and both the number and variety of strategic decisions taken in each strategic review. Our findings suggest that the use of SPMSs (as opposed to other forms of PMS) by an organisation’s top management team translates into a more comprehensive strategic agenda. Prior studies have shown that strategic agendas shape the extent and direction of corporate strategic change.

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Introduction
Since the mid-1980s, increasing attention has been paid to the study of performance management systems (PMSs) as tools for effective strategy implementation. More precisely, in recent years special interest has been placed on strategic performance measurement systems (strategic PMSs or SPMSs), a subset of multi-dimensional causal-oriented PMSs which includes models such as...
Like most PMSs, SPMSs were primarily conceived as tools for the successful implementation of strategy. Consequently, most studies of SPMSs have focused on their role regarding the translation of strategy into action, concluding that SPMSs are particularly instrumental in this regard.

While most practice and research has emphasised the use of SPMSs regarding strategy implementation, their potential role in strategy formulation and in intertwining strategy formulation and strategy implementation has seldom been explored. However, a limited number of recent stand-alone in-depth case studies have suggested that SPMSs may be effectively used for these purposes, because they may help question the strategic assumptions being made and identify potential problems with the firm’s strategy. This paper aims to add to this emerging literature by enhancing the understanding of how SPMSs may influence some important attributes of strategy formulation processes. We examine two research questions related to the processes of strategy (re)formulation: (1) whether organisations that use SPMSs (re)formulate their strategy more frequently, and (2) whether the use of SPMSs influences the nature of the organisation’s strategic agenda resulting from strategy (re)formulation processes.

Data gathered from surveys completed by 349 CEOs of medium and large Spanish companies did not provide evidence of the use of SPMSs being associated with a higher frequency of strategy (re)formulation; but it did provide support in favour of a positive association between the use of SPMSs and both the number and the variety of decisions made in each strategy (re)formulation, and hence indicated that the use of SPMSs can influence the nature of the strategic agenda. Interestingly, while we found significant differences between the nature of the strategic agendas of those firms using SPMSs and those not using them, we did not find any difference regarding any of the variables under study between firms that use PMSs which do not qualify as SPMSs and firms that have no PMS in place at all. These findings support the arguments for the relevance of the specific configuration of the dimensions that constitute a strategic PMS.

Overall, our study sheds light on the connection between SPMSs and strategy-making. It suggests that SPMSs influence strategy (re)formulation by stimulating the development within the organisation of a more comprehensive strategic agenda, which translates into a larger and more diverse array of strategic decisions. In doing so, we contribute to previous research on the role of managerial cognition in strategic action by discussing how instruments that were primarily conceived to facilitate strategy implementation can increase the ability of top management teams to acquire and process strategically relevant information about the organisation and its environment, and translate it into strategic decisions. This discussion provides new insights on how strategy formulation and strategy implementation processes can be intertwined at an instrumental level. We also contribute to previous research on PMSs, in that our findings indicate that the implications of SPMSs are not confined to alignment with a predefined strategy or to implementation issues, as had been assumed in the majority of previous studies, but that they also extend to strategy (re)formulation issues. In addition, we provide evidence that helps advance knowledge concerning the specific attributes of SPMSs that help stimulate the development of a more comprehensive corporate strategic agenda at top management levels.

**SPMSs influence strategy (re)formulation by stimulating the development within the organisation of a more comprehensive strategic agenda**

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The remainder of the paper is divided into four sections. In the first section we provide a brief review of the relevant theoretical background, and develop the arguments that lead to a series of testable hypotheses regarding expected associations between SPMSs and some specific attributes of strategy formulation. The second section discusses the research method, and is followed by a third section in which the results are presented. The final section concludes by discussing the results and their implications, evaluating the limitations of the study and summarising its findings.

Strategy formulation and SPMSs: prior research and hypotheses

Strategy formulation

The distinction between strategy formulation and strategy implementation can be traced back to the origins of strategic management as a discipline. On the one hand, strategy formulation refers to the process through which a firm defines its overall long-term direction and scope. It involves establishing the way a company creates value through the configuration of its activities and resources in the markets in which it operates. Strategy formulation is a purposeful, deliberate exercise to develop a company’s competitive advantage and thus enhance its performance. Strategy implementation, on the other hand, refers to the process of turning strategy into action and monitoring and assessing the results. While they are conceptually different, it was soon recognised that formulation and implementation are interdependent, in that a well-formulated strategy needs to take into account the way it will be implemented, and it is through the learning in its implementation that a company’s strategy is refined and eventually reformulated.

The way organisations formulate strategy has become one of the most contested areas of debate in the strategic management field. In the conventional approach (the so-called ‘prescriptive’ or ‘design’ school of thought), strategy development is mainly the result of a systematic, rational process of deliberate planning by a top management team, which is then communicated to the organisation for implementation. In large companies, this process typically occurs through formal strategic planning systems. An alternative approach, based on descriptive studies of strategy formulation, sees strategy as the result that emerges from a complex, multi-level process of organisational decision-making. The realised strategy is thus the outcome of two simultaneous processes: on the one hand, the execution of the strategy as conceived by the top management team (deliberate strategy) and, on the other, the cumulative effect of day-to-day decision-making in a changing environment which eventually results in the formation of emergent strategies. The fundamental critique of the ‘design’ school of thought, and by extension of strategic planning, is that its approach creates a gulf between formulation and implementation that precludes learning and creativity. Overall, the descriptive perspectives see strategy-making as an iterative process involving experimentation and feedback; they stress a greater overlap and interplay between strategy formulation and strategy implementation.

