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Firm performance – from how to measure to how to manage. An overview

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Abstract: *The term 'performance' and the two main concepts, performance measurement and performance management, have evolved, becoming an important topic for both academics and practitioners. As a result, the literature in the past decades has grown exponentially, containing various definitions, frameworks and models. The purpose of this paper is to exhibit the evolution of 'performance' determined by the major breakthroughs, the models and frameworks created, which one is the most common and used in practice and if innovation, social and environmental concerns could lead to the design and implementation of a new performance framework.*

Key-words: *performance measurement, performance management, model, framework, sustainability.*

1. Introduction

When we refer to the concept of 'performance', there are a variety of terms that try to properly define and cover the key aspects (Dimon, 2013).

Michael and Philippa Bourne (2012) claim that in a very simple way, good performance can be seen as achieving the objectives, but this is not enough, you should know as an organization how to achieve those objectives without being successful on short-term jeopardizing the success of the company for long-term. This means that it is important to know the nature of good performance and, before measuring and benchmarking performance, the organization should determine what success is for its particular business.

Performance measurement has started to increase in popularity, both in research and practice since Johnson and Kaplan (1987) published their seminal book, Relevance Lost – The Rise and Fall of Management Accounting. A few years later, Neely (1999) supported the idea of an increasing interest in performance measurement, by identifying over 3.600 articles between 1994 and 1996, when he introduced the phrase "performance measurement revolution".

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The paper is organized as follows. In the next part, I will review the literature in order to exhibit the evolution of performance and the factors that have contributed to the development of concepts such as performance measurement and performance management, the design and implementation of various frameworks and models.

Other distinct parts of the paper are focused on presenting the increased importance of financial reporting, the differences between CSR and sustainability that led performance from how to measure to how to manage and to the development of a model that includes this concerns. The results, discussions and conclusions are presented in the last part of the paper.

2. Objectives

The main objective of this paper is to present the evolution from a simple concept, to a major concern for academics, practitioners and pundits, resulting in a plethora of studies, models, frameworks, fuelled by the dynamics of social, economic, political and technological environment.

Another objective is to emphasize the influence of factors like sustainability, financial, non-financial indicators, CSR etc. on performance and the development of a framework that contains all of the above.

3. Literature review

According to Bititci et al. (2012), performance measurement and performance management practices can be found today in all sectors of industry and commerce, including the public sector. In the 21st century, the world is changing both in business and natural sense and issues such as environmental and social problems, global warming become concerns for individuals, small and multinational businesses, public servants and politicians.

These concerns are influenced by technological development, globalization effects, removed trade barriers and the changes in how organizations are managed (Bititci et al. 2012).

Richard et al. (2009) claim that previous research has shown a multidimensional conceptualization of organizational performance with limited effectiveness of commonly accepted measurement practices. Franco-Santos et al. (2007) suggest that business performance management (BPM) over the past 20 years has been studied using different perspectives, summarized in 3 main research streams:

a. operations perspectives
b. strategic control perspective
c. management account perspective

Performance management and the management field have a long history, which emerged, in the opinion of most researchers, in the 13th century, the origins of performance measurement underlying in the double entry bookkeeping that remained unchanged until the Industrial Revolution (Bititci; 2015). Starting with the Industrial Revolution, several events have had an important impact on how management has been developed and perceived today, as shown in Table 1 (Bititci; 2015).

Industrial Age	❖ Ford's mass-manufacturing system led to labour specialization (Taylor, 1911; Ford, 1922); ❖ the move from the piece-work system to the wage system (Johnson, 1981); ❖ the emergence of multiple plants, increased organizational and managerial complexity (Chandler, 1977, Bourne, 2001); ❖ the emerge of divisional and departmental budgets (Chandler, 1977, Bourne, 2001); ❖ the above developments were paralleled in government institutions (Williams, 2002, 2003, 2004).
Early stages of globalization, '50s	❖ led to more sophisticated approaches to productivity management: quality control, variety reduction etc. (Schonberger, 1982; Suzaki, 1987); ❖ focus on productivity improvements many times at the expense of customers', employees' (stakeholders') satisfaction (Schonberger, 1982; Suzaki, 1987); ❖ emphasis on financial indicators (Kaplan, 1983; Johnson and Kaplan, 1987; Keegan et al. 1989; Neely et al. 1995).
Time between '60s and '80s	❖ the economic engine moved from demand to supply and the performance measurement got new dimensions focused on customers: e.g. customer satisfaction (Hayes and Abernathy, 1980; Slack, 1983; Kaplan, 1984); ❖ performance management was recognized as a multi-dimensional domain (Skinner, 1974; Hayes and Abernathy, 1980; Goldratt and Cox, 1986; Keegan et al., 1989; Dixon et al., 1990; Kaplan et al., 1992; Neely et al., 1995); ❖ led to the development of more integrated and balanced approaches to performance management (Johnson and Kaplan, 1987).

Table 1. *The evolution of performance measurement and of the management field*

At that time (between '60s and '80s), the performance measurement literature mainly focused on whether the strategy is being implemented as planned and whether the results are those intended (Steiner, 1969; Schendel and Hofer, 1979; Wheelen and Hunger, 1983; Glueck and Jauch, 1984; Hax and Majluf, 1984; Schreyögg and Steinmann, 1987) and, in particular, whether short-term performance

indicators linked to the achievement of long-term performance should be developed as strategic controls (Horovitz, 1979; Goold and Quinn, 1990; Simons, 2008).

