



The role of management accounting systems in global value strategies[☆]

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ABSTRACT

In this paper, we explore the relationship and interdependencies of firms' positions in global markets, innovation, foci on value creation or value development strategies and their intensity of use and system design of management accounting (MA) tools. We collect data through a survey of the 500 largest Portuguese firms. The results show multiple interdependencies of MA intensity of use and system design and global positioning as well as the value foci of firms. Global market positioning, as well as MA intensity, is directly associated with innovation. The multiple configurations also show that the value strategy focus (creating new products or solely developing them for different markets) changes the nature of the MA system put in place by firms. Consequently, we contribute to the discussion of MA systems vs MA packages by specifically addressing the fit and internal consistency of those tools. Methodologically, the results are robust to different analytical tools - multivariate regression, fuzzy-set qualitative comparative analysis (fsQCA) and factor analysis.

1. Introduction

The existing literature shows that management accounting (MA)³ tools are associated with the increasing flexibility that is necessary to respond to ever-present market changes (e.g. Nixon & Burns, 2012). Chenhall and Moers (2015) point to the fact that accounting systems moved from simple planning and control tools to more complex innovation-oriented systems. IFAC (1998) identifies four stages of evolution. These stages differ in their information provision and resource management. Initially, MA tools were focused on the determination of product cost. In the second stage, they were characterized as parts of management control systems. In the third stage, due to increased competition and rapid technological development, the tools were focused on the reduction of wasted resources. Finally, the fourth stage emphasized value creation. To align cost management with company strategy, the implementation of different strategic cost management tools became imperative (Cooper & Slagmulder, 1999).

Similarly, Håkansson and Lind (2006) review the relationship between organizations and their associations with accounting systems. These relations provide the basis for organizational development under

both dyadic and network relationships. Value creation emerges from those interorganizational relations in the form of both cooperating on information management in order to leverage value creation throughout the value chain and using hierarchical management control of information and processes in group networks. Accounting plays a fundamental role in providing information for prioritizing relations, offering feedback about those relationships, and finally, shaping the dynamics of coevolution. We argue for a role in both creating and increasing value and extend that value strategy globally.

Several papers pinpoint the gap between academic consensus on the definition and suitability of management accounting tools and their understanding and application to business cycle analysis by managers (Nixon & Burns, 2012).

This paper investigates the impact of global markets on the adoption of different MA tools and the role of those tools in innovation and value creation. Furthermore, we analyse the impact of different interorganizational structures as the basis for developing value creation and/or value “expansion”, where the latter focuses on replicating value at a global scale. To the best of our knowledge, we are the first to explicitly model those interdependencies.

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³ MA stands for management accounting throughout the text.

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Our results show multiple interdependencies of MA intensity of use, system design and global positioning as well as the value focus of the firm. Global market positioning, as well as MA intensity, is directly associated with innovation. The multiple configurations also show that the value strategy focus (creating new products or simply developing them for different markets) changes the nature of the MA systems that firms put in place. Consequently, we contribute to the discussion of MA systems vs MA packages by specifically addressing the fit and internal consistency of those tools. The results are economically relevant since MA tools require investment to implement and thus must have benefits that outweigh those implementation costs.

Our contribution is manifold: we extend existing literature by analysing tool adoption and value creation together under global inter-organizational relationships; further, we do so by adopting multiple integrated literature scales and by using the different methodologies as complements – multivariate regression and fuzzy-set qualitative comparative analysis. We extend empirical findings related to the analysis of MA tools as a system rather than as multiple individual packages of tools (e.g. [Grabner & Moers, 2013](#)). We also contribute by conceptually addressing the literature on value (e.g. [Mizik & Jacobson, 2003](#)). We extend previous research by defining value-creating, strategically focused firms as those that concentrate on internally developing, from inception, innovative products or services – similar to the definitions used in the existing literature – and value-developers as those firms that focus on adapting those innovations to new local markets and thus lack a true internal focus on innovation. We found no such distinction in the literature addressing the adoption of MA tools. Finally, we also extend previous research ([Gonçalves, Gaio, & Silva, 2018](#)) by focusing explicitly on the interdependencies of MA systems and innovation/value strategies rather than on the determinants of the adoption of MA tools.

The remainder of the paper is organized as follows. [Section 2](#) presents the conceptual map and propositions. In [Section 3](#), we explain the research method and data collection. [Section 4](#) discusses the results. [Section 5](#) highlights the main findings, the contributions of the study, and some implications from the findings.