Interestingly, the practice of strategic planning in large companies has undergone a significant transformation since the 1980s, as can be seen by the emergence of new types of strategic planning systems that combine the design and emergence approaches to strategy formulation and implementation. A well-known case is that of the oil majors, where strategic planning responsibility has shifted from corporate planning departments to line managers. Thus, while corporate headquarters set the overall direction and scope of the organisation, as well as setting guidelines for the development of strategic plans, once these plans are decided upon, the divisional and business unit managers have considerable leeway in adjusting, adapting and experimenting. In contrast,
in the General Electric Company (GE), strategic planning has remained integrated with corporate-level strategy development and decision-making. A recent in-depth study into GE’s strategic planning practices highlights that strategy development, operational planning and manpower planning are activities that are tightly coupled with decision-making channels integrating participants from different organisational levels. GE’s approach stresses that strategic planning is a responsibility that can be effectively shared between both corporate executives and operating unit managers.7

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Overall, empirical evidence shows that modern versions of formal strategy formulation practices are common in modern medium and large-sized firms and that, under certain conditions (such as an effective link between strategy formulation and strategy implementation, or operating managers having enough room to take autonomous action), they have a positive effect on performance.8

Strategic performance measurement systems (SPMSs) and strategy formulation

In recent years increasing emphasis has been placed on the study of strategic PMSs (SPMSs). While most practice and research has emphasised the use of SPMSs regarding strategy implementation, our concern here is with the role of strategic PMSs (SPMSs) in the strategy (re) formulation process. But we deem it important first to explain how PMSs and SPMSs were defined in our study.

Performance Measurement Systems (PMSs) are concise sets of (financial and/or non-financial) metrics that support the decision-making processes of an organisation by gathering, processing and analysing quantified information about its performance, and presenting it in the form of a succinct overview.9 Strategic Performance Measurement Systems (SPMSs) are a subset of PMSs. In this study, we specifically define SPMSs as those PMSs that support the decision-making processes of an organisation through a series of distinctive features such as: 1) the integration of long-term strategy and operational goals; 2) the provision of performance measures in the area of multiple perspectives; 3) the provision of a sequence of goals/metrics/targets/action plans for each perspective; and 4) the presence of explicit causal relationships between goals and/or between performance measures.10 Instances of well-established models providing frameworks and guidelines for SPMS design include (but are not limited to) tableaux-de-bord, SMART Performance Pyramid Systems, Balanced Scorecards and Performance Prisms.11

Hitherto most studies have focused on the role of strategic PMSs in communicating the firm’s strategy and facilitating its execution and control; as a consequence, little attention has been paid to the active role they can potentially play in the (re)formulation of company strategy. Some very generic claims about SPMSs being able to support both strategy (re)formulation and implementation have been made,12 but empirical evidence on the specific role and influence of their use in strategy (re)formulation is still scarce. Yet some limited case-based evidence suggests that they can be used to challenge and question strategic assumptions being made, increasing the chance of identifying problems derived from mistaken assumptions and therefore encouraging their revision.13 At a more instrumental level, statistical analyses of causal links between performance measures have been proposed as useful devices in identifying potential problems in the firm’s strategy, and in testing and adapting such strategy.14 While this limited empirical evidence indicates that SPMSs may play an active role in strategy (re)formulation processes, not much is known about the connection between the use of SPMSs and the attributes of these processes. We next develop
a line of reasoning which leads us to expect that SPMSs will influence some relevant attributes of the strategy formulation process.

Hypotheses
The literature on strategic choice and on the role of upper echelons in strategic management emphasise the importance of top managers in strategy formulation and implementation. Both streams argue that, while many people may participate in scanning and processing data, it is at the top management level that information is brought together and interpreted for company-wide action. Top managers, as boundedly rational individuals, use mental representations as cognitive structures that support them in understanding, reasoning and predicting. Thus, the mental representations that top managers develop about their organisation and its environment are instrumental in defining the organisation’s strategic agenda.

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Prior research based on cognitive and social psychology theories has shown that PMSs (including SPMSs) help frame managers’ mental representations because of PMSs’ informational effects. These informational effects ‘depend not only on the information [PMSs] provide but also how boundedly rational individuals use heuristics to search and process this information, how [PMSs] influence the choice and use of these heuristics, and how [PMSs] influence the way individuals form and use mental representations of their organisations and environment’.

In the case of SPMSs, these informational effects can be manifested in three broad areas in which they may play a differential active role in strategy (re)formulation: the decision content, the analytical dimensions of the process, and the social dimensions of the process. Regarding the first area, an SPMS may provide input which is relevant for the purposeful analysis and reflection that precedes strategy selection. SPMSs capture multiple perspectives of the organisation’s performance, and articulate representations of the links between indicators, actions and desired outcomes within and across perspectives. By doing so, SPMSs encourage extensive scanning behaviour and help produce more informed assessments (e.g. of the market structure, the nature of customer needs, the deployment of the organisation’s assets) than one-dimensional non-causal PMSs do.

A second important area of the potential contribution an SPMS can make to strategy (re)formulation refers to the rational, analytical dimensions of the decision process itself. Strategy formulation processes are considered to play a significant role in creating a network of information and forcing managers to focus on the future, encouraging rigorous communication on strategic issues, and improving co-ordination. SPMSs are likely to be instrumental in these pursuits, since they facilitate the efficient acquisition, compilation, communication and diffusion of information about strategic uncertainties and strategic priorities, and they furthermore provide a common basis for a uniform framing of strategic information.