Due to the fact that the focus was on what to measure and how those measures reach the strategic alignments, different performance measurement models and frameworks were developed in order to align the performance measures with the business strategy (DuPont Corporation, 1920s; Cross and Lynch, 1988; Keegan et al., 1989; Dixon et al., 1990; Fitzgerald et al., 1991; Kaplan and Norton, 1992, 1996, 2001; Flamholtz, 1995; Neely et al., 1996; Atkinson and Waterhouse, 1997; Bititci et al., 1997; EFQM, 1999; Bourne et al., 2000; Neely and Adams, 2002; McAdam and Bailie, 2002; Rouse and Putterill, 2003; Hagel III et al., 2009; Thomas and McElroy 2015), but the most popular are the models below:

- ***A.*** *The Du Pont Model, ROI and RONA Ratios (started to be developed in the 1920s);*
- ***B.*** *The Strategic Measurement Analysis and Reporting Technique (SMART), a.k.a The Performance Pyramid (1988);*
- ***C.*** *The Performance Measurement Matrix (1989);*
- ***D.*** *The Performance Measurement Questionnaire (1990);*
- ***E.*** *The Results and Determinants Framework (1991);*
- ***F.*** *The Balanced Scorecard (1992 onwards);*
- ***G.*** *The Pyramid of Organizational Development (1995);*
- ***H.*** *The Cambridge Performance Measurement Design Process (1996);*
- ***I.*** *The Integrated Performance Measurement System Reference Model (1997);*
- ***J.*** *The Business Excellence Model of the European Foundation for Quality Management (1999);*
- ***K.*** *The Performance Prism (2002);*
- ***L.*** *The Integral Framework for Performance Measurement (2003);*
- ***M.****The Shift Index (2009);*
- ***N.*** *The MultiCapital Scorecard (2015).*

As a result, numerous authors asked one fundamental question: "How should performance measures be used to manage the performance of the organization?" (Meekings, 1995; Neely et al., 2000; Bourne et al., 2000).

This thought ended up with the development of the concept of Performance Management as a process – where performance measures enable the management of the organizations' performance (Lebas, 1995; Bititci et al., 1997; Waggoner et al., 1999; Bourne and Neely, 2000; Marchand et al., 2000; Neely et al., 2000; Haag et al., 2002; Adair et al., 2003; Kennerley and Neely, 2003; Nudurupati and Bititci, 2005).

This research brought up factors such as: system maturity, organizational structure, size and culture, management style, information and communication systems, being key factors that have an impact on the success or failure of performance measurement (Langfield-Smith, 1997; Otley, 1999; Reid and Smith,

2000; Hoque and James, 2000; Chenhall, 2003; Franco and Bourne, 2003; Garengo and Bititci, 2007; Simons, 2013).

While the research in performance measurement became richer and richer, several fields were developed or started to grow in parallel adding new perspectives to performance management:

a) HR started to be aligned with the organizational performance measurement systems (Meyer et al., 1995; Kaplan and Norton, 1996; Ittner and Larcker, 1998; Scott and Tiessen, 1999; Lawler, 2003; Sanchez and Heene, 2004; Corona, 2009; Dutta, 2009; Bacal, 2011), with Huselids (1995) groundbreaking study, who exhibited that a set of HR practices, named "high performance work systems" (HPWSs) were related to turnover, accounting profits and firm market value. New perspectives on performance management were created, such as: teaming measures and managerial measures (Çiçek et. al., 2005; Mendibil and MacBryde, 2005; Van Vijfeijken et. al, 2006);
b) The quality management field started to extensively use performance measurement in order to improve performance processes and the organizations, with approaches such as Six Sigma and Lean Enterprise (Hines and Rich, 1997; Lynch et al., 2003; Swinehart and Smith, 2005; Banuelas et al., 2006; Greiling, 2006; Baker et al., 2007; Kanji and Sá, 2007; Purbey et al., 2007);
c) innovation management started explore how to measure and manage the performance of innovation and R&D activities and processes (Adams et. al., 2006; Chiesa and Frattini, 2007; Chiesa et al., 2009);
d) the influence of environmental and social considerations were added on the use and design of performance measurement systems, from strategic to operational and supply chain perspectives (Xie and Hayase, 2006; Molina-Azorín et al., 2009; Wood, 2010), by integrating corporate social responsibility, environmental management and green supply chain practices all around the organization's performance measurement systems (Ditz and Ranganathan, 1997; Elkington, 1997; Epstein and Roy, 1998; Andersen and Fagerhaug, 1999; Sarkis, 2003; Hervani et al., 2005; Liu and He, 2005; Xie and Hayase, 2006; Tsai and Hung, 2009).

3.1. Is performance accurately reflected in financial reports?

According to Sacer et al. (2016), financial statements are used to show the financial position and the business performance of a company and, as a consequence, they have become a source for the decision-making process; the elements from the financial statement should be measured by using international or national accounting standards. They claim that based on what evaluation method is used, the elements from the financial reports are more or less a subject of estimates (Sacer et al., 2016).

Having in mind the fact that making estimates means a certain degree of subjectivity, different estimates on the same element are the result of different

accounting information, and the financial information and performance of a company will also be different (Sacer et al., 2016).

The same idea is supported by Sherman and Young (2016), who claim that financial statements depend on estimates and judgment, and due to the increasing impact of innovative companies from the emerging markets, these metrics are not the most accurate in comparing the firms or showing how well a company is performing. They also point out the issue that rises from using financial indicators, which is that of inaccurate metrics provided by the two main accounting standards, IFRS and GAAP (Sherman and Young; 2016). There are cases of companies where, when applying both standards, different results were obtained. This is a big issue for an investor and can put a merger or an acquisition in danger and can have an impact on the company's market value (Sherman and Young; 2016).

The International Accounting Standards Board (IASB; 2015), as the International Financial Reporting Standards' setter, confirms that "to a large extent, financial reports are based on judgement and models rather than being exact depictions".

The auditors are an important piece from this puzzle, and it is a challenge for them to establish the fair value of the companies, even when they have to work with companies and assets that can be measured. But the real challenge is how to evaluate intangible assets, goodwill, patents, projects from R&D department (Sherman and Young; 2016).

