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Publication date:
2012

Document Version
Publisher's PDF, also known as Version of record

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Pursuing Sustainability with the Balanced Scorecard:

Between Shareholder Value and Multiple Goal Optimisation

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June 2012

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ISBN 978-3-942638-20-3

ABSTRACT[1]

A rising awareness about the limitations of measuring organisational success merely with financial metrics has motivated researchers and practitioners to call for more holistic performance management and measurement systems. The balanced scorecard (BSC) as proposed by Kaplan and Norton is maybe the most popular framework which aims at a balance between multiple performance dimensions and objectives. Moreover, the increasing strategic importance of environmental and social aspects have led to the suggestion of a so called sustainability balanced scorecard (SBSC), which promises the consideration of even further performance dimensions. More specific, the SBSC aims at balancing financial objectives with environmental and social objectives. However, the SBSC approaches proposed strongly differ in the way they deal with managing multiple objectives. Against this background, we conduct a systematic review of the research field dealing with the SBSC in order to advance the knowledge on managing multiple corporate objectives. As part of our results, we first give a brief description of the research field using bibliographical analysis. Second, we derive a typology of generic SBSC architectures showing that the architecture is contingent on the value system the organisation chooses to operate in (profit driven, care driven, systemic driven) and the corporate sustainability strategy opted for (defence, accommodation, proaction). We further show that the architectures can generally be applied by various types of organisations (public listed, large private, and small and medium-sized companies), but that some combinations are more likely than others. Implications for management and research are also derived.

[1] We thank Roger Burritt for valuable feedback on an earlier version of the paper.

CONTENTS

LIST OF FIGURES

LIST OF TABLES

1. INTRODUCTION

Determining the nature of organisational success and managing performance accordingly is at the heart of corporate strategy (Cummings and Daellenbach 2009; Epstein and Roy 2001; Maltz et al. 2003). In this endeavour, it has often been called for a single-valued corporate objective. In line with this, management concepts focusing on financial success, such as the concept of shareholder value, have become popular (Jensen 2001; Rappaport 1986). This concept has the advantage of a simple performance structure and hence a straight forward management application.

However, these advantages go along with the cost of a limited view of the organisation's economic and social reality and the danger of financial overemphasis and, sometimes, short-termism. Taking these shortcomings into consideration, it is not surprising that financial crises both on a company level (e.g. financial breakdown of Enron, WorldCom) or on a broader economic level have been occurring now and then (Grant and Visconti 2006; Maltz et al. 2003).

Indeed, by narrowing organisational success to a single financial measure, companies may tend to overlook that financial performance is based on the achievement of non-financial objectives and related performance drivers such as employee morale, quality of products and processes, and the capacity to innovate (Eccles et al. 2006; Maltz et al. 2003). If companies fail to manage such drivers, organisations remain without control over the point of time, the direction, and the extent with which these drivers ultimately impact financial performance (in positive or negative ways).

Moreover, the management and measurement of non-financial issues and objectives have become increasingly important as ever more environmental and social issues receive attention through various stakeholder groups. Amongst others, consumers, pressure groups, insurance companies and investors increasingly demonstrate an environmentally and socially-oriented behaviour (Azzone and Bertelè 1994). Hence, organisations are expected to deal with issues such as resource depletion, environmental pollution, worker abuses in global supply chains, or global injustice (e.g. local food shortages due to fuel crops designated for export markets). For the last two decades, environmental and social issues have gained increasing strategic relevance for companies as they represent either risks (e.g. avoiding negative press coverage and consumer boycotts) or opportunities (e.g. positive effects on employee morale and corporate reputation; differentiation through eco products) (Aragón-Correa and Rubio-López 2007; Epstein and Roy 2001; Wehmeier 2006; Dias-Sardinha and Reijnders 2005; Schaltegger and Wagner 2006; Länsiluoto and Järvenpää 2010). In answer to these changes, proactive environmental or sustainability strategies are being developed by companies wanting to benefit from these changes (Azzone and Bertelè 1994; Aragón-Correa 1998; Aragón-Correa and

Rubio-López 2007).[2] The latter is most obvious in (but not limited to) industries with considerable exposure to environmental and social aspects (Azzone and Bertelè 1994).

In order to better address non-financial objectives and thus to overcome some of the above mentioned disadvantages of single-valued corporate objectives, multi-dimensional performance management tools have emerged (Maltz et al. 2003). The most popular one is the balanced scorecard (BSC) as proposed by Kaplan and Norton (Kaplan and Norton 1992, 1996).[3] The BSC aims at "balancing" financial and non-financial, short-term and long-term, as well as qualitative and quantitative success measures (Halachmi 2005; Möller and Schaltegger 2005). It does so by using a limited set of strategic objectives, which are distributed across four performance perspectives (financial, customer, internal processes, learning and growth) and ultimately linked towards financial success through cause-and-effect chains. Of course, such a management approach with multiple dimensions becomes more complex in that management is forced to deal explicitly with trade-offs between multiple objectives and find ways to link different goals with each other (Jensen 2001). However, the additional effort is promised to come at the benefit of a more encompassing view of organisational performance and performance management.

Nevertheless, despite these accomplishments by the BSC, researchers have recognised that environmental and social objectives have been largely neglected in the BSC. Despite its multiple performance perspectives, the BSC is in practice still mostly championed by the financial control department (Zingales et al. 2002).[4] Researchers have thus proposed alterations and extensions to the BSC with the aim to bring strategically relevant environmental and social goals into more explicit consideration, then also referred to as sustainability balanced scorecards (SBSC) (Figge et al. 2002a; Wagner 2007; Avlonas and Swannick 2009). Anecdotal and empirical evidence demonstrate that companies as diverse as Loyds TSB, Novartis, Axel Springer and Volkswagen have made first experiences with such SBSCs (Wagner 2007).

As the SBSC explicitly considers additional environmental and social objectives, it emphasises even more strongly the multi-dimensional character of performance management. But it does so in very different ways. Whereas some follow the conventional BSC architecture using a strict hierarchy that ultimately leads to financial success, other architectures deviate more radically from this through partly removing the hierarchy or even proposing network-like architectures (Figge et al. 2002a; van Marrewijk 2004).

[2] Aragón-Correa and Rubio-López also argue that proactive environmental strategies should be pursued even in the case no economic benefit can be derived (Aragón-Correa and Rubio-López 2007).

[3] The BSC has also been an important aspect in academic publications (van Veen Dirks and Wijn 2002; Ahn 2001). Though it should be noted that the BSC does not score the same number of publications compared to concepts such as scenario planning, cf. (Cummings and Daellenbach 2009).

[4] Jensen also states that the BSC in practice is in practice much stronger limited to financial measures than the multiple goal concept would suggest (Jensen 2001).

Considering the diversity of SBSC architectures and procedures, the aim of our research is to study these in more detail, in order to shed light on measuring and managing organisational success through multiple objectives. As of the knowledge of the authors, only limited reviews of the body of research exist to date (see for example: Figge et al. 2002a; van Marrewijk 2004; Hubbard 2009; Wagner 2007). We thus address our research aim with a systematic review of conceptual and empirical research from the last two decades. Based on this, we present a typology of generic SBSC architectures which are contingent on the corporate sustainability strategy and the organisation's value system.