Finally, regarding the third area, it is important to bear in mind that strategy formulation processes also have social dimensions. Strategy formulation plays a significant role in creating a forum for negotiating, rationalising, legitimising, announcing, selling and the ultimate acceptance of strategic decisions. SPMSs can be expected to have an effect on the way this forum is enacted. By framing the available information in a concise, explicit and shared manner, the use of an SPMS helps channel potential divergences from diverse perspectives, increases the likelihood of shared mental representations and commonly agreed interpretations, and reduces the risk of effort being dissipated.
Consequently, we expect that, through the combination of these interventions in the decision content as well as in the analytical and social dimensions of the processes of strategy (re)formulation, the use of SPMSs will influence both the frequency of such processes and the nature of the organisation’s strategic agenda resulting from them.

Regarding the frequency of strategy formulation processes, it is plausible that the use of SPMSs by top management will increase the awareness of any need to formulate new strategies or reformulate existing ones. By capturing multiple perspectives on the organisation’s performance, encouraging extensive scanning behaviour and helping produce assessments with more informed content, the use of SPMSs should, by extension, help focus greater attention on the extent to which strategic assumptions are inadequate or mistaken and how necessary or urgent such a strategic review might be.

Moreover, by framing strategic information in a concise, organised and explicit manner, the use of SPMSs is expected to provide an efficient framework for coming up with faster responses (analytical dimensions of the process). This is likely to be reinforced by the fact that SPMSs provide a forum for channelling potential divergences, making it more likely that commonly agreed interpretations can be hammered out on the need for action (social dimensions of the process). Consequently, an organisation whose top management team uses SPMSs is likely to be aware of the need for strategy (re)formulation earlier than if it does not use SPMSs. Assuming that the firm is able to turn awareness into activated responses, it is reasonable to deduce that earlier awareness will mean that a move towards strategy (re)formulation is made earlier and, consequently, more often than would be the case without an SPMS. These arguments lead to the following hypothesis:

**Hypothesis 1 (H1).** Organisations that use strategic PMSs engage in strategy (re)formulation processes more frequently than organisations that do not use strategic PMSs.

Studies on the role of managerial cognition have shown that the organisation’s strategic agenda ‘acts as a critical vehicle through which strategy formulation influences strategic change’. Given the informational effects of strategic PMSs and their potential role in the decision content as well as in the analytical and social dimensions of strategy (re)formulation processes, we also expect that their use will affect the nature of the organisation’s strategic agenda resulting from these processes.

It has already been mentioned that SPMSs capture multiple perspectives of the organisation’s performance and articulate representations of the links between indicators, actions and desired outcomes through causal chains such as success maps or strategic maps. Both endeavours (i.e. capturing multiple perspectives and representing links) require SPMSs to gather more sophisticated information than is required by other single-perspective or non-causal PMSs. We expect this greater sophistication to be specifically expressed in two forms: 1) the acquisition and processing of a greater quantity of information content, and 2) a wider diversity of acquired and processed information content (as compared to single-perspective or non-causal PMSs). Hence, SPMSs...
make it possible that top managers ground decisions on more, and more varied, information content, and consequently that they include a larger and more diverse range of strategic issues in their strategic agenda.

The translation of more sophisticated information content into a strategic agenda with a larger and wider range of strategic issues is likely to be further facilitated by the role of SPMSs in both the analytical and the social dimensions of the strategy (re)formulation process. As far as the analytical dimensions are concerned, we expect SPMSs to increase the ability of top managers to acquire, process and decide upon more, and more varied, strategically relevant information in a more rigorous, organised, coordinated and efficient manner, avoiding the undesired consequences of potential information overload. Finally, and regarding the social dimensions of the (re)formulation process, SPMSs introduce a call for integration and for a holistic view in the development of shared mental representations and commonly agreed interpretations, as well as in the negotiation, legitimisation and ultimate acceptance of strategic decisions.31

Hence: To sum up, we expect the use of SPMSs by an organisation’s top management team will translate into a more comprehensive strategic agenda in terms of both size and diversity than is the case in organisations that either do not use any PMS, or use a single-perspective or non-causal PMS. Consequently, whenever the top management team of an organisation engages in a process of strategy (re)formulation, one can expect both the number and the variety of decisions taken during that process to be positively affected by the use of SPMSs, thus reflecting a more comprehensive strategic agenda.32

The use of SPMSs by an organisation’s top management team will translate into a more comprehensive strategic agenda in terms of both size and diversity

**Hypothesis 2 (H2).** Organisations that use strategic PMSs make a greater number of decisions in each strategic (re)formulation than organisations that do not use strategic PMSs.

**Hypothesis 3 (H3).** Organisations that use strategic PMSs make a wider variety of decisions in each strategic (re)formulation than organisations that do not use strategic PMSs.

**Research method**

Empirical data was gathered through survey questionnaires that were distributed and returned by mail. The questionnaires were sent to senior managers drawn from a sample of medium and large-sized Spanish firms (minimum turnover of 10 million euros and minimum of 50 employees). Our database comprised unlisted firms from manufacturing and service industries located in Catalonia (Spain). Our exploitation of the SABI 2003 database (Iberian Balance Sheet Analysis System, published by Informa D&B, containing general information and annual accounts of Spanish and Portuguese firms) yielded 2,021 firms meeting the screening criteria. After two rounds of mailing, a total of 357 questionnaires were returned. Out of these, 349 were complete and usable, representing a response rate of 17.27 per cent (see Appendix A for further details on sampling issues).

