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Management Accounting Change as a Sustainable Economic Development Strategy during Pre-Recession and Recession Periods: Evidence from Russia

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Abstract: The volatility of both global and national markets has emerged in recent years. In response to the changes in the operating environment, organizations have been adopting various practices to ensure sustainable development by anticipating threats and managing risks. While many studies are focusing on the investigation of strategic adaptation to the volatile economic environment, there has been little research examining management accounting (MA) as a sustainable development strategy in times of economic turbulence. This study investigates the degree of variation in the use of MA practices induced by economic recession. Investigating the variations in management accounting practices in Russian organizations in 2000–2013 (pre-recession period) and 2014–2018 (economic recession), the authors explore the change across 54 MA tools split into operation, management, and strategy pillars. The contribution of this study to the literature involves the understanding of the use of particular MA tools across various types of organizations and industries before and during the economic recession, as well as discovering the intention to change the instruments in case the economic situation deteriorates. The survey of four types of organizations (micro, small, medium, and large) in five sectors (service, industry, trade, agriculture, and tourism) was conducted in seven territories of Russia differentiated on the level of their economic performance (well-performing, average, and declining). The survey revealed that, during the crisis, the respondents tend to drop using many of proactive sustainability-oriented MA tools and instead focused on achieving immediate and direct effects on sales, profits, and other performance parameters by employing less-sophisticated short-term MA instruments. The forecast of future application of MA tools in a falling economy revealed that, in an attempt to achieve durable and sustainable performance, the organizations of all types and sectors intended to focus on practices such as risk management variance analysis, rolling forecasts, payback, breakeven analysis, and activity-based management.

Keywords: economic crisis; management accounting; management decision making; recession; survey; sustainable economic development

1. Introduction

In recent decades, the global economic environment has become increasingly volatile. Instability affects all countries, all sectors, and all types of businesses [1]. In such conditions, the ability of an organization to anticipate and respond to external fluctuations is critical for its survival [2]. So far, the majority of the existing studies have focused on the investigation of how volatility-induced economic slowdowns and recessions might be responded to using strategy-related instruments, i.e., strategic planning, mapping, and management. In depressed macroeconomic conditions, firms encounter a stronger pressure to operate in a sustainable way and become increasingly transparent about sustainability-related management accounting (MA) practices they implement [3]. External pressures induce internal fluctuations, both of which are important factors of sustainability integration within corporate strategy amid economic decline. George et al. [4] found such amalgamation of external influences and internal responses as one of the enablers of change in MA practices. External pressures are prevalent in shaping management decision-making in relation to accounting, reporting, and control, while integration of sustainability-related accounting tools into performance management systems leads to better management and control of sustainability performance in business [4].

Accounting techniques, nevertheless, have received less attention as these are considered less related to any organizational changes and reporting on sustainability performance. However, the development of existing management accounting techniques along with the emergence of new MA tools have enabled the organizations with a possibility to focus on not only financial information but also non-financial issues and thus to provide a strategic scope to sustainability management decisions. Specifically, sustainability management accounting (SMA) and sustainability reporting (SR) have integrated performance measurement accounting tools which communicate the information about how a firm acts to improve its economic effectiveness and efficiency. Transforming the economic environment imposes the need for adaptation of MA practices to respond to the changing conditions of the markets, the behavior of competitors and consumers, economic policies of the government, and other factors [5]. The effectiveness of management decisions is increasingly determined by the ability of a firm to generate qualitative information about the actions it has taken, results achieved in terms of economic and social sustainability, and the need to improve internal business processes [6]. In a volatile economic environment, firms increasingly rely on SMA and SR as comprehensive processes of the collection, analysis, and communication of sustainability-related information [7].

Although the research in the field of SMA and SR has been on the agenda for several decades already, the empirical evidence has been mainly based on case studies [8,9] most of which captured MA practices in developed countries. Few of them have analyzed the adoption of MA tools in more vulnerable economic environments in developing countries and even fewer have ever addressed the practices of management accounting in Russia. In the beginning of the 1990s, Russia started reforming its accounting and reporting system to converge it with the International Financial Reporting Standards (IFRS). The adoption of the IFRS has led to a significant revision of accounting methodology [10] and resulted in financial performance of the Russian companies [11] during the 2000s. In 2014, the Russian economy was hit by sanctions and rapidly falling oil prices. These shocks led to a significant balance of payment pressures with a surge in capital outflows and depreciating exchange rate [12]. Since that time, Russia has been experiencing economic decline further dampened by the intensification of geopolitical tensions. Very few studies, however, have investigated the effects of economic volatilities on the changes in the application of MA practices in the Russian organizations after 2014. Due to the fact that, in the course of over two decades of the reform, Russia has not fully adjusted its national accounting and reporting system to the IFRS, the findings of international studies cannot be fully employed to reflect and explain de facto reactions of Russian companies on the change of economic situation in the country. The limitations in the application of the IFRS in Russia are related to the national peculiarities of application of professional judgment and the specific approach to the interpretation of economic events [11]. Technically, in many companies, financial statements are still drawn up in accordance with the Russian system of accounting which in turn is being transformed to the IFRS framework

“with due account for the specific circumstances and the analysis of encountered problems” [13]. Beyond the technical aspects of management accounting, engaging with sustainability accounting in Russia poses a challenge of understanding how the application of particular MA tools can contribute to improving performance of a firm and ensuring its resistance to the volatilities of the external economic environment.