The remainder of this paper is structured as follows: after this introduction, we describe more clearly what we consider to be a SBSC. Second, we describe the methodology of the systematic review as applied in the present paper. Third, we present the review results, including a brief bibliographical analysis of the research field and a thematic analysis leading to the SBSC typology mentioned above. Finally, the findings are discussed and end the paper with implications for management and research.

2. THE SUSTAINABILITY BALANCED SCORECARD

The BSC as originally proposed by Kaplan and Norton is intended as a strategic management tool for both operationalizing and measuring strategies on the level of business units (or even corporate level). Whilst extant literature mostly follows this understanding, some publications use the BSC in other contexts, for instance, to manage specific shared service units (e.g. HR or environmental departments), as a mere information system or more broadly as an analytical framework for both external sustainability benchmarking or meta reviews of literature.[5] In the present paper, we focus on the original understanding of the BSC as a strategic management tool.

In order for the BSC to become an SBSC, it is important to integrate sustainability into the BSC logic. Corporate sustainability has been defined as the triple bottom line (TBL), a notion suggesting that not only financial, but also the environmental and social bottom lines have to be considered (in the remainder of the paper we will speak more narrowly of environmental and social issues when the financial bottom line is not explicitly involved and refer to sustainability or the TBL in the other cases) (Epstein and Roy 2001; Dyllick and Hockerts 2002). Whilst the ideal and goal of sustainability is to advance all dimensions simultaneously (integrating all dimensions at the same time), in corporate practice, as discussed later, sustainability is often only advanced in selected aspects which are “most important” (i.e. strategic) for the company under consideration.

In summary, we consider the SBSC here to be a strategic performance management and measurement tool which explicitly incorporates sustainability-related strategic objectives designed for addressing divisional or corporate levels within for-profit organisations. This understanding of the SBSC is the basis for our systematic review, a methodology described more in detail in the following chapter.

[5] For the BSC as structuring framework see: Spiller 2000. The BSC for governments, non-profit organizations, or social business: Kaplan and Norton 2001; Somers 2005. The BSC as dedicated HR, environmental, or safety scorecards: Simmons 2008; Farber et al. 1995; Mohamed 2003. A BSC for board governance: Drew and Kaye 2007; Epstein and Roy 2004

3. METHOD

This paper is based on a *systematic* review, a methodology which differs from conventional reviews in the way that it aims at "synthesising research in a systematic, transparent, and reproducible manner" (Tranfield et al. 2003). Systematic reviews are important, not only for advancing an academic field, but also for informing management practice (Cumming and Daellenbach 2009). According to Tranfield et al., conducting a systematic review consists of five major steps: (1) identification of research, (2) selection of studies, (3) study quality assessment, (4) data extraction and monitoring process and (5) data synthesis and reporting (Tranfield et al. 2003). Each is explained further:

(1) *Identification of research*. In the first phase, keywords and search terms are identified. Based on our research question, we constructed a search string consisting of various terms related to sustainability, on the one hand, and to the BSC, on the other.[6] We applied the search string to titles and abstracts in major Internet-based research databases.[7] Only publications in English were considered. Based on abstract and titles, we identified a *preliminary* set of 189 journal articles.

(2) *Selection of studies*. Inclusion and exclusion criteria based on the SBSC definition given in the previous chapter are used to select the *core* articles for the review (Table 1). After applying these inclusion and exclusion criteria to abstracts and full texts, 43 and 24 journal articles remained, respectively. As not only journal articles should be considered in a systematic review, the references from the latter core journal articles were screened for potential non-journal sources meeting the above criteria, resulting in 11 additional publications (e.g. working papers) (Tranfield et al. 2003).

(3) *Study quality assessment*. As the field of research is only emerging, it was our aim to include as many articles as possible (both conceptual and empirical articles), thus, we did not further investigate the individual article's quality (e.g. based on methodological rigor). However, we eliminated journal articles from sources other than academic or well-known practitioner journals.

(4) *Data extraction*. All articles have been listed in a data-extraction form using basic information (authors, titles etc.) and specific information (details, method, etc.). The form served as both a log book for decisions within the process and a basis for subsequent data synthesis.

(5) *Data synthesis*. The synthesis was achieved on two levels: (1) a descriptive analysis of the field in the sense of a quantitative bibliographical analysis (how many articles, who are the authors etc.) and (2) an interpretative, *thematic analysis* for the identification and further analysis of key emerging themes in the context of our research question.

[6] Though adaptations were necessary to the circumstances of each database, the generic search string used is "(Sustainability OR Ecological OR Eco OR Environmental OR Green OR Greenish OR Greening OR Social OR Societal OR Community OR Stakeholder OR Ethics OR Ethical OR CSR OR Responsive) AND (Balanced scorecard OR Business scorecard OR BSC)".

[7] EBSCO, WILEY Online, JSTOR, Sciencedirect, Springer Link, and Inderscience.

Table 1. Inclusion and exclusion criteria for the SBSC systematic review

Criteria	Inclusion	Exclusion
Organisational types in which SBSC is applied	For profit enterprises	Non-profit companies (e.g. government organisations, NGOs, public hospitals/universities)
Nature of application	BSC used as strategic management and measurement tool	BSC as analytical framework for company benchmarking and meta reviews
Organisational level applied	Divisional or corporate SBSCs	Shared services/support units (e.g. environmental department) or board governance
Sustainability dimensions addressed	Environmental and/or social dimensions of sustainability need to be explicitly addressed in the SBSC architecture (e.g. by adding a sustainability perspective)	SBSCs where sustainability is only implicitly addressed or where sustainability-related objectives do not go beyond standard BSC objectives (e.g. employee satisfaction)

Based on the methodology above, the subsequent chapter presents the results.

4. RESULTS

The types of results presented are two-fold. First, a bibliographical analysis is used for a descriptive analysis of the SBSC research field. Second, we present the field's key emerging themes and, based on that, a thorough analysis of the various SBSC architectures.

4.1 Overall Publication Statistics

Our systematic review resulted in 36 research articles dealing with the SBSC (see Table 5 in the appendix.) About two thirds of the overall articles are journal publications (Table 2).

Looking at the geographical distribution of the authors' affiliation (Figure 1),it appeals that the SBSC is a phenomenon driven most strongly by European research institutions (including the UK). This is counter intuitive, as the early research has been strongly inspired by American publications on both the original BSC (Kaplan and Norton1996) and the SBSC (Epstein and Roy 2001).