Firms were classified into three subgroups on the basis, first, of whether they reported using a PMS or not and, secondly, of the scores they self-reported regarding the constitutive dimensions of strategic PMSs. A first subdivision was made using a questionnaire item that asked senior managers whether a concise set of indicators (financial and/or non-financial) was used in the firm for gathering, processing and analysing quantified information about its performance, for obtaining a succinct overview of the company and, ultimately, for decision-making purposes. While we
took it for granted that most if not all firms would produce financial statements (for regulatory or tax purposes if nothing else), only those firms who reported using concise sets of indicators (financial and/or non-financial) were considered to use a PMS as defined in this study. Hence, the usable sample of 349 firms was first split in two groups: 87 firms reported not using a PMS (the No-PMS subgroup, \( n = 87; \) 24.9 per cent); and 262 firms reported using a PMS (the PMS subgroup, \( n = 262; \) 75.1 per cent).

The PMS subgroup was further subdivided in two: the PMS — No SPMS and the SPMS subgroups. Firms that reported using a PMS provided further information about the extent to which the four constitutive dimensions of SPMSs (i.e. the integration of long-term strategy and operational goals; the presence of explicit causal relationships between goals and/or between performance measures; the inclusion of a sequence of goals/targets/action plans; and the provision of performance measures in the area of multiple perspectives) were present (see Appendix B for questionnaire items).33 Descriptives of the variables capturing these dimensions are reported in Table 1.

A firm that had a PMS in place was considered to specifically use an SPMS only if it showed scores above a pre-determined threshold for each of the four constitutive dimensions (i.e. at least two perspectives should be gathered and, for the remaining dimensions, scores should be in the upper third of the theoretical range). Out of the 262 firms in the PMS subgroup, a subset of 139 firms exceeded the thresholds for each of the constitutive dimensions and, for purposes of this study, were consequently considered to use a strategic PMS (the SPMS subgroup, \( n = 139\)). The 123 firms that did not exceed the thresholds in one or more of the constitutive dimensions were considered to use a PMS which did not qualify as a strategic PMS (the PMS — No SPMS subgroup, \( n = 123\)).

In order to measure frequency, respondents reported the number of times the firm had revised its strategy through formal strategy formulation processes in the last three years. The two variables related to the nature of the strategic agenda — number and variety of decisions — were made operational through an instrument in which respondents indicated the number of times strategic decisions regarding different strategic issues were made in formal strategy formulation processes over that period (for further details on variable measurement issues, see Appendix A. Questionnaire items are reported in Appendix B.)

Respondents reported the number of times the firm had revised its strategy through formal strategy formulation processes in the last three years

Results
We analysed differences in the distribution of the scores regarding 1) frequency of strategy (re)formulation, 2) the number of decisions in each strategy (re)formulation, and (3) the variety of decisions in each strategy (re)formulation through three types of examinations. First, we analysed these differences between two subgroups of firms: i) firms that use a strategic PMS, and ii) firms that do not use an SPMS. Second, we extended this analysis by additionally comparing the distributions of the three mentioned attributes of strategy formulation between three subgroups of firms: i) firms that use an SPMS; ii) firms that use a PMS not qualifying as an SPMS; and iii) firms that do not use any PMS. Finally, we considered it worth complementing the analysis by looking at whether any of the individual constitutive dimensions of SPMSs appeared to be particularly associated with any of the studied attributes of strategy formulation. Table 2 summarises the connections between hypotheses and tests, including complementary analyses. It also contains an overview of the results of the tests and their level of confidence.
Table 1. Descriptive statistics

<table>
<thead>
<tr>
<th></th>
<th>Theoretical range</th>
<th>Min</th>
<th>Max</th>
<th>Mean</th>
<th>Std Dev</th>
<th>Median</th>
<th>Bivariate Spearman Correlations</th>
</tr>
</thead>
<tbody>
<tr>
<td>DIMSPMS1</td>
<td>2.00—10.00</td>
<td>2.00</td>
<td>10.00</td>
<td>7.86</td>
<td>1.47</td>
<td>8.00</td>
<td>0.533**</td>
</tr>
<tr>
<td>DIMSPMS2</td>
<td>3.00—15.00</td>
<td>3.00</td>
<td>15.00</td>
<td>11.83</td>
<td>1.92</td>
<td>12.00</td>
<td>0.190** 0.233**</td>
</tr>
<tr>
<td>DIMSPMS3</td>
<td>0.00—4.00</td>
<td>0.00</td>
<td>4.00</td>
<td>3.58</td>
<td>0.89</td>
<td>4.00</td>
<td>0.207** 0.251** 0.310**</td>
</tr>
<tr>
<td>DIMSPMS4</td>
<td>0.00—8.00</td>
<td>0.00</td>
<td>4.00</td>
<td>2.89</td>
<td>1.48</td>
<td>3.00</td>
<td>0.055 0.105 0.087 —0.017</td>
</tr>
<tr>
<td>FREQ</td>
<td>0.00—36.00</td>
<td>0.00</td>
<td>20.00</td>
<td>2.19</td>
<td>1.97</td>
<td>2.00</td>
<td>0.105 0.270** 0.155* 0.225** 0.430**</td>
</tr>
<tr>
<td>NUMDEC</td>
<td>0.00—150.00</td>
<td>0.00</td>
<td>68.00</td>
<td>27.87</td>
<td>12.91</td>
<td>27.00</td>
<td>0.071 0.207** 0.147* 0.238** 0.262** 0.782**</td>
</tr>
</tbody>
</table>

DIMSPMS1 = integration of long-term strategy and operational goals; DIMSPMS2 = causal relationships; DIMSPMS3 = sequence goals/targets/plans; DIMSPMS4 = multiple perspectives; FREQ = frequency of strategy (re)formulation; NUMDEC = number of strategic decisions; VARDEC = variety of strategic decisions. n = 349; ** p < 0.01; * p < 0.05 (two-tailed tests).
Table 2. Summary of hypotheses and corresponding tests and results