The purpose of this study is to contribute to the understanding of the MA change induced by economic recession and the way in which it can lead to the changes in sustainability performance of the firms. The paper is structured as follows. In Section 2, the authors overview major studies related to the topic of the paper and develop a narrative around the relationships between economic recession, sustainability, and the ways in which the firms can respond to external volatilities of economic environment by using various MA tools. The approach adopted in investigating the above research questions is presented in Section 3. In Section 4, this study involves the survey of the four types of organizations in various industries in Russia about the use of MA tools in the pre-recession period of 2000–2013, the change in 2014–2018 as a response to economic decline, and the intentions to adopt MA practices in case the economic situation deteriorates. In Section 5, the authors’ findings are discussed in relation to the prior literature along the three pillars of management accounting, economic volatility, and sustainable development. In Section 6, the authors summarize all findings, implications, and contributions, as well as refer to the limitations of the study and point out future research directions.

2. Literature Review

A review of the prior literature allows two streams of accounting–sustainability–narrative to be revealed. On the one hand, the contribution of MA to sustainable development has been questioned from a point of view of the critical social accounting perspective, particularly, by Gray [14] and Zvezdov [9]. On the other hand, in some sources, specifically, in the works of Burritt and Schaltegger [15], Siti-Nabiha and Scapens [16], and Schaltegger and Burritt [17], a management approach to accounting supports sustainability management, while SMA and SR are recognized among the contributors to measuring and managing sustainability performance.

A number of studies have established a theoretical background for the idea that management accounting tools can serve an active role in improving sustainability performance, supporting managerial decisions, and shaping organizational changes [18–20]. Celik [21] observed that companies could ensure sustainability by employing proper accounting practices prior to and pursuant to the economic crisis. Many other studies have been devoted to solving general theoretical, methodologic, and methodological aspects of management accounting as one of the tools of sustainable performance [22–27], particularly, the model of management accounting based on the ideas of organizational control and efficiency [28]; various aspects of setting the system of budgeting in an enterprise [2,29,30]; the concept of the balanced scorecard [31–34]; the role of communication in the decision-making system based on management accounting [35]; the role of management accounting in the development of performance evaluation systems [36]; issues of genesis and prospects for further development of management accounting [37–42].

Many of the previous studies have examined the factors influencing SMA and SR. Adams and McNicholas [43] studied SR in relation to accountability and organizational change and identified the impediments to the development of SR framework and its integration into planning and decision making. Gond et al. [44] developed a research framework that delineated a set of possible relationships between sustainability issues, management accounting, reporting, control, and organizational strategy, while Caputo et al. [45] investigated how traditional and new MA tools and management control systems may be integrated into different sustainability strategies and thus affect organizational changes. George et al. [4] studied the role of accounting technologies, specifically performance management and reporting systems, in supporting sustainability integration into strategic operations across various types of organizations and recognized management accounting as one of the effective

sustainability embedding mechanisms. It is worth mentioning the works devoted to the problems of transformational processes of accounting and analytical support for the management of economic entities [46–53]. The formation of the concept of the enterprise business model under the influence of macroeconomic factors was completed by Magretta [54]; the description of inflation accounting methods was performed by Davis-Friday and Rivera [55], Konchitchki [56] and Robson [57]; trajectories of management accounting development were investigated by Luft and Shields [58]; the transformation of managers information needs was studied by Anderson and Lanen [59]; new planning and control mechanisms in managerial accounting were investigated by Chenhall and Langfield-Smith [36].

While previous studies have discussed the role of management accounting and performance management systems in supporting sustainability, few of them have captured the organizational responses to economic recessions. Much of the literature in the area of accounting–sustainability relationships has examined the factors of and motivations for SMA without proper reference to the internal organizational context, notwithstanding that a volatile economic environment imposes a significant effect on the performance of the firms at not only macro but also micro levels [43,60]. Economic, financial, and, particularly, accounting footprints of sustainability are unclearly expressed and thus rarely used [61], which calls for the need to adapt management methods to unstable conditions and, accordingly, requires the development of new, more effective methods for generating information and making proper managerial decisions in the times of economic transformation. In the beginning of the 2000s, Adams [62], Larrinaga-Gonzalez et al. [63], and O'Dwyer [64,65] were among the first to study the internal accounting and reporting processes through the lenses of their impact on organizational change. In continuation of their studies, Mat et al. [66] assessed the level of employment of various MA practices in response to the changing business environment, including rapid developments in information and communication technology, development of computer-based production systems, and integration of smaller firms into larger ones. Van der Stede [67] offered reflections on opportunities and challenges for management accounting research in the wake of the financial crisis and discussed a continuing need to study incentives, risk management, and budgeting.