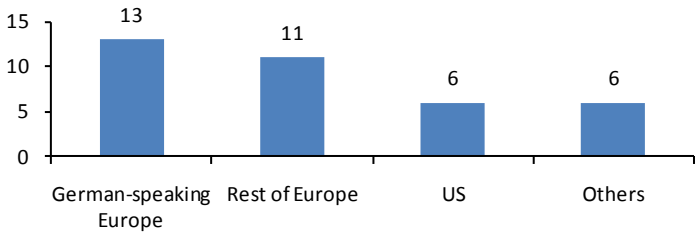

Figure 1. Geographical distribution of researchers (authors affiliation)

Whereas the SBSC was formerly published in (domain specific) sustainability journals and non-journal outlets, more recently, management journals have been the dominant outlet (Figure 2). This result may be a sign for that the goal of "mainstreaming", a desire often expressed in the sustainability discipline, is already being achieved (Smith and Lenssen 2009)

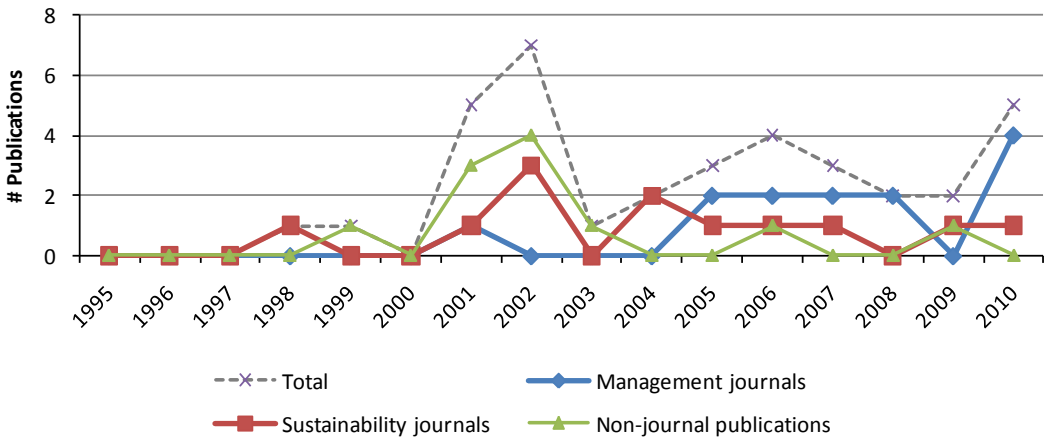

Figure 2. The SBSC in conventional management and sustainability journals

Table 2. The sample's list of journals (ordered by number of articles)

Journals	#Articles	Sub total
Management journals		*(13)*
Journal of Intellectual Capital	2	
Business Horizons	1	
CMA Management	1	
European Accounting Review	1	
European Financial Management	1	
Industrial Management & Data Systems	1	
International Journal of Accounting, Auditing and Performance	1	
International Journal of Productivity and Performance	1	
Journal of Accounting & Organizational Change	1	
Long Range Planning	1	
Qualitative Research in Accounting & Management	1	
The Journal for Decision Makers	1	
Sustainability journals		*(12)*
Business Strategy and the Environment	3	
Environmental Quality Management	3	
Journal of Business Ethics	2	
Business & Professional Ethics Journal	1	
Corporate Environmental Strategy	1	
Journal of Cleaner Production	1	
Journal of Industrial Ecology	1	
Other publications		*(11)*
Conference proceedings	7	
Working papers, study reports	3	
Book chapters	1	
Total		*36*

Research on the SBSC applies the full range of methods common in social sciences (Figure 3). Almost the same amount of conceptual and empirical articles (qualitative case studies, quantitative surveys) exist, with the most frequent method applied being case studies. In earlier phases conceptual articles prevail, whilst in recent years publications are almost always of empirical nature (Figure 4).

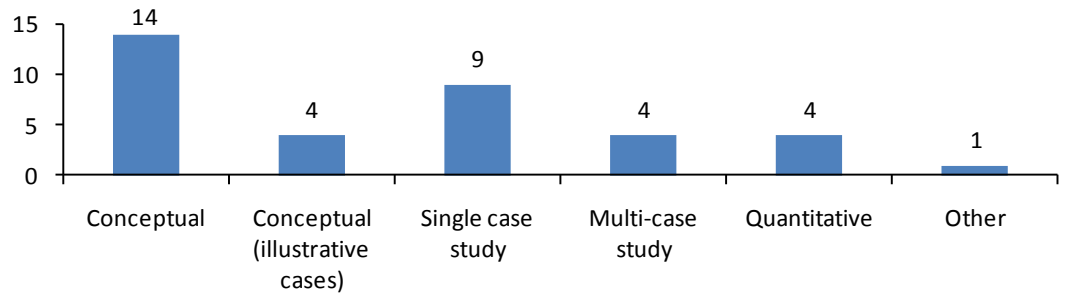

Figure 3. Methods used (cumulative)

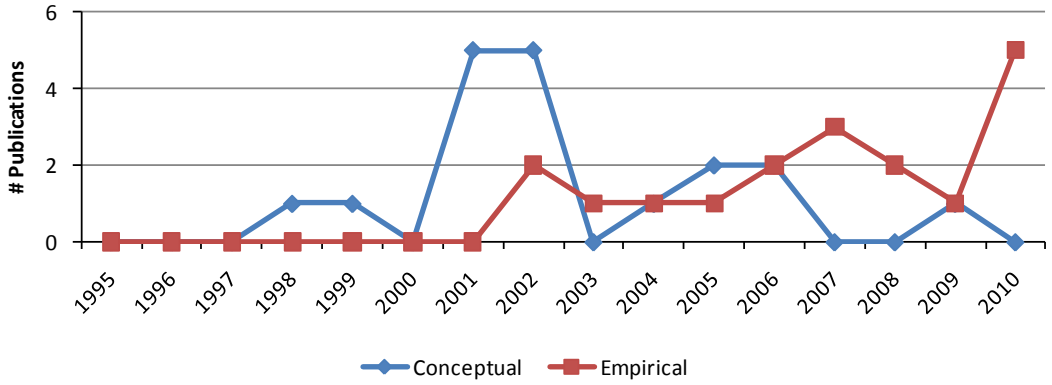

Figure 4. Conceptual vs. empirical articles (longitudinal)

Whilst space constraints detain us from elaborating it further, based on longitudinal analysis (cf. Figure 2 and Figure 4) we have identified three major epochs: 'pioneering' (1997-2001), characterised by mostly conceptual and non-journal articles, 'niche establishment' (2002-2006), with a diversity in methods used and publication outlets, and 'mainstreaming' (2007-2010), with almost only empirical articles in mainstream management journals.

4.2 Key emerging themes

We now turn to the second part of the data synthesis, namely the thematic analysis. As described in the method section, the aim of the thematic analysis was twofold: first, we broadly analysed the sample to give an overall impression of important topics dealt with in the field. These "key emerging themes" are presented in Table 3 and are intended to give a better understanding of the SBSC in the context of the overall organisation. The second part of the thematic analysis focuses on the SBSC architecture as one important theme; the results are presented in the following section.