Accounting estimates have become a major issue for the accounting profession, a fact that is confirmed by the audit companies which have adverse inspections concerning the estimation methods applied by companies (KPMG, 2015).

3.2. Sustainability and the impact on performance indicators

The concept of sustainable development was introduced in 1987 by the Brundtland Commission and since then, governments, companies, national and international organizations have adopted sustainability. Veleva et al. (2003) claim that, by embracing sustainability and its issues, companies can cope with the global competitive markets and the challenges they face.

In some researchers' opinion, traditional CSR (Corporate Social Responsibility) programs do not qualify as sustainability measures (Whelan and Fink; 2016). Including sustainability in the company strategy can provide business opportunities and increase profits; this statement is supported by a growing number of evidence and example of companies which benefit from adopting sustainable measures (Whelan and Fink; 2016).

In order to be able to measure and evaluate the progress related to sustainability, researchers, practitioners and companies started developing and using

sustainability tools and indicators (Veleva and Ellenbecker, 2001; Veleva et al., 2003; Searcy, 2012; Goyal, Rahman and Kazmi, 2013).

According to Neely et al. (2005) "performance indicators are the metric used to quantify the efficiency and/or effectiveness of actions of part or of an entire process or a system in relation to a pattern or target".

To have a better understanding and to improve performance, managers started to recognize and incorporate sustainability indicators (Epstein and Roy, 2001). The companies realized that by using sustainable indicators, they could improve their imagine or bring a competitive advantage and, as a result, companies around the world responded to sustainable development by changing their business activities in product development (Pujari et al., 2003; Aragón-Correa et al. 2003).

For planning and strategic control cycles, performance indicators are vital elements (Neely et al., 1997) and The Balanced Scorecard is one of the best known and applied PMS which translates strategic objectives into actions and performance indicators (Kaplan and Norton, 1995). The Balanced Scorecard does not explicitly address the environmental variables, but it is used as a tool in order to manage social and environmental issues, claim different authors (Epstein and Roy, 2001; Figge et al., 2002; Möller and Schaltegger, 2005; Hubbard, 2009).

Since the Brundtland Report (1987) defined the concept of sustainable development as being the "development that meets the needs of the present without comprising the ability of future generations to meet their needs" (Beheiry et al., 2006; Arena et al., 2013), the interest of introducing the features of sustainability in the Performance Measurement System has increased, thanks to the strategic integration of non-financial indicators for organizations (Kaplan and Norton, 1995).

Therefore, the Triple Bottom Line (TBL) came out as the concept of sustainability, as the integration of economic, social and environmental dimensions (Elkington, 1997). The Triple Bottom Line, beside the economic indicators of performance typically used in most companies for performance, attached social and environmental indicators of performance (Nappi and Rozenfeld; 2015).

In this regard, the Global Reporting Initiative (GRI) works towards a sustainable global economy, providing the sustainability reporting guidelines in the Triple Bottom Line dimensions (Samuel et al., 2013). Bos-Brouwers (2010) claim that GRI's sustainability reporting tool is the most widely used tool although it is for voluntary use; its performance indicators listed there are used to measure and report the economic, social and environmental performance (Global Reporting Initiative, 2011).

According to a research in McKinsey's volume, "sustainability programs are not only strongly correlated with good financial performance, but also play a role in creating it" (Bonini and Swartz; 2014). In order to be successful in the sustainability program, companies should: set priorities, identify the proper metrics in the value chain, aim at long-term sustainability; set strong goals and have the concept of circular economy in mind (Bonini and Swartz; 2014). Beside the direct impact on

financial performance, companies will benefit from improved reputation, perception of customers, better business relationships with stakeholders.

3.3. Multi-Capital scorecard

Thomas and McElroy (2015) claim that there is an explicit need for measuring sustainability performance in literal terms and in a company-specific context, due to the fact that corporate reporting standards treat climate change discretionarily and most companies do not provide disclosures in this regard.

Same authors suggest that a step ahead is the implementation of a performance accounting system (a.k.a. multicapitalism), which measures economic, social and environmental impacts in an integrated way, focusing on the impacts of "vital capitals" – natural capital for the environment; and human, social and other capitals for social and economic impacts (Thomas and McElroy, 2015).

Gleeson-White (2014), argues in her book that multiple capital accounting is becoming a mainstream. Also, in a report entitled "Raising the Bar – Advancing Environmental Disclosure in Sustainability Reporting", the United Nations Environmental Programme (UNEP, 2015) recommended the following:

- ✓ "All companies should apply a context-based approach to sustainability reporting"
- ✓ "Reporting standards/guidance bodies such as GRI, IIRC, SASB, CDP etc. should integrate Sustainability Context more explicitly into their frameworks, for example by applying the concept of carrying capacities to multiple capital-based frameworks."

Thomas and McElroy (2015) developed a MultiCapital Scorecard (MCS), suggesting that there is a need for structured, context and capital-based methodology that organizations can use to measure, manage, and report their performance. A scorecard that would be on the one hand, a truly Triple Bottom Line measurement and reporting system, and on the other hand, it would work as an open source innovation and public good that can be adapted. This type of scorecard should evaluate performance relative to the organization's specific circumstances and not just in general terms.

They also provide a sample report of the MultiCapital Scorecard, which has shown success with three U.S. pilots: Ben & Jerry's; New Chapter, Inc., a subsidiary of Procter & Gamble; and Agri-Mark, Inc. (aka, Cabot Creamery Cooperative), a large dairy food producer in New England, in Figure 1 (Thomas and McElroy, 2015).