In Russia, despite the extreme volatilities of the economic environment during the 1990s and adverse effects of the economic crisis of 2008–2009 on business, few studies have addressed accounting practices through a prism of sustainable development. A description of separate methodical approaches to management accounting in the conditions of the economic crisis may be found in Bobryshev et al. [68], Truhachev et al. [69], and Yakubiv [70]. On the back of recession in Russia, sustainability-related MA research has been attracting increasing scholarly attention, but its focus is on the macro level, whereas a limited attention has been paid to the role of MA instruments in supporting sustainability within organizations at the micro level. Litvin et al. [71] examined the problem of the differentiation of territories at the macro level under the influence of crisis factors. Elchaninova et al. [72] and Gerasimov et al. [73] studied the ways of balanced development of socio-economic systems in the context of crisis processes in the Russian economy. Despite the emerging consideration of MA effects on sustainable operation of a firm in the conditions of economic crisis, there are questions that still remain unanswered. First, which particular effects economic recession imposes on the application of MA tools. Second, how exactly MA practices may contribute to the improvement of economic sustainability of a firm in the volatile environment. Third, in Russia, less is understood of the de-facto MA practices within organizations and how they are transforming over the period of economic decline.

Another problem in understanding the true relationship between accounting practices and sustainability is endogeneity of influencing factors. Managerial decisions are typically determined by a set of external and internal factors, the causality of which increases when exposed to the volatilities of the external economic environment. Different choices in organizational behavior are linked to one another, but change in various manners in response to the environmental changes [74]. So far, there have been many studies addressing the endogeneity problem in relation to management accounting. Chenhall and Moers [75] provided an overview and discussion of endogeneity as well as possible solutions to the problem. Li [76] attempted to summarize econometric methods that are commonly used to address

endogeneity concerns and illustrated how generalized method of moments, instrumental variables, fixed effects models, lagged independent variables, and control variables could be used to mitigate the endogeneity problem. Coles et al. [77] addressed the endogeneity concerns through the lens of firm performance and external uncertainties and their influence on industry pay gap. Abdallah et al. [78] presented the case studies and provided the insights into how endogeneity may be controlled in empirical analysis. To the best of the authors' knowledge, none of the previous studies have addressed the endogeneity problem in relation to management accounting in Russia.

3. Materials and Methods

Previous studies have equipped organizations with a range of tools to measure their performance and decide on strategic directions of development in various economic conditions. To reveal an extent to which business has settled on the currently available set of tools or is searching for alternative solutions to ensure sustainability in the times of economic decline, the authors utilized a six-question survey consisting of two parts.

In part one (questions 1–3), at the beginning of the survey, a question was asked whether or not the respondent represented a company located in one of the regions included in the study. To reflect the complexity of economic recession effects, seven territories of Russia were included in the survey: well-performing—those >10% above the national average rate of growth (Moscow city and Krasnodar region), average—within $\pm 10\%$ corridor around the national average rate of growth (Kaluga and Kaliningrad), and declining—those >10% below the national average rate of growth (Stavropol, Arkhangelsk, and Khabarovsk regions).

In question 2, the respondents were asked if the company operated in one of the sectors included in the survey. According to Coles et al. [77], in different sectors, industry performance risk influences firm performance risk and sustainability in various extents. Through financial policy, increasing risk can generate uncertain performance. The higher the volatility in the market, the more uncertainty there is about winning the competition. Better growth opportunities in a particular sector result in higher performance and stability but lead to an increase in the expected value of performance gap between sectors. To provide cross-sectoral comparisons of the recession-induced changes in application of MA tools, the study included service sector (professional, financial, and other types of services) (particularly developed in Moscow city), industry sector (Kaluga, Arkhangelsk, and Khabarovsk regions), retail and trade (Moscow city and Kaliningrad region), agricultural production (Stavropol, Krasnodar, and Khabarovsk regions), and hospitality and tourism (Stavropol and Krasnodar regions).

Qualifying questions 1 and 2 were intended to ensure that a respondent was aligned with the proposed sample group. The questionnaires received from the territories or sectors not included in the survey were removed from the sample. To send the questionnaires and collect responses from the respondents, the authors used the SurveyMonkey platform. The invitations to complete the survey (information about the purpose of the study, description of the content, and a link to the SurveyMonkey page) were emailed to 358 potential respondents—accounting specialists, operational managers, and senior managers of the private companies located in the selected territories and operating in the selected sectors. Contact details of the companies and responsible employees were obtained from the Catalogue of Russian Enterprises [79]. Its interface allows the use of filters and selection of organizations across various sectors in all territories of Russia. Of the completed questionnaires, 166 were received, 153 of which were qualified for the study.

In question 3, the respondents were asked about the size of the company. The coefficients of firm size measures are robust in sign and statistical significance, that is why we considered size as the key variable which affects all the variables included in our study. Frank and Goyal [80], Rajan and Zingales [81], and Moeller et al. [82] all reported that firm size affected the empirical results in the sphere of corporate finance. As demonstrated by Dang et al. [83], the most popular firm size proxies used in empirical studies are total assets, total sales, and market value of equity. In Russia, however, all the three parameters relate to the commercially sensitive information. Therefore, we did not

expect the respondents to disclose the commercial data in the questionnaires and instead used the number of employees suggested by Dang et al. [83] and Hart and Oulton [84] as an alternative firm size measure when the main measures were not available or irrelevant. The cut-off for the classification was based on the Federal Law of the Russian Federation “On the Development of Small and Medium-Sized Entrepreneurship in the Russian Federation” [85]. Out of 153 qualified, there were 21 micro organizations (below 15 employees), 67 small-sized firms (15–100 employees), 36 medium-sized companies (101–250 employees), and 29 large enterprises (over 251 employees).