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Type of examination</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Comparison STRATEGIC PMS vs. No STRATEGIC PMS</td>
</tr>
<tr>
<td><strong>H1</strong>: Organisations that use strategic PMSs engage in strategy (re)formulation processes more frequently than organisations that do not use strategic PMSs.</td>
<td>● No significant difference</td>
</tr>
<tr>
<td><strong>H2</strong>: Organisations that use strategic PMSs make a greater number of decisions in each strategic (re)formulation than organisations that do not use strategic PMSs.</td>
<td>● Significant difference between STRATEGIC PMS and No STRATEGIC PMS ($p &lt; 0.01$)</td>
</tr>
<tr>
<td><strong>H3</strong>: Organisations that use strategic PMSs make a wider variety of decisions in each strategic (re)formulation than organisations that do not use strategic PMSs.</td>
<td>● Significant difference between STRATEGIC PMS and No STRATEGIC PMS ($p &lt; 0.01$)</td>
</tr>
</tbody>
</table>
Regarding the first type of examination, Table 3, Panel A shows in further detail the results of the battery of Mann-Whitney U tests used to compare the distributions of the three variables between the two subgroups. The reported results indicate that there is no significant difference in strategy (re)formulation frequency between organisations that use SPMSs and those that do not. In contrast, evidence provided by the data suggests that organisations using SPMSs engage in a greater number and wider variety of decisions ($p < 0.01$ for both variables) in each strategy (re)formulation. Multiple regressions controlling for size and industry, reported in Table 3, Panel B, provided consistent results.

In the second examination, we extended the analysis to the pairwise comparisons between the three subgroups of firms. A battery of Jonckheere-Terpstra tests supported the hypothesis of significant differences between the three subgroups of firms with regard to number of decisions ($p < 0.01$) and variety of decisions ($p < 0.01$), but once again not with regard to frequency. In order to specifically determine significant differences between subgroups, we used Games-Howell tests (Table 4, Panel A). Interestingly, no significant difference in any of the studied attributes of strategy formulation was observed when comparing firms that do not have any PMS in place with firms that use a PMS which does not qualify as an SPMS (comparison (3) in Table 4, Panel A). In contrast, significant differences in both the number and variety of decisions can be observed when comparing firms that use an SPMS with firms that use a PMS which does not qualify as an SPMS (comparison (1), $p < 0.05$), or when comparing firms that use an SPMS with firms that do not use any PMS (comparison (2) in Table 4, $p < 0.01$). These results were confirmed by a multiple regression controlling for size and industry (Table 4 Panel B).

### Table 3. Comparison of attributes of strategy formulation process between the two subgroups of firms (SPMS vs. No SPMS)

#### Panel A. Mann-Whitney U tests

<table>
<thead>
<tr>
<th></th>
<th>STRATEGIC PMS ($n = 139$) vs. No STRATEGIC PMS ($n = 210$)</th>
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<tbody>
<tr>
<td></td>
<td>Z</td>
</tr>
<tr>
<td>Frequency</td>
<td>−1.429</td>
</tr>
<tr>
<td>Number of decisions</td>
<td>−3.291</td>
</tr>
<tr>
<td>Variety of decisions</td>
<td>−2.935</td>
</tr>
</tbody>
</table>

#### Panel B. Multiple regression

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Number of decisions</th>
<th>Variety of decisions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>3.67** (2.52)</td>
<td>37.58** (4.09)</td>
<td>14.77** (5.23)</td>
</tr>
<tr>
<td>SPMS</td>
<td>0.36 (1.49)</td>
<td>4.57** (2.98)</td>
<td>1.26** (2.67)</td>
</tr>
<tr>
<td>Size</td>
<td>−0.08 (−0.65)</td>
<td>−0.28 (−0.37)</td>
<td>0.06 (0.26)</td>
</tr>
<tr>
<td>Industry</td>
<td>†</td>
<td>†</td>
<td>†</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.03</td>
<td>0.10</td>
<td>0.10</td>
</tr>
<tr>
<td>$F$ ($p$)</td>
<td>0.54 (0.91)</td>
<td>2.32 ($&lt;0.01$)**</td>
<td>2.34 ($&lt;0.01$)**</td>
</tr>
</tbody>
</table>

SPMS = Dummy variable if SPMS = 1, otherwise 0. Size = Ln (Sales). Industry = 12 dummy variables which represent groups of codes derived from CNAE industry classification. † Industry controls included but coefficients not reported. None of the dummy variables for industry was significant. $n = 349$; ** $p < 0.01$; * $p < 0.05$ (two-tailed tests) ($t$-statistic in parenthesis).
Finally, and in order to explore whether any one of the individual constitutive dimensions of an SPMS is particularly influential, we used non-parametric measures of correlation between the three attributes of strategy formulation processes on the one hand, and each of the dimensions on the other. Table 5 focuses on reporting these specific correlations, which are extracted from Table 1 where all correlations were included. As shown in row 1 in Table 5, there is no significant correlation between strategy (re)formulation frequency and any of the four dimensions that constitute an SPMS. In contrast, as indicated in row 2, there is a significant correlation between the number of decisions and both the provision of performance measures in the area of multiple perspectives and the presence of explicit causal relationships between goals and/or between performance measures ($p < 0.01$ in both cases). The correlation between number of decisions and provision of a sequence of goals/targets/action plans is also significant, though less so ($p < 0.05$). No significant correlation was found between the number of decisions and the simple integration of long-term strategy and operational goals. Regarding the connection between the variety of decisions and the constitutive dimensions of the SPMS, the correlation analysis produced results analogous to those regarding the number of decisions (see row 3 in Table 5).
Discussion

Strategic performance measurement systems (SPMSs) were initially conceived as instruments for strategy implementation. However, the results reported in Tables 3 to 5 suggest that SPMSs, as actually used by companies, not only have consequences for implementation but are also associated with specific patterns of strategy formulation. Organisations that use SPMSs formulate strategy differently from those that do not. More precisely, our findings indicate that, even if the use of SPMSs does not appear to significantly influence the frequency of strategy (re)formulation processes, it is associated with the nature of the strategic agendas that arise from these processes.