● Human ● Internal financial
● Social & relationship ● External financial
● Constructed ● Non-financial
● Natural

BOTTOM LINE	AREAS OF IMPACT	Progression score (A)	Weight (B)	Weighted score (A×B=C)	Fully sustainable score (B×3=D)	Gap to fully sustainable (D−C)	Area of impact bottom line (C÷D)	TRIPLE BOTTOM LINE
SOCIAL	● Living wage	1	1	1	3	2	33%	-25%
	●●● Workplace safety	-1	5	-5	15	20	-33%	
	●●● Innovative capacity	-1	2	-2	6	8	-33%	
ECONOMIC	● Equity	2	5	10	15	5	67%	62%
	● Borrowings	2	1	2	3	1	67%	
	●● Competitive practices	1	1	1	3	2	33%	
ENVIRON-MENTAL	● Water supplies	3	3	9	9	0	100%	53%
	● Solid wastes	1	2	2	6	4	33%	
	● The climate system	1	5	5	15	10	33%	
	OVERALL PERFORMANCE			**23**	**75**	**52**		**31%**

NOTE AREAS OF IMPACT SHOWN ARE PURELY ILLUSTRATIVE AND ARE ALWAYS ORGANIZATION-SPECIFIC. WITH THE EXCEPTION OF "NATURAL," THEY USUALLY INCLUDE INTELLECTUAL CAPITAL.
SOURCE THOMAS & MCELROY LLC

Fig. 1. *Sample MultiCapital Scorecard (Thomas and McElroy, 2015)*

Thomas and McElroy (2015) claim that multiple capital accounting, by using the MultiCapital Scorecard, represents a crucial evolution in performance measurement and reporting that must be generally adopted around the world if the aspirations of COP21 are to become reality.

4. Results and discussions

The literature is rich when it comes to performance measurement having various approaches. According to Neely et al. (2002), the performance management systems enable support of the decision-making process by gathering, elaborating and analysing information. Marchand and Raymond (2008) see performance measurement as a system for information integration, useful for the implementation

of objectives in organizations and combined inside. Other authors claim that performance measurement is the main management tool for decision making, control and ensuring useful information for effective resource allocation (Parker, 2000; Kuwaiti, 2004).

As a tool for performance improvement and strategic planning, performance measurement is analysed by Gunawan et al. (2008). Tucker and Pitt (2009) opine that performance measurement helps the process of value creation and in evaluating and changing performance goals.

Also, concerning CSR, Carroll (1999) claims that this is an evolving concept, Wilson (2003) opines that corporate sustainability is a corporate management paradigm by which companies integrate social, environmental and economic concerns into their strategy and decision (García-Benau, Sierra-Garcia and Zorio, 2013). While Souto (2009) said that CSR is considered a tool used to provide confidence to stakeholders as the organization is perceived responsible and reliable.

Financial and non-financial measures are used in the analysis of PMS and CSR. Arena and Arnaboldi (2014) suggest that we must distinguish between financial and non-financial indicators and between leading and lagging indicators. Accounting indicators are considered the "core" foundation of performance reporting (Speziale and Kloviene, 2014). Non-financial indicators can detect weak signals from both external and internal processes (Arena and Arnaboldi, 2014). Financial and non-financial measures where developed, for example the Balanced Sorecard (Kaplan and Norton, 1992), the Value Based Costing (Gupta and Gunasekaran, 2005) and other different models (De Toni and Tonchia, 2001; Taticchi, Tonelli and Cagnazzo, 2010; Nudurupati et al. 2011; Franco-Santos, Lucianetti and Bourne, 2012; Choong, 2013).

5. Conclusion

In the study, I have approached the evolution of performance, from performance measurement to performance management, the design of various models and frameworks, presenting current trends and a model that incorporates them, called MultiCapital Scorecard. The findings support the idea that performance is a major concern for both the public and the private sector, with a huge interest for both academics and practitioners. Since the environment becomes more complex, new variables are added to the context, so the models and frameworks should take into consideration the concerns such as sustainability, innovation, intangible assets, non-financial indicators etc.

6.References

Adair, C.E., Simpson, L., Birdsell, J.M., Omelchuk, K., Casebeer, A.L., Gardiner, H.P., Newman, S., Beckie, A., Clelland, S., Hayden, K.A. and Beausejour, P., 2003. *Performance measurement systems in health and mental health services: Models, practices and effectiveness. A State of the Science Review*. Alberta Heritage Foundation for Medical Research.

Adams, R., Bessant, J. and Phelps, R., 2006. Innovation management measurement: A review. *International Journal of Management Reviews*, 8(1), pp.21-47.

Andersen, B. and Fagerhaug, T., 1999. "Green" performance measurement. *International Journal of Business Performance Management*, 1(2), pp.171-185.

Aragón-Correa, J.A. and Sharma, S., 2003. A contingent resource-based view of proactive corporate environmental strategy. *Academy of management review*, 28(1), pp.71-88.

Arena, M. and Arnaboldi, M., 2014. *R*isk and performance management: are they easy partners?. *Management Research Review*, 37(2), pp.152-166.

Arena, M., Azzone, G. and Conte, A., 2013. A streamlined LCA framework to support early decision making in vehicle development. *Journal of Cleaner Production*, 41, pp.105-113.

Atkinson, A.A., Waterhouse, J.H. and Wells, R.B., 1997. A stakeholder approach to strategic performance measurement. *Sloan management review*, 38(3), p.25.

Bacal, R., 2011. *Performance Management 2/E*. McGraw Hill Professional.

Baker, S.L., Beitsch, L., Landrum, L.B. and Head, R., 2007. *The role of performance management and quality improvement in a national voluntary public health accreditation system*. Journal of Public Health Management and Practice, 13(4), pp.427-429.

Banuelas, R., Tennant, C., Tuersley, I. and Tang, S., 2006. *Selection of Six Sigma projects in the UK*. The TQM Magazine, 18(5), pp.514-527.

Beheiry, S.M., Chong, W.K. and Haas, C.T., 2006. *Examining the business impact of owner commitment to sustainability*. Journal of Construction Engineering and Management, 132(4), pp.384-392.