In part 2 (questions 4–6), it was suggested that the respondents select the MA tools commonly utilized in their companies in the pre-recession period of 2010–2013 (question 4) and the period of economic recession in 2014–2018 (question 5). Lastly, in question 6, the respondents were asked which MA tools their companies would continue using (or the new ones they would adopt) to improve sustainability as the economic situation deteriorated. The MA tools were split into three pillars and ten categories (Table 1), it was suggested that the respondents select up to three tools per category.

Table 1. Management accounting tools included in the survey.

Pillar	Category	Tool	Abbreviation
Operation	Cost	Costing for Jobs	CJ
		Full Costing	FC
		Marginal Costing	MC
		Overhead Allocation	OA
		Standard Costing	SC
		Variance Analysis	VA
	Price	Cost-Plus Pricing	CPP
		Market-Sensitive Pricing	MSP
		Segmental Pricing	SP
		Price Skimming	PS
		Penetration Pricing	PP
		Cash Forecasts	CF
	Budget	Financial Year Forecasts	FYF
		Flexible Budgeting	FB
		Incremental Budgeting	IB
		Rolling Forecasts	RF
		Zero-Based Budgeting	ZBB
		Breakeven Analysis	BA
	Profitability	Customer Profitability Analysis	CPA
		Economic Value to Customer	EVC
		Product/Service Profitability Analysis	PPA
		Relevant Costing for Decisions	RCD
		Internal Rate of Return	IRR
		Net Present Value	NPV
	Investment	Non-Financial Issues	NFI
		Payback	P
Post Completion Audits		PCA	
Sensitivity Analysis		SA	
Cash Flow Return on Investment		CFRI	
Economic Value Added		EVA	
Profit Before Tax		PBT	
Residual Income		RI	
Return on Capital Employed		RCE	
Activity-Based Management		ABM	
Management	Performance measurement	Balanced Scorecard	BS
		Business Process Re-Engineering	BPRE
		Total Performance Scorecard	TPS
		Value-Based Management	VBM
		Six Sigma	SS
	Performance management	Exclusive Incentive Schemes	EIS
		Management Incentive Schemes	MIS
		Profit Sharing Schemes	PSS
		Share Options	SO

Table 1. Cont.

Pillar	Category	Tool	Abbreviation
Strategy	Performance reporting	Contribution after Variable Costs	CVC
		Gross Margin after Full Costs of Sales	GMFCS
		Net Profit Margin after Allocation of Overhead	NPMAO
		Segment Contribution after Attributable Costs	SCAC
	Strategic techniques	Value-Added Reporting	VAR
		Competitor Analysis	CA
		Core Competencies	CC
		Risk Management	RM
		Strategy Mapping	SM
		SWOT Analysis	SWOT
		Value Chain Analysis	VCA

Source: authors' development.

The selection of the MA tools and their distribution along the pillars and categories was based on the recommendations of the Chartered Institute of Management Accountants (CIMA) [86]. Operation pillar included the tasks demanded by the organization, specifically, costing of activities, pricing of products, analysis of profitability of revenue-generating activities, and allocation of available assets by means of budgeting and investment. The management pillar was concerned with how economic performance was measured and which tools were applied to manage it in the conditions of economic recession. The reactions of the respondents to the economic environment were then mediated by strategy pillar tools in two directions: first, reporting to senior management, stakeholders, and a wide audience, and, second, affecting strategic decision making.

The application of the survey method revealed the patterns and features of the transformation of management accounting in Russia under the influence of the economic downturn. It also allowed establishing new approaches to management accounting in response to the deteriorating economic environment, as well as discovering explicit and hidden factors that promoted and hindered the development of management accounting in a country which experienced an economic recession.

4. Results

On average, respondents use by and large between two and three major tools in each of the categories surveyed. Among operation pillar MA tools, the most widely used ones were variance analysis (VA; cost category), cost-plus pricing (CPP; price category), financial year forecasts (FYF; budget category), product/service profitability analysis (PPA; profitability category), and net present value (NPV; investment category) (Figure 1).

In most of the categories, a current set of tools is different from that used in the pre-recession period of 2010–2013. Among cost tools, respondents lean toward such flexible and adaptive instruments as variance analysis and overhead allocation over standard and full costing. As the purchasing power of population deteriorates, market-sensitive pricing is gaining ground as the second most widely used tool in the pricing category in favor of segmental pricing and price skimming. In the budget category, business abandoned the common FYF tool and increasingly focused on rolling forecasts (RF), incremental budgeting (IB) and flexible budgeting (FB). It reflects the tendency of using those budgeting techniques which provide greater and tighter control and oversight of expenditure in the conditions of budgetary constraints. Among profitability analysis tools, there was still high overall level of interest in PPA, but it decreased as those companies which face economic troubles get concerned about breakeven analysis and seek custom-oriented approaches.