As just mentioned, the results in Table 3 do not support the hypothesis that use of SPMSs is linked to a greater frequency of strategy (re)formulation. Several ex-post arguments may help explain this unexpected finding. First, if SPMSs were in fact instrumental in formulating more adequate strategies, then it could be assumed that the use of SPMSs implies that strategic reviews will be less necessary or less urgent (hence offsetting the implications of an increased awareness). Second, formal strategy reformulation exercises are often pre-scheduled according to some pre-established, albeit flexible, scheme. The periodicity of this scheme depends on factors such as industry turbulence, the organisation’s proactiveness and the perceived cost-benefit of the exercise, but is less likely to be affected by the use of specific management tools such as SPMSs. Finally, even if the use of SPMSs may reveal changes in internal or external circumstances and the possible need for some strategic responses, this can be attained by means other than formal strategy (re)formulation processes. Indeed, if such processes in response to strategic discontinuities became too frequent, it could make the whole process routine and demotivating for managers. In order to avoid this, organisations can either respond by engaging in limited, essentially incremental strategic adaptations arising from very focused formal processes, or respond on the basis of a stream of local, decentralised, emergent decisions that derive from largely informal processes.

Formal strategy reformulation exercises are often pre-scheduled according to some pre-established, albeit flexible, scheme.

There are no significant correlations between strategy (re)formulation frequency and any of the four dimensions that constitute an SPMS

Table 5. Spearman correlations between attributes of strategy formulation and constitutive dimensions of strategic PMS

<table>
<thead>
<tr>
<th></th>
<th>Integration of long-term strategy/operational goals</th>
<th>Multiple perspectives</th>
<th>Sequence of goals/targets/plans</th>
<th>Causal relationships</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
<td>0.055</td>
<td>-0.017</td>
<td>0.087</td>
<td>0.105</td>
</tr>
<tr>
<td>Number of decisions</td>
<td>0.105</td>
<td>0.225**</td>
<td>0.155*</td>
<td>0.270**</td>
</tr>
<tr>
<td>Variety of decisions</td>
<td>0.071</td>
<td>0.238**</td>
<td>0.147*</td>
<td>0.207**</td>
</tr>
</tbody>
</table>

$\text{n = 349; }^{**} p < 0.01; ^{*} p < 0.05.$
The results of our study are consistent with the claim that the use of SPMSs influences strategy-making by increasing the managers’ ability to develop more comprehensive strategic agendas. Whenever top management teams using SPMSs engage in strategy (re)formulation processes, the nature of their strategic agendas is reflected in a greater number and wider variety of strategic decisions in each strategy (re)formulation process than is the case in organisations not using SPMSs. Note the finding in Table 4 — what makes a difference in the nature of the organisation’s strategic agenda (measured by the number and variety of decisions taken in each formal strategy (re)formulation process) is not the mere presence and use of any PMS. Indeed, as far as number and variety of decisions in strategy (re)formulation are concerned, whether an organisation does or does not have a PMS in place is irrelevant. What seems to be associated with the size and variety of the decision array in the strategy formulation process is precisely the use of the specific configuration of dimensions that constitute an SPMS. It is the use of an SPMS, and not the use of any PMS, which contributes to a greater awareness of the multi-faceted complexity of organisational reality. SPMSs appear to provide more effective channels to represent these complexities and put them on the strategic agenda than other PMSs.

It is the use of an SPMS, and not the use of any PMS, which contributes to a greater awareness of the multi-faceted complexity of organisational reality.

In this paper, we argue that SPMSs influence the nature of the strategic agenda because of their specific informational effects. Following this line of reasoning, the informational effects of SPMSs show themselves through decision content (i.e. extensive scanning, more informed assessments); in terms of the analytical dimensions of the strategy (re)formulation process (i.e. the greater rigour, coordination and efficiency resulting from the multidimensionality and causal links provided by the SPMS frameworks) and in terms of the social dimensions of the process (i.e. the forum provided by the SPMS through which top managers hammer out a shared mental representation of the firm’s strategy, and negotiate and legitimise such strategy). We have argued that the combination of these informational effects fosters top management’s awareness and shared understanding of the complexities facing their firm, and in so doing, helps them draw more comprehensive strategic agendas. We acknowledge that, while this line of reasoning has been used in this paper to shape our theory development and our expectations, our research design does not allow us to separately test or estimate the implications of each of the informational effects of SPMSs. In any case, our findings regarding the association between use of SPMSs and the nature of the strategic agenda appear to be consistent with this line of reasoning.