Bititci, U., Garengo, P., Dörfler, V. and Nudurupati, S., 2012. *Performance measurement: challenges for tomorrow*. International Journal of Management Reviews, 14(3), pp.305-327.

Bititci, U.S., 2015. *Managing business performance: The science and the art*. John Wiley & Sons.

Bititci, U.S., Carrie, A.S. and McDevitt, L., 1997. *Integrated performance measurement systems: a development guide*. International journal of operations & production management, 17(5), pp.522-534.

Bonini, S. and Swartz, S., 2014. *Profits with purpose: How organizing for sustainability can benefit the bottom line*. McKinsey on Sustainability & Resource Productivity.

Bos-Brouwers, H.E.J., 2010. *Corporate sustainability and innovation in SMEs: evidence of themes and activities in practice*. Business Strategy and the Environment, 19(7), pp.417-435.

Bourne, M. and Bourne, P., 2012. *Handbook of corporate performance management*. John Wiley & Sons.

Bourne, M. and Neely, A., 2000. *Why performance measurement interventions succeed and fail*. In Proceedings of the 2nd International Conference on Performance Measurement, Cambridge UK (pp. 165-73).

Bourne, M., 2001. *The handbook of performance measurement*. London: Gee Publishing.

Bourne, M., Mills, J., Wilcox, M., Neely, A. and Platts, K., 2000. *Designing, implementing and updating performance measurement systems*. International journal of operations & production management, 20(7), pp.754-771.

Brundtland, G., 1987. *Our Common Future*. UN Brundtland Commission Report.

Carroll, A.B., 1999. *Corporate social responsibility: Evolution of a definitional construct*. Business & society, 38(3), pp.268-295.

Chandler, A.D., 1977. *The visible hand*. Harvard University Press, Cambridge Mass., USA.

Chenhall, R.H., 2003. Management control systems design within its organizational context: findings from contingency-based research and directions for the future. *Accounting, organizations and society*, 28(2), pp.127-168.

Chiesa, V. and Frattini, F., 2007. *Exploring the differences in performance measurement between research and development: evidence from a multiple case study*. R&D Management, 37(4), pp.283-301.

Chiesa, V., Frattini, F., Lazzarotti, V. and Manzini, R., 2009. *Performance measurement in R&D: exploring the interplay between measurement objectives, dimensions of performance and contextual factors*. R&D Management, 39(5), pp.487-519.

Choong, K., 2013. *Understanding the features of performance measurement system: a literature review*. Measuring Business Excellence, 17(4), pp.102-121.

Çiçek, M.C., Köksal, G. and Özdemirel, N.E., 2005. *A team performance measurement model for continuous improvement*. Total Quality Management and Business Excellence, 16(3), pp.331-349.

Corona, C., 2009. *Dynamic performance measurement with intangible assets.* Review of Accounting Studies, 14(2-3), pp.314-348.

Cross, K.F. and Lynch, R.L., 1988. *The "SMART" way to define and sustain success*. Global Business and Organizational Excellence, 8(1), pp.23-33.

De Toni, A. and Tonchia, S., 2001. *Performance measurement systems-models, characteristics and measures*. International Journal of Operations & Production Management, 21(1/2), pp.46-71.

Dimon, R., 2013. *Enterprise Performance Management Done Right: an operating system for your organization*. John Wiley & Sons.

Ditz, D.W., World Resources Institute (Washington) and Ranganathan, J., 1997. *Measuring up toward a common framework for tracking corporate environmental performance*. World Resources Institute.

Dixon, J.R., Nanni, A.J. and Vollmann, T.E., 1990. *The new performance challenge: measuring operations for world class competition*. Irwin Homewood, IL: McGraw-Hill.

DuPont Corporation, 1920s. The Du Pont Model, ROI and RONA Ratios.

Dutta, S., 2009. *Discussion of "Dynamic performance measurement with intangible assets"*. Review of Accounting Studies, 14(2-3), pp.349-357.

EFQM, 1999. *Self-assessment guidelines for companies*. Brussels: European Foundation for Quality Management.

Elkington, J., 1997. *Cannibals with forks: The triple bottom line of 21st century business*. Oxford: Capstone.

Epstein, M. and Roy, M.J., 1998. Managing corporate environmental performance: A multinational perspective. *European Management Journal*, 16(3), pp.284-296.

Epstein, M.J. and Roy, M.J., 2001. Sustainability in action: Identifying and measuring the key performance drivers. *Long range planning*, 34(5), pp.585-604.

Figge, F., Hahn, T., Schaltegger, S. and Wagner, M., 2002. *The sustainability balanced scorecard–linking sustainability management to business strategy*. Business strategy and the Environment, 11(5), pp.269-284.

Fitzgerald, L., Brignall, T.J., Johnston, R. and Silvestro, R., 1991. *Performance measurement in service businesses*. Management Accounting, 69(10), p.34.

Flamholtz, E., 1995. Managing organizational transitions: implications for corporate and human resource management. *European Management Journal*, 13(1), pp.39-51.

Ford, H., 1922. *My life and work*. Garden City, NY: Doubleday, Page and Company.

Franco, M. and Bourne, M., 2003. Factors that play a role in "managing through measures". *Management Decision*, 41(8), pp.698-710.

Franco-Santos, M., Kennerley, M., Micheli, P., Martinez, V., Mason, S., Marr, B., Gray, D. and Neely, A., 2007. *Towards a definition of a business performance measurement system*. International Journal of Operations & Production Management, 27(8), pp.784-801.

Franco-Santos, M., Lucianetti, L. and Bourne, M., 2012. Contemporary performance measurement systems: A review of their consequences and a framework for research. *Management accounting research*, 23(2), pp.79-119.

García-Benau, A.M., Sierra-Garcia, L. and Zorio, A., 2013. *Financial crisis impact on sustainability reporting*. Management decision, 51(7), pp.1528-1542.