2. Conceptual mapping and propositions

Given the exploratory nature of this paper, the research objectives based on our survey are presented in the form of propositions relating to the interdependencies of innovation, value (creation and development), the presence of the firm in global markets and the use of MA tools. Furthermore, we posit only the logical and/or empirically expected directions of those associations.

The role of innovation in organizational survival is an indisputable fact in the existing literature ([Damanpour & Gopalakrishnan, 2001](#); [Walker, Damanpour, & Avellaneda, 2007](#); [Chenhall & Moers, 2015](#)). It is considered a tool that allows better environmental adaptation because it facilitates an effective reaction in abrupt alterations, allowing the company to maintain or increase its effectiveness and competitiveness ([Damanpour & Gopalakrishnan, 2001](#)).

[Walker et al. \(2007\)](#) explain that innovation can be achieved through the introduction of new products or services to the market or through new internal procedures. [Damanpour and Gopalakrishnan \(2001\)](#) complete this argument, adding that the innovation of products or services is the type of innovation preferred by shareholders because these innovations are patent protected.

Given the global market and its related uncertainties, companies tended to feel the need to resort to information systems as support for decision-making. These new management needs resulted in a drastic evolution in MA tools. The systems evolved from simple and closed to open and complex ([Chenhall & Moers, 2015](#)).

In their study, [Abdel-Kader and Luther \(2006\)](#) divide the evolution of MA into four distinctive phases. Initially, in the 1950s, systems were focused on product costs and financial control. Thereafter, the focus remained on production; however, there was a higher demand from

management teams for information. As before, MA tools had a reactive nature wherein a problem would be detected only when a deviation from the budget occurred. The beginning of the third phase emerged with globalization and its consequent global competition. It was necessary to create new MA tools focused on cost control and the reduction of process waste. The fourth phase was focused on value creation and the efficient use of company resources. Due to the uncertainties of the competitive environment that were present in the 1990s, the focus of managements shifted once again. Value creation and the efficient use of resources were achieved through the use of technologies that allowed firms to identify client and shareholder value drivers ([Gonçalves et al., 2018](#)). In the last three phases, the focus changed; however, the need for information that began in the second phase did not disappear but rather was adjusted. Information is thus considered an important asset to companies. [Gonçalves et al. \(2018\)](#) also show that group affiliation, global presence through export sales, and the uncertainties of the competitive environment influence the adoption of more strategy-oriented MA tools (target costing).

Thus, we posit the following propositions consistent with those that were previously discussed:

Proposition 1. *Global market presence and the uncertainties of the competitive environment are directly associated with product and service innovation. These associations extend to strategies focusing on both value creation and value development.*

Proposition 2. *Global market presence and the uncertainties of the competitive environment are directly associated with the increasing need for information and thus affect the intensity of use of MA tools and shape MA system design.*

[Bisbe and Otley \(2004\)](#) study the association between the interactive use of management control systems (MCSs)⁴ and innovation success. Their study is based on two conditions: the use of MCS by management is directly associated with product innovation, or rather, with the effect of product innovation on organizational performance. The first proposition, whether the use of MCS encourages product innovation, remained unconfirmed. However, it was possible to validate the importance of formal MSC in innovations that enhance long-term company performance.

The results of [Bedford \(2015\)](#) and [Wijethilake, Munir, and Appuhami \(2016\)](#) are aligned with those of [Bisbe and Otley \(2004\)](#). The former demonstrate that interactive controls improve business performance and strengthen and improve the innovation process but do not increase the propensity for new product launch. In other words, MCSs have a mediating role between innovation and business performance.

Notwithstanding those results, [Grabner and Moers \(2013\)](#) analyse and review the conceptual and empirical issues relating to MCS as a system or package. The authors argue for significant theoretical and empirical differences between considering a bundle of individual (and static) adoption of MCS (as well as MA) tools embedded under a contingency theory framework and the explicit design of an MCS system where the organization looks for the internal consistencies of those tools, thus extending the analysis under a complementarity theory. Consequently, we argue for an internal consistency of MA related to the strategic foci that firms adopt when it comes to innovation and value creation and development.