Finally, the results in Table 5 suggest that the effects of the use of SPMSs on the number and variety of strategic decisions taken in each strategy (re)formulation process are primarily associated with two constitutive dimensions of SPMSs, i.e. the inclusion of multi-perspective indicators and the inclusion of cause-effect linkages. In contrast, the number of decisions and the variety of decisions appear to be weakly related and unrelated respectively to the presence of a sequence of goals/targets/action plans or the integration of long-term strategy and operational goals. These findings are in line with prior studies, which found that multiple perspectives encourage extensive scanning behaviour and that the inclusion of causal relationships fosters strategy review and organisational learning. Furthermore, it is consistent with the argument that most of the added value provided by SPMSs stems from the dialogue, collective discussion and learning arising during its construction and (re)design, rather than from subsequent monitoring of deviations from preset performance targets. The choice of multi-perspective indicators and the establishment of cause-effect linkages are doubtless good opportunities for dialogue, collective discussion on and learning about the firm’s configuration of activities and resources.
Most of the added value provided by SPMSs stems from the dialogue and learning arising during its construction, rather than from subsequent monitoring of deviations from preset performance targets

Conclusion
This study contributes towards a better understanding of the extent to which strategic performance measurement systems, primarily conceived for strategy implementation purposes, influence strategy formulation processes. We argue that the use of SPMSs has an impact on the nature of the strategic agendas arising from the strategy (re)formulation processes.

Our line of reasoning draws on prior research based on cognitive and social psychology theories, which has shown that the use of SPMSs helps frame managers’ mental representations because of their informational effects. These effects are manifested in three broad areas of strategy formulation processes: decision content (e.g. more informed content), analytical dimensions of the process (e.g. more rigour, coordination, efficiency) and social dimensions of the process (e.g. provision of a forum for negotiation and legitimisation). We expect the combination of these effects to foster greater awareness and a shared understanding among top managers with regard to the complexities facing their firms which, in turn, should enable top managers to draw up more comprehensive strategic agendas.

The focus of our paper is the association between the use of SPMSs and the nature of the strategic agendas resulting from the strategy formulation processes. In generic terms, we argue that organisations using SPMSs engage in strategy formulation processes differently from those not using SPMSs. More specifically, we hypothesise that firms using SPMSs and firms not using SPMSs would present strategic agendas with different natures as reflected in the number and variety of decisions they contained. Empirical data gathered from surveys involving 349 CEOs in medium and large companies have provided support for a positive association between the use of SPMSs and both the number and the variety of decisions taken in each strategy (re)formulation, hence suggesting that SPMSs do have an influence on the nature of the strategic agenda.

Interestingly, we observed no difference in any of these variables when we compared firms using PMSs that do not qualify as SPMSs and firms that do not have any PMS in place. These findings lend support to the argument that it is precisely the specific configuration of features that sets SPMSs apart from other PMSs that is most relevant here. Furthermore, a separate analysis of the effects of each of the dimensions constituting a SPMS suggested that the detected effects of their use are primarily associated with the inclusion of multi-perspective indicators and of cause-effect linkages in the design of the SPMS.

The effects of SPMS use are primarily associated with the inclusion of multi-perspective indicators and of cause-effect linkages in their design

While the results of this study highlight the role of the use of SPMSs in strategy formulation processes, certain limitations should be noted. First, our sample was selected from medium and large manufacturing and service firms in a given geographical context, and one should be cautious about generalising the results to other contexts. Second, future studies in this area should also use more refined measurement instruments and, where feasible, multi-source measures. Finally, while cross-sectional, large sampling has the benefit of providing external validity when testing predicted associations, strict causality cannot be claimed. In order to better understand the dynamics and qualitative aspects underlying the relationships found in this study, we recommend further
longitudinal case studies be conducted to extend and complement our findings. We also encourage further research on how various specific SPMS models compare in terms of their influence on strategy formulation. This line of investigation might be extended to include comparison with management tools other than SPMSs.

We encourage further research on how various specific SPMS models compare in terms of their influence on strategy formulation

Further research might also investigate the antecedents, consequences and dynamics of the different manifestations of the informational effects. This might provide knowledge on how and why decision content and analytical and social dimensions of the strategy formulation process play separate or differential roles in influencing the nature of the strategic agenda. In-depth case studies are a promising avenue for such research. Future studies may also explore the implications for the quality and impact on performance of SPMS-inspired decisions.

Notwithstanding these limitations, this study has provided evidence of the relevant role of the use of SPMSs in shaping corporate strategic agendas resulting from strategy (re)formulation processes. Top management teams in firms using SPMSs engage in a greater number and wider variety of strategic decisions in each strategy (re)formulation process than those in firms not using SPMSs, thus producing more comprehensive strategic agendas. This is a highly relevant finding, as strategic agendas define the extent and direction of strategic change.

Finally, while our study does not prove in itself that a more comprehensive strategic agenda implies enhanced organisational performance, we are inclined to think this is likely to be the case. Recent studies on the informational effects of SPMSs have shown that their use is positively related to organisational performance. Although these studies were focused on SPMSs as tools for effective strategy implementation, we believe their findings make it plausible that the informational effects of the use of SPMSs on strategy (re)formulation will also relate positively to performance.

Our findings contribute to previous work in strategic management literature by translating, from a generic level right through to the level of specific management instruments, the well-established claim that strategy formulation and strategy implementation processes are intertwined. Our work also extends previous research on PMSs, in that our findings suggest that SPMSs not only have implications for the firm’s alignment with a pre-defined strategy or for implementation issues, as has often been assumed, but also influence some key attributes of the strategy formulation process.