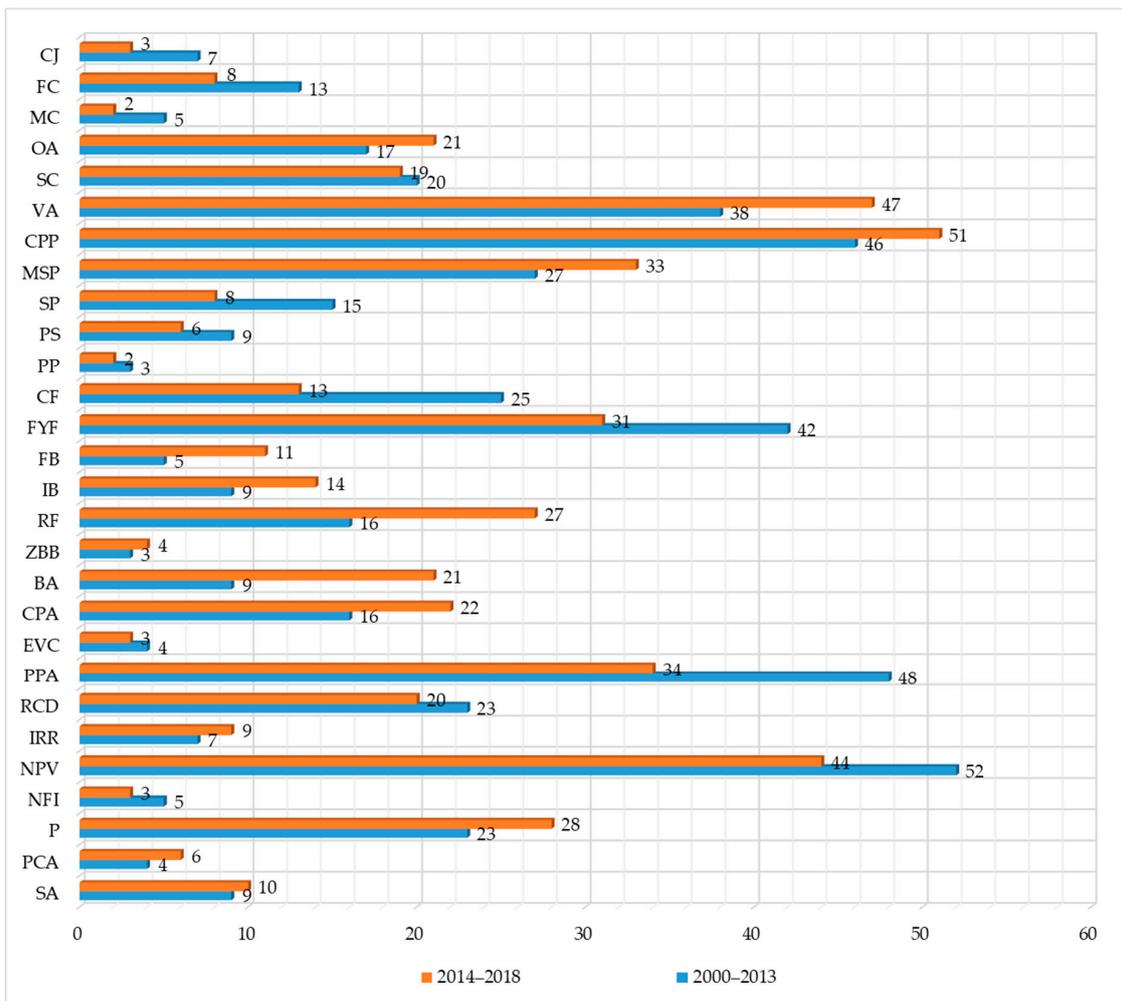


Figure 1. Management accounting tools: operation pillar, percentage of respondents. Source: authors’ development.

The surveyed organizations reported on the growing concern of profit and cash flow returns as the two critical performance measurements in the times of economic recession (Figure 2). When it comes to the use of performance management tools, activity-based management (ABM) gains widespread attention due to its orientation on current activities of an organization and responsiveness, the two characteristics crucial in the vulnerable economic environment. Among reward tools, responsiveness stipulated the emergence of profit-sharing schemes in favor of exclusive incentive schemes (EIS) and management incentive schemes (MIS) as profit sharing schemes (PSS) allowed the establishment of a direct and immediate link between performance and reward.