Table 3. Key emerging themes in the context of the SBSC

Topic	Sub topic	Description
Intention/ type of use	-	Facilitation of strategy development, organisational change and strategy communication vs. performance management and measurement vs. mere information system
Architecture	Issues addressed	From overall sustainability to selected environmental (e.g. eco-efficiency) or social issues (e.g. philanthropy)
	Perspectives	Various modifications introduced: integration of environmental/social strategic objectives into conventional perspectives
		Reframing/broadening perspectives
		Adding dedicated environmental/social perspectives
	Hierarchy/ cause and effect chains	Rather conventional hierarchy (financial as ultimate goal) vs. multiple top-level perspectives or even network architecture
		Two camps: strict cause and effect chains vs. more liberal linkages or even systemic relationships
Performance indicators	Nature	Compilations of large lists of generic environmental/social indicators vs. empirically derived company-specific indicators
	Measurement peculiarities	Addressing impact-level indicators (e.g. socio-economic changes) sometimes requires extended measurement period (e.g. only every two years) and cooperation with external parties
Development process	Prerequisites	Building a SBSC from scratch vs. the assumption of the existence of a prior (conventional) BSC
	Steps	Overall, five important steps are considered:
		a) a comprehensive list of environmental and social aspects potentially being strategically relevant is composed
		b) all aspects are categorised into strategic core issues (i.e. lagging indicators), performance drivers (i.e. leading indicators), or hygienic factors (to remain unconsidered).
		c) Cause and effect-chains between performance drivers and strategic core issues are established
		d) the above results are visually summarised in a “strategy map”
		e) Based on performance drivers, concrete key performance indicators are developed; a yardstick is defined based on past performance/external benchmarking and specific improvement measures are defined
Cascading	Organisational units	BSC cascaded from corporate level (if existent) to divisions, to departments, and support functions
		Particular emphasis is given to the development of a BSC for the sustainability/environmental department and its interactions with higher level BSCs
	Individuals	Further cascading to individual managers/staff; link to individual performance appraisal possible
Links to other systems	Accounting/ information systems	So far possible, KPIs should be linked to or make use of data from (sustainability) accounting systems such as environmental management systems and HR systems
	Reporting	Though originally not meant as reporting system, taking an inward-out logic (in contrast to reporting based on international standards), some companies do report BSC results

4.3 SBSC architecture

In order to better understand the various possible SBSC architectures, we first present the environmental and social objectives actually addressed. Second, a (two-dimensional) typology to structure the various SBSC architectures is introduced. The third and fourth subsection is intended to further elaborate each of the two structuring dimensions.

Environmental and social objectives

Whereas the majority of publications focuses on integrating both environmental *and* social objectives into the conventional BSC and thus actually address sustainability (Figure 5), others are more focused on a single dimension (e.g. environment), the relationship between two dimensions (e.g. eco-efficiency) or even on a single issue (e.g. strategic philanthropy).

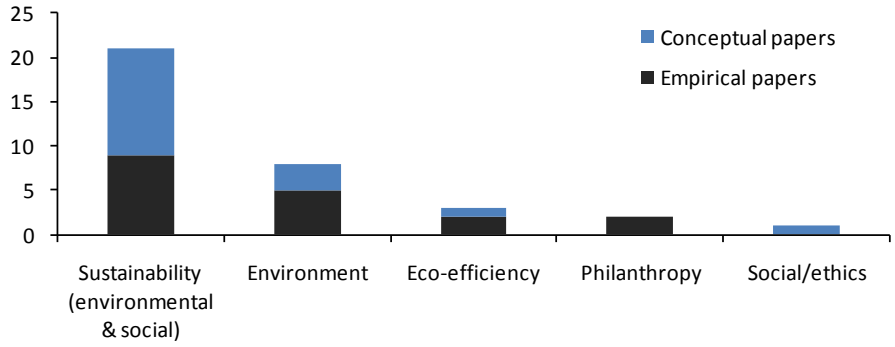

Figure 5. Issues focused

Introducing a typology of SBSC architectures

In order to integrate environmental and social objectives into the BSC, various modifications to its architecture are possible. Indeed, our sample offers a large variety of architectures, both with fewer or more substantial deviations from the original architecture. A first high-level finding from our sample is that BSC architectures can be structured according to two dimensions: the first dimension describes how BSC *perspectives* are modified based on the chosen *corporate sustainability strategy* and the second dimension relates to the modification of the BSC *hierarchy* according to the *value system* applied. Taking both dimensions together, a typology of *generic SBSC architectures* emerges (Figure 6; the frequencies with which articles from the sample match certain types of architecture are presented in Figure 7). We elaborate both dimensions more in detail in the following subsections using the architectural codes presented in Figure 6 as reference.