Our study has relevant implications for top managers. Changes in a company’s external and internal contexts often require changes in its strategy. To make these changes, strategically relevant information must be accessible, and there need to be mechanisms — such as SPMSs — which can be used to gather, process and interpret this information for top management at both individual and team level, and translate it into action. We have provided evidence suggesting that SPMSs support strategy (re)formulation by increasing the ability of top management teams to develop more comprehensive strategic agendas than would be the case in organisations not using SPMSs. Therefore, when weighing the costs and the benefits associated with the design and use of an SPMS, one should consider that its implications extend beyond facilitating the effective implementation of the adopted strategy, to its active role in informing and shaping strategy-making.
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Appendix A. Sampling and measurement of variables
The unit of analysis of this study is the firm, which includes both independent companies with no subsidiaries and strategic business units within multi-business organisations as long as they have a legal personality of their own. Since our study is about formal strategy formulation processes carried out at top management levels, we used CEOs or senior managers as the key informants on behalf of the firm.

Following Dillmann’s guidelines,38 several procedures were employed in order to increase the likelihood both of the CEO actually receiving and personally replying and of a high response rate. A first round of questionnaires was sent out in June 2005 and 251 complete questionnaires were returned. A second round of follow-up questionnaires was set out again in September 2005 to non-respondents and 106 additional complete questionnaires were received. T-tests supported the absence of differences between early and late respondents and of any obvious non-response bias.

Regarding measurement of variables (see survey items in Appendix B), two of the four constitutive dimensions of SPMSs (DIMSPMS1 = the integration of long-term strategy and operational goals; and DIMSPMS2 = the presence of explicit causal relationships between goals and/or between performance measures) were measured using summated scales from multiple items with Likert scales drawn from prior literature.39 Measurement items for DIMSPMS1 were related to the links between long-term strategy and short-term performance goals, and the degree of the senior manager’s involvement in the design and selection of the performance measures. The items related to DIMSPMS2 referred to the inclusion of relationships between activities and between functional areas, the assistance offered to managers to understand these relationships, and the involvement of operating managers from different functional areas in the design and selection of the performance measures. The Cronbach’s a was higher than 0.9 for both dimensions, indicating high reliability. The constitutive dimension ‘sequence of goals/targets/action plans’ (DIMSPM3) was measured by a battery of four items in which respondents evaluated whether the performance measurement system in place explicitly contained a) goals, b) metrics, c) targets, and/or d) action plans. Finally, the dimension ‘provision of performance measures in the area of multiple perspectives’ (DIMSPMS4) was measured by the number of perspectives that the firm reported capturing out of an open list, with a suggested enumeration of examples of perspectives.

In order to measure frequency, respondents reported the number of times the firm had revised its strategy through formal strategy formulation processes in the last three years. Number and variety of decisions were made operational through an instrument which included an open list that enumerated more than 20 instances of potential strategic issues (e.g. opening of foreign markets, outsourcing, diversification or know-how development).40 The number of decisions was measured as the sum of reported occasions in which decisions regarding any strategic issue were made in the formal strategy formulation processes during the last three years. The variety of decisions was measured as the number of strategic issues that were the object of strategic decisions at least once in formal strategy formulation processes over that period.

Appendix B. Questionnaire items
• Is there a performance measurement system in place in your firm which is used at top management levels? (Yes/no)

Attached definition: Performance Measurement Systems (PMSs) = concise sets of metrics (financial and/or non-financial) that support the decision-making processes of an organisation by gathering,
During the last three years, how many times have decisions been taken regarding the following/C15

\[ \text{In the last three years, how many times have you engaged in revisions of your business strategy?} \]

\[ \text{18} \]

The Role of Performance Measurement Systems

References


9. In accordance with the recent literature on performance management (e.g. A. Neely, Business Performance Measurement. Cambridge University Press (2007)), in this study we reserve the term ‘performance measurement systems’ for systems that provide a concise overview of performance to guide decision-making. While selected metrics derived from financial statements may be and most often are included as indicators within PMSs, we consider financial statements as a category of management systems in their own right, and consequently they do not fall into the definition of PMSs as used here.

10. Several alternative labels (for example integrative strategic performance measurement systems, comprehensive performance measurement systems or simply performance measurement systems) have been proposed by different authors to refer to subsets of PMSs with similar features to the ones presented here; Features 1, 2 and 4 in our definition are consistent with the dimensions proposed by R. H. Chenhall, Integrative Strategic performance measurement systems, Strategic alignment of manufacturing, learning and Strategic outcomes: an exploratory study, Accounting. Organizations and Society 20, 395–422, (2005) which are also included in Garengo, et al. (2005). Feature 3 is derived from G. Speckbacher, J. Bischof and T. Pfeiffer, A descriptive analysis on the implementation of balanced scorecards in German-speaking countries, Management Accounting Research 14, 361–387 (2003).


32. It has been noted that in strategic planning processes, decision-makers do not focus on individual strategic issues in isolation. Instead, they spread their attention across the set of issues that constitutes the strategic issue array. Organisations vary in their issue array size (i.e. the number of issues considered at one time) and issue array variety (the diversity of issues considered at one time). (J.E. Dutton and R.B. Duncan, The influence of the strategic planning process on strategic change, Strategic Management Journal, 8, Mar–Apr, 103–116 (1987)). The concepts of strategic issue array size and variety have been adapted in this study to specifically refer to decisions taken in the strategy formulation process whose outcome is reflected in the strategic agenda. Since we aim to capture aspects of the resulting strategic agenda, we are interested here in the strategic decision array size and in the strategic decision array variety. Therefore, a strategy (re)formulation process with a small decision array size is one in which decision-makers only make a limited number of decisions on a limited number of strategic issues. On the other hand, a strategy (re)formulation process with a high decision array variety focuses attention and includes decisions on a broad, diverse range of strategic issues. For the sake of simplicity, in this article we refer to strategic decision array size as the ‘number of decisions’ and to strategic decision array variety as the ‘variety of decisions’.


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