Garengo, P. and Bititci, U., 2007. *Towards a contingency approach to performance measurement: an empirical study in Scottish SMEs*. International Journal of Operations & Production Management, 27(8), pp.802-825.

Gleeson-White, J., 2014. *Six Capitals: The revolution capitalism has to have--or can accountants save the planet?*. Allen & Unwin.

Glueck, W. F., & Jauch, L., 1984. *Business policy and strategic management (4th ed.)*. New York: McGraw-Hill.

Goldratt, E.M. and Cox, J., 1986. *The goal: A process of ongoing improvement*. New York, NY: North River Press.

Goold, M. and Quinn, J.J., 1990. *The paradox of strategic controls*. Strategic Management Journal, 11(1), pp.43-57.

Goold, M., 1991. *Strategic control in the decentralised firm*. Sloan Management Review, 32, pp. 69-81.

Goyal, P., Rahman, Z. and Kazmi, A.A., 2013. Corporate sustainability performance and firm performance research: Literature review and future research agenda. *Management Decision*, 51(2), pp.361-379.

Greiling, D., 2006. Performance measurement: a remedy for increasing the efficiency of public services?. *International Journal of Productivity and Performance Management*, 55(6), pp.448-465.

Global Reporting Initiative (GRI), 2011. *Sustainability Reporting Guidelines V 3.1*. Global Reporting Initiative, Amsterdam, The Netherlands, [Online], Available: <https://www.globalreporting.org/resourcelibrary/G3.1-Guidelines-Incl-Technical-Protocol.pdf> [Accessed 21st March 2017].

Gunawan, G., Ellis-Chadwick, F. and King, M., 2008. *An empirical study of the uptake of performance measurement by Internet retailers*. Internet Research, 18(4), pp.361-381.

Gupta, K.M. and Gunasekaran, A., 2005. Costing in new enterprise environment: A challenge for managerial accounting researchers and practitioners. *Managerial Auditing Journal*, 20(4), pp.337-353.

Haag, S., Cummings, M. and McCubbrey, D.J., 2002. *Management information systems for the information age*. New York, NY: McGraw-Hill.

Hagel III, J., Brown, J.S. and Davison, L., 2009. *The shift index: uncovering the emerging logic of deep change*. Deloitte Center for the Edge, pp.1-15.

Hax, A.C. and Majluf, N.S., 1984. *Strategic management: an integrative perspective*.

Hayes, R.H. and Abernathy, W.J., 1980. Managing our way to economic decline. *Harvard Business Review*, 58, pp. 67-77.

Hervani, A.A., Helms, M.M. and Sarkis, J., 2005. *Performance measurement for green supply chain management*. Benchmarking: An international journal, 12(4), pp.330-353.

Hines, P. and Rich, N., 1997. The seven value stream mapping tools. I*nternational journal of operations & production management*, 17(1), pp.46-64.

Hoque, Z. and James, W., 2000. Linking balanced scorecard measures to size and market factors: impact on organizational performance. *Journal of management accounting research*, 12(1), pp.1-17.

Horovitz, J.H., 1979. *Strategic control: a new task for top management*. Long Range Planning, 12(3), pp.2-7.

Hubbard, G., 2009. *Measuring organizational performance: beyond the triple bottom line*. Business strategy and the environment, 18(3), pp.177-191.

Huselid, M.A., 1995. *The impact of human resource management practices on turnover, productivity, and corporate financial performance*. Academy of management journal, 38(3), pp.635-672.

IASB, 2015. *The Conceptual Framework for Financial Reporting*. Exposure Draft ED/2015/3. IFRS Foundation, [online] Available at: <http://www.ifrs.org/Current-Projects/IASB-Projects/Conceptual-Framework/Documents/May%202015/ED_CF_MAY%202015.pdf> [Accessed 15 March 2017].

Ittner, C.D. and Larcker, D.F., 1998. *Innovations in performance measurement: Trends and research implications*. Journal of management accounting research, 10, p.205.

Johnson, H.T., 1981. Towards an understanding of 19th century cost accounting. *The Accounting Review*, 56, pp. 510-518.

Johnson H.T. and Kaplan, R.S., 1987. *Relevance lost: the rise and fall of management accounting*. Harvard Business School Press, Cambridge, MA.

Kanji, G. and Moura E Sá, P., 2007. Performance measurement and business excellence: The reinforcing link for the public sector. *Total Quality Management & Business Excellence*, 18(1-2), pp.49-56.

Kaplan, R.S. and Norton, D.P., 1992. The Balanced Scorecard – Measures that drive performance. *Harvard Business Review*, 70, pp. 71-79.

Kaplan, R.S. and Norton, D.P., 1995. *Putting the balanced scorecard to work. Performance measurement, management, and appraisal sourcebook*, 66, p.17511.

Kaplan, R.S. and Norton, D.P., 1996. *The balanced scorecard: translating strategy into action*. Harvard Business Press.

Kaplan, R.S. and Norton, D.P., 2001. *The strategy-focused organization: How balanced scorecard companies thrive in the new business environment*. Harvard Business Press.

Kaplan, R.S., 1983. *Measuring manufacturing performance: a new challenge for managerial accounting research*. In Readings in accounting for management control (pp. 284-306). Springer US.

Kaplan, R.S., 1984. *The evolution of management accounting*. In Readings in accounting for management control (pp. 586-621). Springer US.

Keegan, D.P., Eiler, R.G. and Jones, C.R., 1989. Are your performance measures obsolete?. *Strategic Finance*, 70(12), p.45.

Kennerley, M. and Neely, A., 2003. Measuring performance in a changing business environment. *International Journal of Operations & Production Management*, 23(2), pp.213-229.

KPMG, 2015. *Getting Accounting Judgements and Estimates "Right"*, [online] Available at: <https://boardleadership. kpmg.us/ content/dam/ blc/pdfs/ 2014/accounting-judgments-estimates-board-perspectives.pdf> [Accessed 04 Aprilie 2017].