⁴ We use the terms management accounting (MA) and management control systems (MCS) interchangeably. We identify both concepts as routines and techniques addressing the need for information aimed at helping in manager decision-making. The literature also distinguishes between the analysis of individual MA tools and the design of complex (synergic) systems of multiple individual MA tools that are put in place in the same organization ([Grabner & Moers, 2013](#)). Our focus in this paper is on the systems rather than on individual, specific tools.

Proposition 3. *The intensity of use of MA tools and their different system configurations is associated with a strategic focus on innovation and value creation/development.*

We conceptually extend the literature on value (e.g. Mizik & Jacobson, 2003). We extend previous research by defining value-creating, strategically focused firms as those that concentrate on internally developing, from inception, innovative products or services – similar to the definitions used in the existing literature – and value-developers as those firms that focus on adapting those innovations to new local markets, thus lacking a true internal focus on innovation. We proxy “value-creators” as firms that focus their MA tools on the development stage of new products, whereas “value-developers” are a proxy for those whose focus is on controlling the production stage. We found no such distinction in the literature addressing the adoption of MA tools.

The resource-based theory, formalized by Barney (1991), states that firms are heterogeneous because they have heterogeneous resources. Resources include assets, organizational processes, firm attributes, information and knowledge. Resources are valuable, enabling the firm to implement strategies that improve its efficiency and effectiveness; are rare; are imperfectly imitable; and are non-substitutable. Thus, resources are the main source of sustained competitive advantage, firm performance and value creation.

Due to global competition, increasing sophistication is needed to examine the determinants of value, to implement strategies that improve firm efficiency and effectiveness and thus to create customer value, shareholder value and firm innovation. In this sense, information technologies and MA can play important roles, enabling firms to use their resources efficiently and to develop value-creation strategies. The use of resources, such as information and organizational processes, to create value should be considered an integral part of MA (Abdel-Kader & Luther, 2006).

Finally, according to contingency theory, managers should develop organizational structures to face different contingencies in creating value and enhancing its appropriation. Contingency-framed studies attempt to determine the most appropriate (bundle or system) tools for a specific organization with its specific contingencies (Chenhall, 2006; Otley, 2016). Firms face increasing global competition, and reducing costs is no longer enough to sustain competitive advantage. Thus, firms perceive innovation as a way to respond to market changes and market demand to gain a competitive advantage (Damanpour &

Gopalakrishnan, 2001; Walker, 2006). To facilitate innovation and consequent value enhancement, the design of the organizational structure should fit the strategy of the firm.

Proposition 4. *Organizational structure and capabilities (such as internal resources focused on innovation) are directly associated with product and service innovation. These associations asymmetrically relate to strategies focusing on value creation or value development.*

Proposition 5. *Organizational structure and capabilities (such as internal resources focused on innovation) are directly associated with the increasing need for information and thus affect the intensity of use of MA tools and shape MA system design.*

Fig. 1 summarizes the conceptual model and presents the propositions under study.

3. Methods

3.1. Sample and data

Following Gonçalves et al. (2018), we surveyed the 500 largest firms in Portugal in the year 2015 as published by the magazine “Exame.” This sampling made size an endogenous factor.

Data were collected from an online survey targeted at firms’ financial controllers and officers (Cobanoglu, Warde, & Moreo, 2001). This survey, as in Gonçalves et al. (2018), was adapted from Afonso, Nunes, Paisana, and Braga (2008) and has already been used in several international markets (Garg, Ghosh, Hudick, & Nowacki, 2003). Additional questions stem from Cadez and Guilding (2008) and Juras (2014).

For clarity’s sake and for unequivocal identification of different MA tools without the use of specific vocabulary, we consider the main actions for each of the MA tools applied. By using action descriptions rather than technical names, we can identify the firms that knowledgeably adopt MA tools and those that use those tools without being aware of or familiar with the concept (Dekker & Smidt, 2003).

A total of 106 firms (22%) accessed and partially answered the survey, but only 61 fully completed it and were eligible for the analysis (13%). The results remain consistent after treatment for alternative missing values. Additionally, we rule out a nonresponse bias. Following Armstrong and Overton (1977), we compare the profiles of respondents and nonrespondents and find no significant differences. Of the