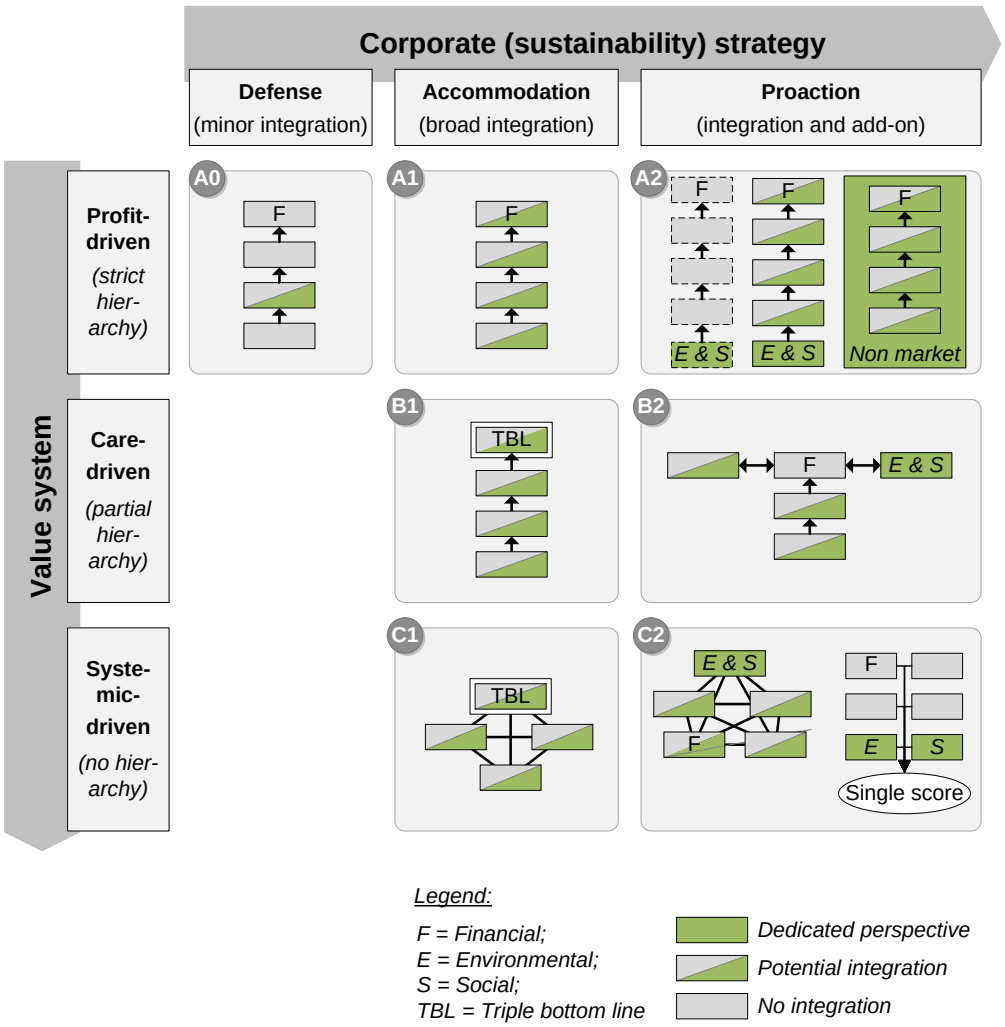

Figure 6. A typology of generic SBSCs architectures

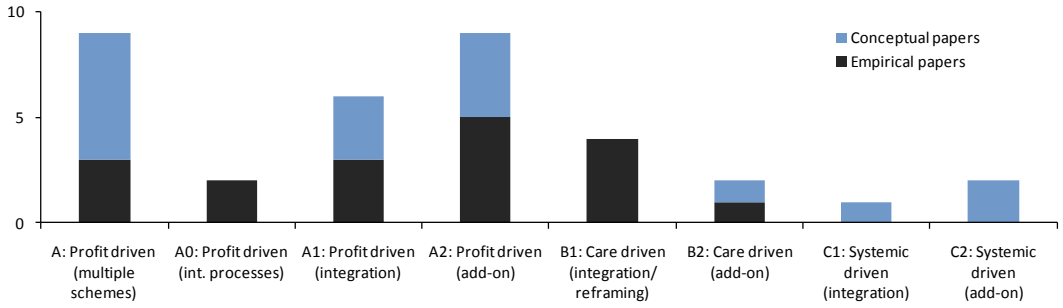

Figure 7. SBSC typology and frequencies

How corporate sustainability strategies determine SBSC perspectives (dimension 1)

Various taxonomies and typologies for sustainability strategies have been established representing a continuum ranging from defensive to proactive strategies, which are usually based on generic strategy frameworks suggested by Miles and colleagues, on the one hand, and classifications of social responsiveness behaviour by scholars such as Sethi, Wilson and Carroll on the other (Miles et al. 1978; Sethi 1975; Wilson 1975; Carroll 1979.).[8] Based on earlier work, Carroll proposes a continuum of social responsiveness with four categories of strategies: reaction, defence, accommodation and proaction. As the *reactive* strategy entirely neglects environmental and social issues, only the last three strategies (defence, accommodation and proaction) are considered useful for the present paper. This also matches later classifications of "proactive environmental strategies" which – based on empirical studies both in large companies and SMEs – merge the lowest two strategy types into one (Buysse and Verbeke 2003; Aragón-Correa et al. 2008; Aragón-Correa and Rubio-López 2007).

Our evidence shows that the higher the relevance of environmental and social issues within the strategy (i.e. the more advanced the sustainability strategy) is, the more extensive BSC modifications are conducted. This means that the various possible modes of *integration into* as well as *extension of* existing BSC perspectives are directly related to the degree to which environmental and social aspects have become ingrained into corporate (sustainability) strategy (Bieker et al. 2001).[9]

Thereby each subsequent strategy transcends the prior ones (i.e. strategies can benefit from architectural modifications inherent to prior strategies):[10]

- *Defence (limited integration).* In this first strategy, a rather cautious modification limited to the BSC's internal processes perspective is conducted. This includes the integration of environmental or social objectives such as environmental protection, energy efficiency, or occupational health and safety directly related to the production process (see architecture 'A0', Figure 6).
- *Accommodative (broad integration).* In more advanced approaches, environmental or social objectives are also integrated into the other conventional BSC perspectives. Whereas an efficiency orientation addresses cost-related aspects and thus relates more strongly to the financial perspective (e.g. adding an eco-efficiency objective), an innovative stance also addresses the customer perspective (e.g. product differentiation through environmental and social characteristics) as well as the learning and growth perspective (e.g. necessary sustainability-oriented innovation capabilities).

[8] Early advances in the context of environmental management are: Roome 1992; Azzone and Bertelè 1994. For a more detailed review of taxonomies and typologies see: Buysse and Verbeke 2003

[9] Bieker et al. have most clearly related their SBSC architectures to a strategy taxonomy with the categories reactive, efficient, innovative, and progressive (Bieker et al. 2001).

[10] The earlier papers on the BSC in the context of sustainability already conceptualize that there are three major ways of integrating sustainability objectives into the BSC, namely, the integration into the internal process perspective, the integration into the larger set of perspectives, or the creation of new perspective (Bieker et al. 2001; Epstein and Wisner 2001a).

Whereas the labels of the perspectives are usually maintained, sometimes integration comes along with reframing the perspective in the sense of using broader labels. For example, the most prominent reframing (24% of total publications) is done by broadening the customer perspective to include other stakeholders as well (another frequent modification, the expansion from a financial to a triple bottom line perspective, is not considered as reframing here, because it has wider implications to the hierarchy of the SBSC, as will be explained later).

- *Proactive (integration and add-on perspective).* Kaplan and Norton have already emphasised that the conventional four BSC perspectives do not necessarily have to be the only ones (Kaplan and Norton 1996). Beyond the modes of integration presented above, a further possibility is to add a perspective dedicated to environmental and social objectives. A dedicated perspective is said to emphasise the importance of environmental and social objectives as – in addition to the integration in other perspectives – these objectives can also exist in their own right (architecture 'A2'). Usually this is a single "environmental/social" perspective, but sometimes two separate perspectives are created. Sometimes a "non-market" perspective is created *embedding* the four conventional perspectives – then strictly restricted to environmental and social objectives which cannot be integrated into the other four perspectives. It should be noted that we understand a proactive strategy in a narrow sense if both *add-on* and *integration* is pursued simultaneously. Still, there are also cases where the add-on perspective is created *instead* of an integration of objectives in other perspectives (in 20% of the articles). As this bears the risk of a "parallel organisation" where environmental and social objectives are not linked to conventional management, we have indicated this architecture with dashed lines (Schaltegger and Wagner 2006).

Whilst the typology of architectures gives a fair overall impression about the distribution of the sample according to the *generic* architectures (cf. Figure 6), it does not show which of the individual SBSC perspectives were *actually* targeted for integrating environmental and social objectives. The following chart (Figure 8) addresses these shortcomings by showing descriptive statistics about which specific modifications were taken in the sample of articles (consider that not all articles can be clearly allocated, as some offer "multiple schemes").

Changing the BSC architecture is not limited to the modification of individual perspectives, but can also go a step further by modifying its hierarchy, as dealt with next.

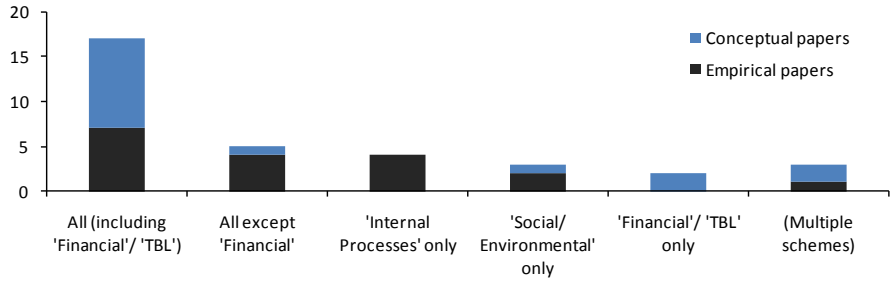

Figure 8. Target perspectives for integrating environmental/social objectives

How the value system determines the SBSC hierarchy (dimension 2)