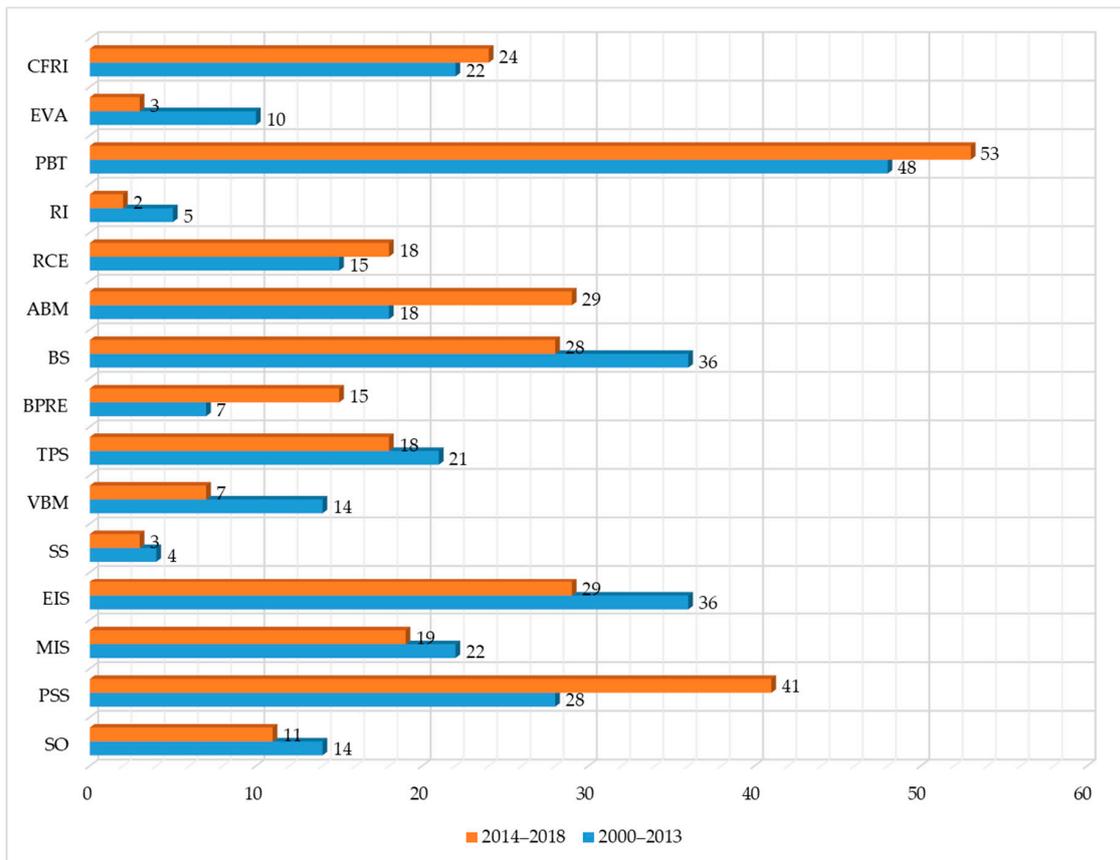


Figure 2. Management accounting tools: management pillar, percentage of respondents. Source: authors' development.

Very largely because of a similar reason, the advantages of direct tools in the conditions of economic changes conditioned the emergence of reaction-based short-term instruments in favor of pro-action long-term oriented strategic approaches. In the pre-recession period, respondents used a combination of measures to develop and manage their strategies, including strategic mapping, value chain analysis, Strengths-Weaknesses-Opportunities-Threats analysis (SWOT), and other future-looking management techniques (Figure 3). The economic downturn, however, made strategic planning less applicable compared to immediate reactions and thus prompted the relevance of risk management tools and analysis of competitors.

The tendency of switching to short-term tools over strategic planning was particularly prominent in, the territories in which the pace of economic growth is below the Russia's average (Arkhangelsk, Khabarovsk, and Stavropol). In well-performing territories, over 55% of respondents either continued using strategic mapping as the major strategic technique or increasingly employed competitor analysis, but did not entirely shift their focus to managing short-term risks (Table 2).

There was also a significant distinction of declining territories in terms of using RF as the major budgeting tool. In Moscow city, Kaluga, Krasnodar, Stavropol, and Kaliningrad regions, most of the respondents did not report considerable changes in using FYF as the major budget category tool. In Khabarovsk and Arkhangelsk regions, quite the reverse, many organizations acknowledged RF as the most appropriate tool to control expenditures.

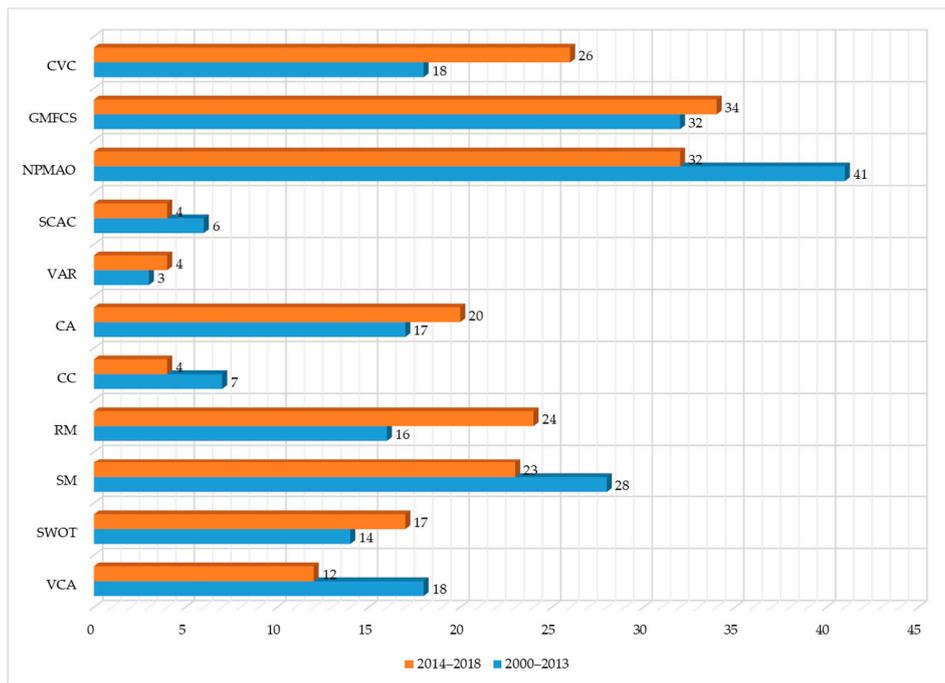


Figure 3. Management accounting tools: strategy pillar, percentage of respondents. Source: authors’ development.

Table 2. Survey results: economic performance.