Kuwaiti, M.E., 2004. Performance measurement process: definition and ownership. *International Journal of Operations & Production Management*, 24(1), pp.55-78.

Langfield-Smith, K., 1997. *Management control systems and strategy: a critical review*. Accounting, organizations and society, 22(2), pp.207-232.

Lawler, E.E., 2003. *Reward practices and performance management system effectiveness*. Organizational Dynamics, 32(4), pp.396-404.

Lebas, M.J., 1995. *Performance measurement and performance management*. International journal of production economics, 41(1-3), pp.23-35.

Liu, Y. and He, M., 2005. *Design of "green grade" rating system for the environmental performance assessment of a firm*. International Journal of Management and Enterprise Development, 2(2), pp.183-203.

Lynch, D.P., Bertolino, S. and Cloutier, E., 2003. *How to scope DMAIC projects*. Quality progress, 36(1), pp.37-41.

Marchand, D.A., Davenport, T.H. and Dickson, T., 2000. *Mastering information management*. Financial Times Prentice Hall.

Marchand, M. and Raymond, L., 2008. *Researching performance measurement systems: An information systems perspective*. International Journal of Operations & Production Management, 28(7), pp.663-686.

McAdam, R. and Bailie, B., 2002. *Business performance measures and alignment impact on strategy: The role of business improvement models*. International Journal of Operations & Production Management, 22(9), pp.972-996.

Meekings, A., 1995. *Unlocking the potential of performance measurement: A practical implementation guide*. Public Money & Management, 15(4), pp.5-12.

Mendibil*, K. and MacBryde*, J., 2005. *Designing effective team-based performance measurement systems: an integrated approach*. Production Planning & Control, 16(2), pp.208-225.

Meyer, H.H., Kay, E. and French, J.R.P. (1995). Split roles in performance appraisal. *Harvard Business Review*, 43, pp. 123-129.

Molina-Azorín, J.F., Tarí, J.J., Claver-Cortés, E. and López-Gamero, M.D., 2009. *Quality management, environmental management and firm*

performance: a review of empirical studies and issues of integration. International Journal of Management Reviews, 11(2), pp.197-222.

Möller, A. and Schaltegger, S., 2005. The Sustainability Balanced Scorecard as a Framework for Ecoefficiency Analysis. *Journal of Industrial Ecology*, 9(4), pp.73-83.

Nappi, V. and Rozenfeld, H., 2015. *The incorporation of sustainability indicators into a performance measurement system*. Procedia CIRP, 26, pp.7-12.

Neely, A., 1999. The performance measurement revolution: why now and what next?. *International journal of operations & production management*, 19(2), pp.205-228.

Neely, A., Gregory, M. and Platts, K., 1995. Performance measurement system design: a literature review and research agenda. *International journal of operations & production management*, 15(4), pp.80-116.

Neely, A., Gregory, M. and Platts, K., 2005. *Performance measurement system design: A literature review and research agenda*. International journal of operations & production management, 25(12), pp.1228-1263.

Neely, A., Mills, J., Gregory, M., Richards, H., Platts, K. and Bourne, M., 1996. *Getting the measure of your business*, University of Cambridge. Manufacturing Engineering Group, Mill Lane, Cambridge.

Neely, A., Mills, J., Platts, K., Richards, H., Gregory, M., Bourne, M. and Kennerley, M., 2000. *Performance measurement system design: developing and testing a process-based approach*. International journal of operations & production management, 20(10), pp.1119-1145.

Neely, A., Richards, H., Mills, J., Platts, K. and Bourne, M., 1997. *Designing performance measures: a structured approach*. International journal of operations & Production management, 17(11), pp.1131-1152.

Neely, A.D., Adams, C. and Kennerley, M., 2002. *The performance prism: The scorecard for measuring and managing business success*. London: Prentice Hall Financial Times.

Nudurupati, S.S. and Bititci, U.S., 2005. *Implementation and impact of IT-supported performance measurement systems*. Production Planning & Control, 16(2), pp.152-162.

Nudurupati, S.S., Bititci, U.S., Kumar, V. and Chan, F.T., 2011. *State of the art literature review on performance measurement*. Computers & Industrial Engineering, 60(2), pp.279-290.

Otley, D., 1999. *Performance management: a framework for management control systems research*. Management accounting research, 10(4), pp.363-382.

Parker, C., 2000. *Performance measurement*. Work study, 49(2), pp.63-66.

Pujari, D., Wright, G. and Peattie, K., 2003. Green and competitive: influences on environmental new product development performance. *Journal of business Research*, 56(8), pp.657-671.

Purbey, S., Mukherjee, K. and Bhar, C., 2007. *Performance measurement system for healthcare processes*. International Journal of Productivity and Performance Management, 56(3), pp.241-251.

Reid, G.C. and Smith, J.A., 2000. *The impact of contingencies on management accounting system development*. Management Accounting Research, 11(4), pp.427-450.

Richard, P.J., Devinney, T.M., Yip, G.S. and Johnson, G., 2009. Measuring organizational performance: Towards methodological best practice. *Journal of management*, 35(3), pp.718-804.

Rouse, P. and Putterill, M., 2003. *An integral framework for performance measurement*. Management Decision, 41(8), pp.791-805.

Sacer, I.M., Malis, S.S. and Pavic, I., 2016. *The Impact of Accounting Estimates on Financial Position and Business Performance–Case of Non-Current Intangible and Tangible Assets*. Procedia Economics and Finance, 39, pp.399-411.

Samuel, V.B., Agamuthu, P. and Hashim, M.A., 2013. *Indicators for assessment of sustainable production: A case study of the petrochemical industry in Malaysia*. Ecological Indicators, 24, pp.392-402.