A significant share of articles analysed suggest that the SBSC architectures also vary with regard to their hierarchy. Van Marrewijk suggests that the organisation's "value system" determines the nature of the hierarchy. He distinguishes three major systems "profit-driven", "community-driven", and "systemic-driven" representing stages on a path from strictly hierarchical to rather systemic relationships between objectives (van Marrewijk 2004. See also: van de Woerd and van den Brink 2004).[11]

- *Profit-driven (conventional/strict hierarchy).* In the profit-driven value system, the conventional hierarchy is maintained and changes to the BSC are limited to modifications of perspectives and strategic objectives as described in the prior chapter (architectures 'A0'-'A2'). Advocates of this "camp" stress the need for a top-down arrangement of perspectives with accurate linkage of strategic core issues and performance drivers ultimately contributing to financial objectives. They consider the strict hierarchy as necessary for making environmental and social aspects become fully ingrained into general management as well as to prevent the SBSC from being perceived as a public relations exercise (Figge et al. 2002a; Zingales et al. 2002).
- *Care-driven (partial hierarchy).* Another "camp" criticises cause-and-effect linkages because causal relationships are "not always linear and one-way, but are commonly a fuzzy mess of interactions and interdependencies" (Brignall 2002). These advocates also state that companies aiming at higher ambition levels of sustainability, particularly when sustainability becomes part of the product-market mix, are overly constrained by the strict hierarchical architecture (van de Woerd and van den Brink 2004). Proponents of the care-driven value system thus suggest a *semi-hierarchical architecture*, where the top financial perspective is replaced either by a broader triple bottom line perspective (i.e. a sustainability perspective; see architecture 'B1') or by multiple top-level perspectives (e.g. a separate social/ environmental perspective next to the financial perspective; see architecture 'B2'). Still as this group of researchers is much smaller than the one supporting a profit-driven value system, such radical changes of the BSC are comparatively rare (cf. Figure 7). Some may also argue that there is not a considerable

[11] We did not address the primary stage "compliance" here, as a conventional BSC already goes beyond that. For a systematic comparison of comparable taxonomies or stage models of corporate sustainability see: Maon et al. 2010

difference between the architectures from the care-driven and the profit-driven value system, as the latter *also* allows integrating environmental and social objectives into the financial perspective. However, in the profit-driven value system, environmental and social objectives considered for the financial perspective must be efficiency-related (either eco-efficiency or socio efficiency) as they are required to contribute to financial objectives directly (or via a clearly defined cause-and-effect chain). In contrast, the care-driven value system (with a triple bottom line perspective or multiple perspectives on the top), allows to pursue environmental and social objectives in their own right, this is, to also allow trade-offs to be made other than to the benefit of financial value maximisation. It is thus a "new governance structure" with "shareholder value being balanced with the interests of other legitimate stakeholders" (van Marrewijk 2004).

- *Systemic-driven (no hierarchy/network).* Ultimately, the systemic-driven value system is the basis for an even more radical change, the *replacement of the BSC's hierarchy* with a network structure where all perspectives are linked to each other (or where no relations are defined at all). It is noteworthy that this rather radical network structure has remained a conceptual phenomenon so far (no related empirical papers exist in the sample).

SBSC architectures and type of organisation

In order to get a more practical understanding of the various value systems and related SBSC architectures, we also looked at the type of organisation which were analysed in the empirical studies (see column "type of organisation" in Table 5 in the appendix). This reveals that three groups of organisations can be distinguished: publicly listed companies, (large) private companies, and small and medium-sized enterprises (SMEs). According the definition of the European Commission we consider SMEs to have a maximum of 250 employees.[12] It is interesting that for architectures on both levels, profit driven and care driven, all three types of organizations are represented (as mentioned earlier, no empirical study of the systemic-driven value system belongs to the sample). Public listed companies (in comparison with other types of organisation) are relatively more often operating in the profit-driven value system, which can be expected due to the strong shareholder pressure.

Beyond this big picture, we further analysed the sample's in-depth case studies in order to reveal more details about the actual companies and their characteristics (Table **4**).

[12] The European definition for small and medium-sized enterprises is the following: less than 250 employees and less than 50 Million EUR turnover, accordingly large enterprises have more than 250 employees (European Commission 2003).

Table 4. BSC architecture and type of business organisation (indices in brackets link to publications in Table 5)[a]

Value system	**Types of business organisation and related case study companies**		
(BSC architecture)	Public listed companies *(investor controlled)*	Large private companies[b] *(privately controlled)*	Small and medium-sized companies[b] *(family or owner-manager controlled)*
Profit driven	Tata steel (P20); Food plc[1] (P21, P22)	Hamburg Airport[2] (P27); Energyco[3] (P30)	Fresh Breeze[1] (P28); Merck Ltd., Thailand[5] (P15, P16)
Care driven	EDP Produção (P8) Sonãe (P8)	Coop Adriatica[4] (P31); Granarolo[4] (P31)	Ceramic Ltd.[1,6] (P23)

After the overview given above, our aim is to investigate what type of organisation engages with more radical SBSC architectures as it is the case in the care-driven value system.

- It is interesting that also public listed companies seem to be compatible with a care-driven value system. EDP Produção, for example, a Portuguese utility – the largest company listed at the Portuguese stock exchange – maybe represents this best. The company has ambiguous goals for radically changing the energy portfolio to 70% renewable energy (through including large hydro plants) and has already achieved intermediate results on this way (EDP Produção 2011).[13] With this strategy, it seems that EDP Produção makes sustainability an integrated part of their business model and thus overcomes some of the trade-offs inherent to other utilities only superficially engaging in sustainability (whilst trying to protect their coal and nuclear-based business models). This leading posture towards sustainability may also stem from the company's history as a state-owned company.
- The examples of large private companies, Coop Adriatica and Granarolo (a subsidiary of Granlatte) are also interesting cases. Both companies are co-operatives. This type of organisation is less strongly pressured by

[a] Companies listed stem only from publications using a case study research strategy (illustrative cases were omitted for lack of detail; large-scale survey results could not be integrated as only aggregated data on the BSC is available which does not allow for determining the exact BSC architecture)
[b] We relate to the definition by the European Union, where small and medium-sized enterprises are defined as having less than 250 employees (and an annual turnover of less than EUR 50 Million) (European Commission 2003).
[1] Fictitious name due to reasons of anonymity
[2] Partly state-owned (minority)
[3] Fully state owned
[4] Co-operatives
[5] Subsidiary of the publicly listed stock corporation Merck Darmstadt, Germany (with shares partial family owned)
[6] Family-owned business (with a hired general manager – i.e. not owner managed)
[13] EDP Produção (2011). Annual Report 2010. Lisbon, Portugal. Retrieved from http://www.edp.pt (accessed 15.07.2011).

shareholder value considerations and thus seems to be more flexible for radical changes of the objective function.[14]

- Last but not least, Ceramic Ltd. shows that care-driven value systems are also used in SMEs. The ceramic printing company is a family-owned business – thus it may be the values of the family which facility a care-driven posture (Wagner 2010).

Overall, the results presented show that the SBSC architectures differ according to the corporate sustainability strategy chosen and the value system operated in. All types of organisations (public listed companies, large private enterprises, SMEs) can apply this range of architectures, while it seems that special forms of organisations (e.g. co-operatives, family businesses) are more likely to go beyond the profit-driven value system and related architectures.