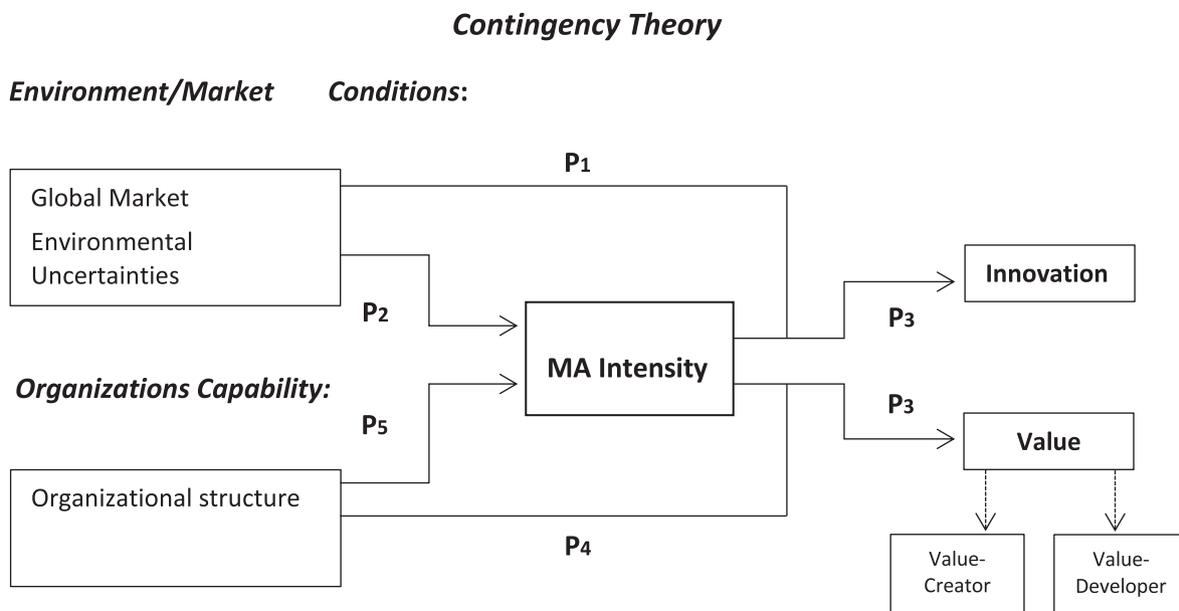


Fig. 1. Conceptual model (for constructs details see Appendix).

respondents, approximately 90.3% belong to an economic group. In terms of the main activities, 45.2% belong to manufacturing, 40.3% to services, and 14.5% to retail. In total, 72.6% have launched a new product in the last three years.

The internal consistency of the survey questions in the survey is measured with a Likert scale and leads to a Cronbach's alpha of 0.805. Additionally, internal validity is achieved by the research from which we adapted our research instrument (Garg et al., 2003; Afonso et al., 2008; Cadez & Guilding, 2008; Juras, 2014).

3.2. Innovation and value creation

We use two different regression models to explore the impact of MA on innovation (Innovation) and value creation (Value): a probit regression model (Eq. (1)) and a logistic regression model (Eq. (2))

$$\text{Innovation} = a + b_1\text{MA} + b_2\text{Org_Structure} + b_3\text{Global_Mkt} + b_4\text{UncertE} + b_5\text{Manufact} + e \quad (1)$$

$$\text{Value} = a + b_1\text{MA} + b_2\text{Org_Structure} + b_3\text{Global_Mkt} + b_4\text{UncertE} + b_5\text{Manufact} + e \quad (2)$$

Innovation is a binary variable that equals one if the firm has launched a new product in the past three years and zero otherwise (Bisbe & Otley, 2004). Value is defined as the time-to-market of new products compared to that of competitors. MA is adapted from a question that surveys how important the use of MA tools is. Both models control for the effect of (1) organizational capability to support the creation and development of new products (Org_Structure); (2) global markets (Global_Mkt); (3) environmental uncertainty; and (4) industry characteristics. Following previous research, we focus on manager perceptions of uncertainty because perceptions about the external environment are what truly affect decisions in organizations (Duh, Xiao, & Chow, 2009). The appendix provides more detailed information on variable definitions and constructs.

3.3. The role of management accounting

To further analyse the role of MA on innovation and value creation, we first run an ordered regression model (Eq. (3)) as follows:

$$\text{MA} = a + b_1\text{Org_Structure} + b_2\text{Global_Mkt} + b_3\text{UncertE} + b_5\text{Manufact} + e \quad (3)$$

To qualitatively explore, in our cases, the actual role of MA tools, we extend our data analysis through fsQCA. QCA is an instrument that allows the investigator to comprehend the behaviour (magnitude and direction effects) of a condition and its combination with others in a model that leads to a certain outcome (Ragin, 2008). The use of this technique permits the categorization of a causal condition between necessary and sufficient conditions (Ragin, 2008; Pappas, Kourouthanassis, Giannakos, & Chrissikopoulos, 2016). Finally, QCA considers the possibility that combinations of different conditions lead to the same outcome (Marx, 2006; Ganter & Hecker, 2014; Gonçalves, Gaio, & Costa, 2020).