Category	2000–2013			2014–2018		
	Well Performing	Average	Declining	Well Performing	Average	Declining
Cost	VA	OA	SC	VA	VA	VA
	OA	VA	FC	OA	OA	SC
	SC	SC	VA	SC	SC	FC
Price	CPP	CPP	MSP	CPP	MSP	CPP
	SP	MSP	CPP	SP	CPP	MSP
	PS	SP	SP	MSP	SP	SP
Budget	FYF	FYF	FYF	FYF	FYF	RF
	CF	CF	RF	CF	RF	IB
	RF	RF	IB	RF	FB	FB
Profitability	PPA	PPA	PPA	PPA	CPA	BA
	RCD	CPA	RCD	CPA	PPA	RCD
	CPA	RCD	BA	RCD	BA	PPA
Investment	NPV	NPV	NPV	NPV	NPV	P
	P	P	P	P	P	NPV
	SA	NFI	IRR	SA	IRR	PCA
Performance measurement	PBT	PBT	PBT	PBT	PBT	PBT
	CFRI	CFRI	CFRI	CFRI	CFRI	CFRI
	EVA	RCE	RCE	RCE	RCE	RCE
Performance management	BS	BS	TPS	BS	TPS	ABM
	VBM	TPS	BS	ABM	BPRE	BPRE
	TPS	VBM	ABM	TPS	ABM	BS
Rewards	EIS	MIS	PSS	MIS	PSS	PSS
	MIS	PSS	MIS	EIS	MIS	MIS
	SO	EIS	EIS	PSS	EIS	EIS
Performance reporting	NPMAO	NPMAO	GMFCS	NPMAO	GMFCS	CVC
	GMFCS	GMFCS	CVC	GMFCS	NPMAO	GMFCS
	CVC	CVC	NPMAO	CVC	CVC	NPMAO
Strategic techniques	SM	CA	SWOT	CA	SWOT	RM
	CA	SWOT	RM	SM	CA	CA
	VCA	SM	CA	RM	RM	SWOT

Source: authors’ development. Note: top three tools per category and period.

Another finding is that, in declining territories, the economic recession has induced many organizations to change over to payback instead of NPV as the investment category tool. Among the investment-related management accounting tools, payback (P) is the least sophisticated and crudest appraisal technique, which, however, gains importance in the times of economic decline, when businesses seek early payback instead of unsecured long-term investment.

The survey allowed the discovery of the variation in the employment of MA tools between the sectors, particularly, between the service sector and manufacturing. There are tools which usage varied significantly by sector—categories of price, budget, rewards, among others (Table 3). This might reflect a more flexible approach to pricing, budgeting, and situational management in the service sector compared to the industry, as price comparison is much harder for clients who use services than for customers who buy products [86]. When market shrinks because of declining purchasing power of population, service sector seems comparatively keener on adopting new pricing tools, especially demonstrating the interest in market sensitive pricing and segmental pricing. Conservative sectors such as industrial production and agriculture appeared to be less responsive to economic transformations in terms of management accounting, as well as more reluctant to introducing new practices in response to the changes in the economic environment. In the times of recession, organizations in the service sector, trade, and tourism tend to prioritize short-term profit and cash inflow over long-term investment and thus increasingly employ profit sharing schemes and activity-based management practices to ensure immediate inflows.

Table 3. Survey results: sector.

Category	2000–2013					2014–2018				
	Service	Industry	Trade	Agriculture	Tourism	Service	Industry	Trade	Agriculture	Tourism
Cost	VA	OA	FC	FC	FC	VA	VA	VA	VA	VA
	OA	VA	MC	SC	VA	FC	OA	FC	FC	SC
	SC	MC	VA	VA	CJ	SC	CJ	OA	SC	FC
Price	SP	MSP	CPP	CPP	SP	MSP	MSP	CPP	CPP	MSP
	MSP	SP	SP	MSP	PP	SP	SP	MSP	MSP	SP
	PP	PP	PS	SP	CPP	CPP	CPP	SP	SP	CPP
Budget	FYF	FYF	CF	FYF	FB	CF	FYF	CF	FYF	FB
	CF	CF	FB	CF	CF	FB	CF	FB	CF	CF
	FB	RF	FYF	RF	FYF	ZBB	IB	ZBB	IB	ZBB
Profitability	CPA	PPA	CPA	PPA	BA	PPA	PPA	BA	PPA	BA
	PPA	RCD	PPA	BA	CPA	CPA	BA	CPA	BA	CPA
	EVC	BA	RCD	RCD	EVC	BA	RCD	PPA	RCD	PPA
Investment	NPV	NPV	NPV	NPV	NPV	P	NPV	P	NPV	P
	P	SA	P	P	NFI	NPV	P	NPV	P	NPV
	NFI	P	SA	IRR	P	PCA	IRR	PCA	IRR	IRR
Performance measurement	PBT	PBT	PBT	PBT	PBT	PBT	PBT	PBT	PBT	PBT
	CFRI	RCE	RCE	CFRI	RCE	CFRI	CFRI	RCE	RCE	CFRI
	RCE	CFRI	EVA	RCE	CFRI	RCE	RCE	CFRI	CFRI	RCE
Performance management	BS	BS	BS	BS	BS	ABM	TPS	ABM	TPS	ABM
	ABM	TPS	TPS	TPS	TPS	TPS	BS	BS	BS	TPS
	TPS	VBM	ABM	VBM	VBM	BS	BPRE	TPS	ABM	BS
Rewards	MIS	EIS	PSS	MIS	MIS	PSS	MIS	PSS	MIS	PSS
	PSS	MIS	MIS	EIS	PSS	MIS	PSS	MIS	PSS	MIS
	EIS	SO	EIS	PSS	EIS	EIS	EIS	EIS	EIS	EIS
Performance reporting	NPMAO	NPMAO	NPMAO	NPMAO	NPMAO	GMFCS	NPMAO	GMFCS	NPMAO	GMFCS
	GMFCS	GMFCS	GMFCS	GMFCS	GMFCS	NPMAO	CVC	NPMAO	CVC	NPMAO
	SCAC	VAR	SCAC	CVC	SCAC	CVC	GMFCS	CVC	GMFCS	CVC
Strategic techniques	SM	SM	SWOT	SM	SM	CA	CA	RM	CA	CA
	CA	CA	CA	CC	CA	SWOT	SWOT	SWOT	RM	SWOT
	SWOT	VCA	SM	CA	SWOT	RM	SM	CA	SWOT	RM