[14] The legal form of cooperatives with their advantages for sustainability and corporate responsibility have been widely discussed (e.g.: Pirson and Turnbull 2011; Antal and Sobczak 2004)

5. DISCUSSION

Four aspects are worth to be discussed further. First, we reflect on the generic SBSC architectures in the light of the critique about multiple goals. Then we discuss the necessity of a single-valued objective function. In the final two sections, we derive implications for management and research.

5.1 Generic SBSC architectures, values system and the multiple goals critique

The SBSC drives the idea of multiple goals inherent to the original BSC even further. This could be a challenge in the light of the critique which the BSC approach has received. Jensen (2001), for example, states that

> *"a decision maker cannot make rational choices without some overall single dimensional objective to be maximised. Given a dozen or two dozen measures and no sense of the tradeoffs between them, the typical manager will be unable to behave purposely, and the result will be confusion"*

In practice, however, this seems to be only a minor problem, as in the conventional hierarchical architectures based on the profit-driven value system all strategic goals need to contribute to financial outcomes directly. It is this hierarchy which broadly clarifies that trade-offs need to be taken to the benefit of financial performance (Zingales et al. 2002). This behaviour is fully understandable given the economic risks at hand, which are real and should not be underestimated. As Kaplan and Norton have stated, even in cases where considerable improvements in non-financial performance dimensions (say in internal processes) were achieved, disregarding financial objectives may leave such improvements without the necessary translation into financial success. Neglecting the financial performance perspective can thus easily lead to value destroying activities and can jeopardise organisational survival (Jensen 2001; Azzone and Bertelè 1994). It is probably for this reason that most companies described in our sample, particularly stock corporations, choose hierarchical SBSC architectures based on a profit-driven value system (cf. Table 5 in the appendix). However, following a *hierarchical* SBSC architecture in the above sense bears its own risk. The narrow focus on ultimate financial success, through which sustainability is practically marginalised to environmental and social aspects which contribute to (short-term) financial success (e.g. by increasing eco-efficiency), may blind companies from initiating the necessary radical change processes – changes necessary for competing in future markets likely characterised by low carbon economy, more conscious customers and increasing transparency (Azzone and Bertelè 1994; Eccles et al. 2006). For example, a car manufacturer able to address eco-efficiency in its production processes or vehicle fleet may improve both legitimacy and profits in the short term. Still, this does not facilitate the same firm to think about more environmental-friendly business models such as car sharing (or even ride sharing), which may play a more important role in future markets as the

latest new ventures created by BMW ("DriveNow") and Daimler Benz ("Car2Go") indicate (Mont 2004).[15] Such strategic endeavours, as opposed to operational optimisations, require long term investments without the ultimate guarantee of success. Even though Kaplan and Norton's original conception of the BSC's learning and growth perspective was intended to provide space for exactly such long-term change processes, it may actually be impossible, or at least very difficult, to realise this potential as of the trade-offs implicitly or explicitly given through the hierarchical orientation towards the financial bottom line. We thus hypothesise in reference to the seminal works of Christensen and colleagues, that it is this rigidity of conventional performance management tools (including the strictly hierarchical BSC) that firms often fail to respond to disruptive environmental changes except that they create new ventures independent from the established and dominant (but declining) business units and performance trajectories (Christensen 1997; Christensen and Bower 1996).

In contrast, the semi-hierarchical SBSC architectures from the *care-driven* value system, by making the financial performance dimension compete with other performance dimensions, could be a building block for so called ambidextrous organisations, which are characterised by the capability to simultaneously manage incremental (short-term) and radical (long-term) change processes within the same organisation (Tushman and O'Reilly 1996; Raisch et al. 2009). This may also relate to what others have argued to be the importance of incorporating a "future dimension" into performance measurement systems (Maltz et al. 2003). In our sample, co-operatives play an important role in this SBSC architecture. Beyond food (retail) sectors, co-operatives from other sectors have also been increasingly successful and use the SBSC for managing multiple objectives, as the UK-based Co-operative Bank shows. The company was involved in research on the SBSC and today reports to use a SBSC with "competitive advantage", "commercial success", and "social goals" as top-level objectives (SIGMA 2003; Co-operative Group 2009).

Going even further, in the *systemic-driven* value system, where hierarchy is replaced by a network character, managing organisational performance seems to become a real challenge for corporations. Assuring to make profits within a large set of equally important objectives seems to be beyond the current capacity of many companies is what the absence of corresponding *empirical* papers in the sample may imply. The systemic architecture might be more comfortable for organisations where balancing financial with other objectives is part of the game, such as for social businesses and non-profit organisations (which have not been investigated in this paper).[16] Recent research however shows that there is interest in adapting the BSC to social business organisations (Somers 2005).

[15] Information about BMW's DriveNow is available online at: https://www.drive-now.com/ (12.09.2011) and Daimler's Car2Go at http://www.car2go-hamburg.de/ (12.09.2011). See also: Firnkorn and Müller 2011

[16] Though not in the focus of this paper, dedicated BSC architectures for social business and non-profits have been developed earlier - initially by Kaplan and Norton themselves but also by others (Kaplan and Norton 2005).

5.2 Trade-offs and the single-valued objective function

In his critique on multiple corporate objectives, Jensen suggested that an "*overall* objective function" would be necessary to explicitly specify how trade-offs between multiple objectives should be made. We do agree to some extent, but we do not necessarily expect that all trade-offs need to be specified in all details in the SBSC architecture. Such thinking would be based on a rather idealistic (or technocratic) understanding, where it is expected to perfectly control all organisational parts and individuals by the SBSC's architecture. Advocates of this group not only require that the SBSC is cascaded down from the corporate level to individual units and functions, but also directly translated into goal setting and performance appraisal of individual managers (or even staff) (Joseph 2008). It is however questionable that this reflects a realistic understanding of organisational complexities, which often requires ambidexterity rather than conformity amongst its organisational units (Tushman and O'Reilly 1996). Extreme monetary incentive systems furthermore can cause crowding-out effects, where intrinsic motivation of managers and staff is reduced with the result of less overall economic performance (Pfeffer 1998). We think that in most cases the SBSC represents rather the overall strategy and gives guidance for the strategic measures to be taken for a first implementation step, whilst the very details should be decided in a decentralised manner and should be further customised through instruments such as individual goal setting and performance appraisal. Specifically for trade-offs between financial objectives on the one hand and environmental or social objectives on the other, it is our belief that managerial discretion is to be taken and entrepreneurial creativity to be applied to find new solutions on a case-by-case basis (whilst, of course, remaining in the context of the overall strategy given by the SBSC). A mechanistic, formula-like definition of trade-offs, as the notion of a corporate objective function implies, may not lead to the best results and impede creative solutions.

This latter understanding must not underplay the disadvantages and risks related to the use of multiple objectives which the SBSC even more strongly relies on compared to its original version. In the absence of a rigorous hierarchy, SBSC architectures in the care-driven value system put high demands on performance management. Particularly using the triple bottom line as an integrated top-level performance perspective gives, architecture-wise, very few guidance on how to deal with the multiple objectives within this integrated perspective. This inherits the risk of opportunistic de-coupling between the formal SBSC architecture and actual implementation. De-coupling in this context means that multiple objectives (particularly environmental and social ones) are only superficially established and communicated for reasons of internal and external legitimacy, rather than being substantially considered in real-life actions (Meyer and Rowan 1977; DiMaggio and Powell 1983). To prevent such, it is necessary to develop and maintain a corporate culture which guarantees that educated and responsible managers handle trade-offs in adequate ways (Wilson et al. 2006).