The fsQCA analysis uses four conditions. The first variable (Org_Structure) tests the pre-existing organizational structure for product development. This variable tests whether the company has a clear internal structure to support the creation and development of new products. The second variable (Manufact) tests the influence of the company sector. The third variable (Global_Mkt) accesses the impact of global presence. Finally, the fourth variable (UncertE) tests the impact that significant changes in the competitive environment have on the adoption of MA tools.

To robustly address any non-linearity within the MA system put in place by different firms and previously captured by fsQCA, we also run a

factor analysis. By employing the factor analysis, we are able to find orthogonal factors that show different configurations of MA tools meant to address the fit of the information system to different strategic focuses. By using this factor analysis, we are able to identify which MA system designs emerge from our data, namely, by finding which MA tools are more correlated in our sample.

3.4. Value-creators and value-developers

We extend the research on the impact of MA on value creation by running model 2 separately for value-creator and value-developer companies to analyse whether the roles of MA, organizational structure and global markets on companies that create new products are different from those that only develop products created by others. The classification of value creators/developers is adapted from a question that surveys whether the focus of MA is on the development or the production phase of products.

4. Research results

4.1. Innovation and value creation

Table 1 shows the results for model 1. We find evidence of a positive significant association between innovation (measured by new products launched in the past 3 years) and the proposed contingent conditions: the presence of the firm in the global market (measured by a high percentage of export sales); the existence of an organizational structure meant to focus on internally developing a product, service or process innovation; and the intensity of use of MA tools.

In fact, the probability of innovation increases by almost two times when we compare firms with low-level or no MA systems with those that employ the largest set of MA tools. Doing business globally increases the chance of engaging in innovation by 1.3 times.

The results are consistent with previous research (Afonso et al., 2008; Gonçalves et al., 2018).

4.2. The role of management accounting

Table 1 also shows the results for model 2. We find no significant evidence of association between the MA system in place (measured in terms of the intensity of use of different tools) and the global positioning of the firm or any organizational structure focused on innovation. The results can be overshadowed by any non-linearity and/or asymmetrical configuration of the MA system, since the ordered logit requires linearity on the intensity of use and misses particularities of the distribution of that construct.

To explore the data and evaluate any nonlinear configuration that could justify the previous nonsignificant regression results, we employ fsQCA. The causal conditions are calibrated according to the sample data distribution. Binary variables are calibrated as crispy, whereas Likert scale-based variables are calibrated as fuzzy uniformly distributed from 0 to 1. None of the conditions are found to be strictly necessary. Table 2 shows the solution from fsQCA according to different combinations meant to address the concerns related to non-linear configurations. The table is constructed through a comparison between intermediate and parsimonious solutions to classify the conditions (Rihoux & Ragin, 2009). When a condition is present in both solutions, it is considered a core causal condition because it has a very strong causal relation. When the condition is visible only in an intermediate solution, it has a weaker causal relation and is termed peripheral (Ragin, 2008; Fiss, 2011).

Since the unique coverage of each combination shows that all must be considered empirically relevant, the total result shows a joint importance of 0.958333, which indicates that the majority of the results fall within the four combinations (Ragin, 2008; Rihoux & Ragin, 2009).

The results show different types of companies with distinctive

Table 1
Regression results.

	Probit Regression			Ordered Regression		Logit Regression	
	Innovation			MA		Value	
	<i>b</i>		<i>z</i> -Value	<i>b</i>	<i>z</i> -Value	<i>b</i>	<i>z</i> -Value
MA	1.91256	**	2.06			-0.62127	-0.43
Org_Structure	0.96106	***	2.56	0.75125	1.31	0.68935	1.21
Global_Mkt	1.27998	*	1.7	-0.03330	-0.04	0.49036	0.50
UncertE	1.36848	**	1.96	-0.39065	-0.46	-0.24372	-0.33
Manufact	-0.59565		-1.44	-0.05623	-0.10	0.52088	0.81
N	61			61		61	
Pseudo R square	0.2092			0.0168		0.051	

***p-value < 0.01.
**p-value < 0.05.
*p-value < 0.10.

Table 2
fsQCA results: configuration for MA tools importance.