Sanchez, R. and Heene, A., 2004. *The new strategic management: organization, competition and competence*. Wiley.

Sarkis, J., 2003. *A strategic decision framework for green supply chain management*. Journal of cleaner production, 11(4), pp.397-409.

Schendel, D. and Hofer, C.W. eds., 1979. *Strategic management: A new view of business policy and planning*. Little, Brown.

Schonberger, R., 1982. *Japanese manufacturing techniques: Nine hidden lessons in simplicity*. Simon & Schuster.

Schreyögg, G. and Steinmann, H., 1987. *Strategic control: A new perspective*. Academy of management Review, 12(1), pp.91-103.

Scott, T.W. and Tiessen, P., 1999. *Performance measurement and managerial teams*. Accounting, Organizations and society, 24(3), pp.263-285.

Searcy, C., 2012. *Corporate sustainability performance measurement systems: A review and research agenda*. Journal of business ethics, 107(3), pp.239-253.

Sherman, H.D. and Young, S.D., 2016. Where financial reporting still falls short. *Harvard business review*, 94(7), p.17.

Simons, R., 2008. *Control in an Age of Empowerment*. Harvard Business Review Press.

Simons, R., 2013. *Levers of control: How managers use innovative control systems to drive strategic renewal*. Harvard Business Press.

Skinner, W., 1974. *The decline, fall and renewal of manufacturing*. Industrial Engineering, 6(10), pp.32-38.

Slack, N., 1983. *Flexibility as a manufacturing objective*. International Journal of Operations & Production Management, 3(3), pp.4-13.

Souto, B.F.F., 2009. Crisis and corporate social responsibility: threat or opportunity?. *International Journal of Economic Sciences and Applied Research*, (1), pp.36-50.

Speziale, M.T. and Klovienė, L., 2014. *The relationship between performance measurement and sustainability reporting: a literature review*. Procedia-Social and Behavioral Sciences, 156, pp.633-638.

Steiner, G.A., 1969. Book Review: Top Management Planning. *Academy of Management Journal*, 12(1), pp.131-132.

Suzaki, K., 1987. *The New Manufacturing Challenge: Techniques for Continuous Improvement*. New York, NY: The Free Press Publishers.

Swinehart, K.D. and Smith, A.E., 2005. Internal supply chain performance measurement: A health care continuous improvement implementation. *International Journal of Health Care Quality Assurance*, 18(7), pp.533-542.

Taticchi, P., Tonelli, F. and Cagnazzo, L., 2010. Performance measurement and management: a literature review and a research agenda. *Measuring business excellence*, 14(1), pp.4-18.

Taylor, F.W., 1911. *The Principles of Scientific Management*. New York, NY: Harper Brothers.

Thomas, M. and McElroy, M., 2015 *A Better Scorecard for Your Company's Sustainability Efforts*, Harvard Business Review, [Online], Available: <https://hbr.org/2015/12/a-better-scorecard-for-your-companys-sustainability-efforts> [23rd October 2017].

Tsai, W.H. and Hung, S.J., 2009. *A fuzzy goal programming approach for green supply chain optimisation under activity-based costing and performance evaluation with a value-chain structure*. International Journal of Production Research, 47(18), pp.4991-5017.

Tucker, M. and Pitt, M., 2009. Customer performance measurement in facilities management: a strategic approach. *International Journal of Productivity and Performance Management*, 58(5), pp.407-422.

UNEP, 2015. *Raising the Bar – Advancing Environmental Disclosure in Sustainability Reporting*. United Nations Environmental Programme, [Online], Available: <http://dnvglhealthcare.com/internal_redirect/cms.ipressroom.com.s3.amazonaws.com/107/files/201510/-Raising_the_Bar_-_Advancing_Environmental_Disclosure_in_Sustainability_Reporting-2015UNEP_Raising_the_Bar_2015.pdf.pdf> [Accessed 1st April 2017].

Van Vijfeijken, H., Kleingeld, A., van Tuijl, H., Algera, J.A. and Thierry, H., 2006. Interdependence and fit in team performance management. *Personnel Review*, 35(1), pp.98-117.

Veleva, V. and Ellenbecker, M., 2001. *Indicators of sustainable production: framework and methodology*. Journal of cleaner production, 9(6), pp.519-549.

Veleva, V., Hart, M., Greiner, T. and Crumbley, C., 2003. Indicators for measuring environmental sustainability: A case study of the pharmaceutical industry. *Benchmarking: An International Journal*, 10(2), pp.107-119.

Waggoner, D.B., Neely, A.D. and Kennerley, M.P., 1999. The forces that shape organisational performance measurement systems: An interdisciplinary review. *International Journal of Production Economics*, 60, pp.53-60.

Wheelen, T. L., and Hunger, J. P., 1983. *Strategic management and business policy*. Reading, MA: Addison-Wesley.

Whelan, T. and Fink, C., 2016. *The Comprehensive Business Case for Sustainability*, Harvard Business Review, [online]. Available: <https://hbr.org/2016/10/the-comprehensive-business-case-for-sustainability> [Accessed 21st March 2017].

Williams, D.W. 2002. *Before performance measurement*. Administrative Theory and Praxis, 24, 457-486.

Williams, D.W., 2003. *Measuring government in the early twentieth centur*y. Public Administration Review, 63(6), pp.643-659.

Williams, D.W., 2004. Evolution of performance measurement until 1930. *Administration & Society*, 36(2), pp.131-165.

Wilson, M., 2003. Corporate sustainability: What is it and where does it come from. *Ivey Business Journal*, 67(6), pp.1-5.

Wood, D.J., 2010. Measuring corporate social performance: A review. I*nternational Journal of Management Reviews*, 12(1), pp.50-84.

Xie, S. and Hayase, K., 2007. Corporate environmental performance evaluation: a measurement model and a new concept. *Business Strategy and the Environment*, 16(2), pp.148-168.