Some may still prefer a rather explicit specification of trade-offs in the sense of a single-valued objective function. In this case, one of the architectures identified in our sample could possibly inform such endeavour (see Figure 6, architecture 'C2') (Hubbard 2009). There, an aggregation mechanism is "plugged on" to the SBSC to allow for an aggregation of the performance perspectives (and indicators included therein) into a single score by using weighing mechanisms. Whilst this mechanism stems from an article proposing the systemic-driven value system where weighing is straight forward (i.e. all performance perspectives are considered to have similar weight), the mechanism can also be applied in any other generic SBSC architecture by using modified weighing factors (Epstein and Wisner 2001a).

5.3 Implications for management

The typology of generic SBSC architectures gives clear guidance for managers wanting to make environmental and social objectives an integral part of their way of doing business and, more specific, how to integrate it into the company's performance management and measurement framework. First, managers need to make a judgement about the *general relation* between profit-making and sustainability, which is represented by the *value system* and hence by a profit-driven, care-driven or even systemic-driven understanding of multiple objectives.
Second, and based on the latter, managers should engage in a process of strategy formulation in which they need to decide on the *specific* relevance they want to give to sustainability within their corporate strategy, of which the output is a defensive, accommodative or proactive *corporate sustainability strategy*. Both dimensions, the value system and the corporate sustainability strategy, then lead to one of the generic SBSC architectures. This in turn serves as a basis for developing company-specific strategy maps with specific strategic goals and corresponding performance indicators.

5.4 Limitations and implications for research

Our findings show that most empirical studies belong to the profit-driven value system. Further research, particularly empirical studies, could identify and investigate case studies in companies following a care-driven or systemic-driven value system in order to better understand drivers, barriers and mechanisms of managing multiple objectives in a semi-hierarchical or even non-hierarchical way.
By the design of our study, we have limited the systematic review to articles dealing with SBSCs on the top-level of organisations (division or even corporate level). We have thus not analysed the process of how the top-level strategy is translated (or even cascaded) to lower hierarchical units. We have also excluded "scorecards" dedicated only to managing environmental or sustainability support units (often referred to as "environmental scorecard") (Figge et al. 2002a). However, research indicates that using scorecards in these support units could help to demonstrate the

benefits of proactive sustainability strategies and thus increases the likelihood for an integration into higher level BSC systems (Zingales et al. 2002). Further research should investigate this relationship more in detail.

Overall, we consider the SBSC to be a promising framework for integrating strategy and sustainability. We expect that the systematic review presented in this paper supports its clarification and understanding so to inspire further advancement in research and broader application in practice.

Table 5. List of articles considered for the systematic review

Id	Author(s)	Year	Publication type	Method	Type of organisation	Issues addressed	BSC type*
P01	Anand, Sahay & Saha	2005	Journal article	Quantitative	PLC	Sustainability	A
P02	Bieker & Waxenberger	2002	Conference proceedings	Conceptual	-	Sustainability	C2 (l)
P03	Bieker, Dyllick, Gminder & Hockerts	2001	Conference proceedings	Conceptual	-	Sustainability	A
P04	Brignall	2002	Conference proceedings	Conceptual	-	Sustainability	A
P05	Claver-Cortés, López-Gamero, Molina-Azorín & Zaragoza-Sáez	2007	Journal article	Multi case study	PLC	Environment	A1
P06	Crawford & Todd	2005	Journal article	Illustrative cases	(PLC)	Sustainability	A1
P07	Dias-Sardinha, Reijnders & Antunes	2002	Journal article	Quantitative	SME	Environment	B1
P08		2007	Journal article	Multi case study	PLC	Environment	B1
P09	Epstein & Wisner	2001	Report	Illustrative cases	(PLC)	Sustainability	A
P10		2001	Journal article	Illustrative cases	(PLC)	Sustainability	A
P11	Figge, Hahn, Schaltegger & Wagner	2001	Conference proceedings	Conceptual	-	Sustainability	A2 (r)
P12		2002	Journal article	Conceptual	-	Sustainability	A2 (r)
P13		2002	Conference proceedings	Illustrative case	LE	Sustainability	A2 (r)
P14	Gardiner	2002	Journal article	Conceptual	-	Social/ethics	-
P15	Hansen, Sextl & Reichwald	2009	Conference proceedings	Case study	SME (subsidiary of PLC)	Philanthropy	A2 (r)
P16		2010	Journal article	Case study	SME (subsidiary of PLC)	Philanthropy	A2 (r)
P17	Hubbard	2009	Journal article	Conceptual	-	Sustainability	C2 (r)
P18	Jensen	2001	Journal article	Conceptual	-	Stakeholders	-
P19	Johnson	1998	Journal article	Conceptual	-	Environment	A1
P20	Joseph	2008	Journal article	Case study	PLC	Sustainability	A0
P21	Länsiluoto & Järvenpää	2008	Journal article	Case study	PLC [1]	Eco-efficiency	A1
P22		2010	Journal article	Case study	PLC [1]	Eco-efficiency	A0
P23	León-Soriano, Muñoz-Torres & Chalmeta-Rosaleñ	2010	Journal article	Case study	SME	Sustainability	B1
P24	Möller & Schaltegger	2005	Journal article	Conceptual	-	Eco-efficiency	A2 (r)
P25	Radcliffe	1999	Conference proceedings	Conceptual	-	Environment	A1
P26	Scavone	2006	Journal article	Conceptual	-	Environment	A
P27	Schaltegger & Wagner	2006	Journal article	Case study	SME	Sustainability	A2 (r)
P28	Schneider & Vieira	2010	Journal article	Case study	SME	Sustainability	A2 (m)
P29	SIGMA	2003	Study report	Other[2]		Sustainability	B1
P30	Sundin, Granlund & Brown	2010	Journal Article	Case study	LE (state owned)	Sustainability	A1
P31	van der Woerd & van den Brink	2004	Journal article	Multi case study	LEs and SMEs	Sustainability	B2
P32	van Marrewijk	2004	Journal article	Conceptual	-	Sustainability	B2
P33	Voelpel, Leibold & Eckhoff	2006	Journal article	Conceptual	-	Sustainability	C1
P34	Wagner	2007	Journal article	Quantitative	LEs and SMEs	Environment	A
P35	Wagner & Schaltegger	2006	Book chapter	Quantitative	LEs and SMEs	Environment	A2 (r)
P36	Zingales, Rourke & Hockerts	2002	Working paper	Multi case study	PLC	Sustainability	A

PLC=Publicly listed company; LE=Large (private) enterprise; SME = Small and medium-sized enterprise;
* Codes relate to framework of BSC architectures in figure 6; l=left; m=middle; r=right;
[1]Case study in the main subsidiary in the country of the Group's headquarters;
[2]According to the project's website, it is most probably a qualitative and action research study, however, method is not explicitly stated in the article.

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