	Solutions		
	1	2	3
Org_Structure	●		
Manufact		◦	●
Global_Mkt		◦	
UncertE			◦
Consistency	0.801471	0.919355	0.794118
Raw Coverage	0.756944	0.395833	0.375000
Unique Coverage	0.187500	0.159722	0.041667
Solution Coverage	0.958333		
Solution Consistency	0.821429		

Note: ● = core causal condition present; ● = peripheral causal condition present; ◦ = core causal condition absent; ◦ = peripheral causal condition absent.

characteristics, where MA tools are seen as valuable assets.

We complement our results by exploring cases in each configuration, namely, to match each group of firms to a system of MA tools that they adopt the most.

The first combination describes companies that have a clear structure to support the creation and development of new products. Here, MA tools are used in the innovation process. Further analysis of the cases included in this configuration shows that these firms use a combination of MA tools related to strategic cost management, such as target costing (Gonçalves et al., 2018).

The second type of companies are those that are not included in the manufacturing sector and are not present in the global market and thus are more local market-oriented. These types of companies have a cost-focused strategy.

The third type refers to manufacturing companies that do not face environmental uncertainties. These companies are likely to have a market monopoly, and the role of MA tools, such as in the previous combination, is more focused on cost and process optimizations and standardizations.

A detailed exploration of the firms included in these last 2 configurations provides evidence that these firms exhibit a lower use of strategic MA tools and are significantly more intensive in their use of traditional cost control tools.

Since a detailed exploration of the cases included in the different configurations points to different MA system designs, we run a factor analysis to evaluate the correlation structure of MA tool usage by the firms surveyed in our sample. We run the factor analysis using the perceived importance of all the tools of MA. By doing so, we are able to identify which tools are implemented together most often and which are used less in the same MA system. The results are presented in Table 3.

The factor analysis presents reliable results, with a KMO statistic of more than 0.76 and a Cronbach alpha of nearly 0.90. We identify two factors. Firms in our sample tend to design their systems either by

Table 3
Factor analysis.

	Factor 1	Factor 2
Attribute Costing	0.5519	
Life-Cycle Costing	0.4993	
Quality Costing	0.5874	
Target Costing	0.6242	
Value Chain Costing	0.3893	
Benchmarking	0.5689	
Integrated Performance Measurement	0.5807	
Strategic Costing	0.7107	
Strategic Pricing	0.7345	
Brand Valuation	0.7397	
Competitor Cost Assessment	0.7266	
Competitive Position Monitoring	0.7957	
Competitive Performance Appraisal	0.7755	
Customer Profitability Analysis		0.6779
Lifetime Customer Profitability Analysis		0.6428
Valuation of Customer as Assets	0.3641	
Eigenvalue	6.1415	1.2964

KMO value = 0.7638 Cronbach's alpha = 0.8935.

placing their focus on customer requirements (factor 2) or by fitting the remaining strategic MA tools in the same MA system (factor 1). The results shed further light on different theorized value-strategy foci.

Our results point to similar evidence as in Gonçalves et al. (2018) and Afonso et al. (2008). We find two groups of firms: those that comply with client (or economic group) requirements and thus design their MA systems to meet those requirements and those that compete under more autonomous (yet uncertain) conditions leading to the need for a more intense and broader use of MA tools.

4.3. Value-creators and value-developers

Table 1 also shows the results for a logit regression of the construct "value" (measured by time-to-market of new products/services compared to competition) on proposed contingent causal conditions - global market positioning; existence of a focused organizational structure to produce innovations; and the intensity of MA use. The results are once more inconclusive, probably due to a lack of linearity or asymmetric distribution of the value strategy in place.

To test whether there are such nonlinear relationships, we run separate probit regressions for value-creators and value-developers. Consequently, we subsample our firms into "value-creators" and "value-developers". We proxy "value-creators" as firms that focus their MA tools on the development stage of new products, whereas "value-developers" are proxied as those for which focus is on controlling the production stage. We find no such distinction in the literature addressing the adoption of MA tools. The dependent construct "value", as well as the causal conditions tested in the regression model, remain the same.

The results are presented in Table 4.

We find results that show positive associations between both value strategies and MA intensity as well as perceived market competition. Nevertheless, presence in global markets and the existence of specific innovation-oriented organizational structures present symmetric effects on value strategies.

Value-creators are positively affected by global markets and organizational innovation capabilities, while value-developers are negatively associated with global market weight on firm business as well as an increasing innovation-focused organizational structure. The results are yet not fully significant.

5. Conclusions

5.1. Discussion of empirical results

Our results allow us to empirically validate propositions 1 and 3 since we find a significant positive effect of global business on firm innovation, as well as the importance of the MA system on those processes of innovation. The impact is almost twofold that of the former over firms that exhibit less weight of sales in global markets and use MA tools less intensively. Similar to Bisbe and Otley (2004), Bedford (2015) and Wijethilake et al. (2016), our results show that MA tools are not sufficient to directly associate with innovation, but they improve business strategy, strengthening and improving the innovation process. In other words, MA tools have a mediating role between innovation and business performance.

We also find an association of MA intensity and MA system design with different interorganizational configurations and strategy foci. Firms tend to increase their intensity of use and the complexity of their MA systems because they want to either comply with customer requirements (or group affiliation pressure) or be able to compete in a more advantageous way in global markets where competition is fiercer. These results are in line with those of Gonçalves et al. (2018).

Finally, propositions 4 and 5 are also verified. We show a positive and significant association between organizational structure and innovation capabilities in line with previous literature. We also show an asymmetric relation between a value strategy and organizational structure. In fact, we find that MA systems are designed to fit the strategy and organization (as expected under contingency theory) but also show an internal consistency required by complementarity theory to guarantee the internal consistency of those tools (Grabner & Moers, 2013).

5.2. Research contributions and managerial implications

We extend the existing literature by analysing tool adoption and value creation together under global interorganizational relationships; further, we do so by adopting multiple integrated literature scales and by complementing different methodologies – multivariate regression and fuzzy-set qualitative comparative analysis (Felício, Duarte, & Rodrigues, 2016).

We extend empirical findings that relate to the analysis of MA tools as a system rather than a package of individual tools (Grabner & Moers, 2013). By explicitly modelling the adoption of MA tools in the context of further contingencies, we show multiple MA system configurations that point to the importance of academics and practitioners alike considering those tools as dynamic systems rather than as a static bundle of individual decisions to adopt each tool.

We also contribute by conceptually addressing the literature on value (Mizik & Jacobson, 2003). We extend previous research by defining value-creating, strategically focused firms as those that concentrate on internally developing, from inception, innovative products or services – similar to the definitions used in the existing literature – and value-developers as those firms that focus on adapting innovations to new local markets and that thus lack a true internal focus on innovation. We found no such distinction in the literature addressing the adoption of MA

Table 4
Additional analysis.

	Probit Regression		Probit Regression	
	Value Creator		Value Developer	
	b	z-Value	b	z-Value
MA	0.8388	1.01	0.29297	0.27
Org Structure	0.9910	***	-0.59237	-1.19
Global Mkt	0.3596	0.58	-1.66800	-1.63
UncertE	0.2852	0.65	0.30225	0.41
Manufact	-0.5556	-1.34	0	0.00
N	61		61	
Pseudo R square	0.1287		0.1081	

***p-value < 0.01.

**p-value < 0.05.

*p-value < 0.10.

tools.

Our results also reveal important implications for management. We show the importance of economically analysing different information management and control tools according to the strategic foci of firms. Our findings point to the need to adjust MA tools system design (the combination of different tools) to the contingencies the firm faces under different economic cycles and even under different interorganizational structures. No unique solution fits all organizations, and to adequately mediate the value strategy put in place, managers must consider potential synergies from custom-fit MA system designs.

5.3. Research limitations and future research avenues

Our results are based on a sample of the 500 largest firms in Portugal. We argue that the conclusions are not context-specific since Portugal does not significantly differ from other developed markets. Nevertheless, we urge additional research in other geographies to corroborate or identify context-specific contingencies that could affect the implications of our research.

Additionally, we analyse complex concepts that are difficult to measure, such as value strategy, environment uncertainty or even MA system complexity. This leads us to proxy, in a parsimonious way, these constructs with survey questions that try to capture the most relevant features of those concepts. Most of these proxies have already been tested in the previous literature on which our research instrument is based. However, this does not fully rule out any measurement error. Future research should consider the potential measurement bias of existing proxies as well as investigate potential substitute measures.

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