Source: authors' development. Note: top three tools per category and period.

Looking at firm size, it is observed that the organizations of all sizes rely on market sensitive pricing (MSP), CPP, or segmental pricing (SP) pricing tools (Table 4). Micro organizations did not change pricing tools amid the economic downturn of 2014–2018, while medium and large businesses expanded practicing segmental and marketing sensitive pricing in an attempt to react on declining purchasing ability of population and offer affordable pricing solutions to diverse target groups of

customers. Some management accounting tools, however, are more resource intensive compared to pricing, and this may explain the relative reluctance of smaller organizations to implement certain tools. For example, in the pre-recession period, FYF was the most popular budgeting tool overall. As the economic recession expanded, the owners of smaller organizations stressed on personal control of resources and expenditures and thus decreased using budgeting tools.

Table 4. Survey results: size.

Category	2000–2013				2014–2018			
	Micro	Small	Medium	Large	Micro	Small	Medium	Large
Cost	SC	VA	OA	VA	VA	VA	VA	VA
	VA	OA	CJ	OA	OA	OA	OA	SC
	FC	SC	VA	CJ	MC	FC	MC	OA
Price	MSP	MSP	CPP	CPP	MSP	CPP	CPP	CPP
	CPP	CPP	MSP	PS	CPP	MSP	MSP	MSP
	SP	SP	PS	PP	SP	SP	SP	SP
Budget	FYF	FYF	FYF	FYF	CF	CF	FYF	FYF
	RF	CF	CF	CF	FB	FYF	CF	CF
	IB	RF	RF	ZBB	FYF	FB	FB	IB
Profitability	PPA	PPA	PPA	PPA	BA	BA	CPA	CPA
	RCD	RCD	CPA	BA	PPA	PPA	BA	PPA
	BA	BA	RCD	EVC	RCD	CPA	PPA	BA
Investment	NPV	NPV	NPV	NPV	NPV	NPV	NPV	NPV
	P	P	P	SA	P	P	P	P
	IRR	IRR	SA	NFI	PCA	PCA	IRR	SA
Performance measurement	PBT	PBT	PBT	PBT	PBT	PBT	PBT	PBT
	CFRI	CFRI	RCE	RCE	CFRI	CFRI	CFRI	RCE
	RCE	RCE	CFRI	EVA	RCE	RCE	RCE	CFRI
Performance management	TPS	BS	BS	BS	ABM	ABM	BS	BS
	VBM	TPS	BPRE	ABM	TPS	TPS	BPRE	ABM
	ABM	VBM	ABM	BPRE	BPRE	VBM	TPS	BPRE
Rewards	PSS	MIS	MIS	EIS	PSS	PSS	MIS	MIS
	MIS	EIS	PSS	MIS	MIS	MIS	PSS	EIS
	EIS	PSS	SO	SO	EIS	EIS	EIS	PSS
Performance reporting	GMFCS	GMFCS	GMFCS	GMFCS	CVC	CVC	GMFCS	GMFCS
	CVC	CVC	CVC	NPMAO	NPMAO	NPMAO	NPMAO	NPMAO
	NPMAO	NPMAO	NPMAO	VAR	GMFCS	GMFCS	CVC	CVC
Strategic techniques	CA	CA	SM	SM	RM	RM	CA	CA
	SWOT	SWOT	CA	CC	CA	SWOT	SM	RM
	RM	SM	VCA	CA	SWOT	CA	SWOT	SWOT

Source: authors' development. Note: top three tools per category and period.

Profitability category is another case where the recession-induced change is observed as organization size increases. In 2010–2013, there was high overall level of interest in PPA, customer profitability analysis (CPA), and relevant costing for decisions (RCD). In 2014–2018, micro and small organizations hurled all their efforts into ensuring breakeven income, while medium and large ones focused on investigating customer profitability to diversify their offers and adopt pricing schemes to new expectations and purchasing behavior patterns. The smaller–larger difference was also marked in strategic techniques category. Among micro and small organizations, 64% of respondents reported the increased use of risk management tools in the times of recession, while medium and large organizations paid more attention to the detailed analysis of competitors.

Overall, in 2014–2018, both small and large businesses shifted from strategic tools (strategy mapping (SM), core competencies (CC), and value chain analysis (VCA)) to situational measures of management accounting. About 28% of respondents (both small and large) expected the use of risk management (RM) to grow in response to deteriorating economic conditions (Figure 4).

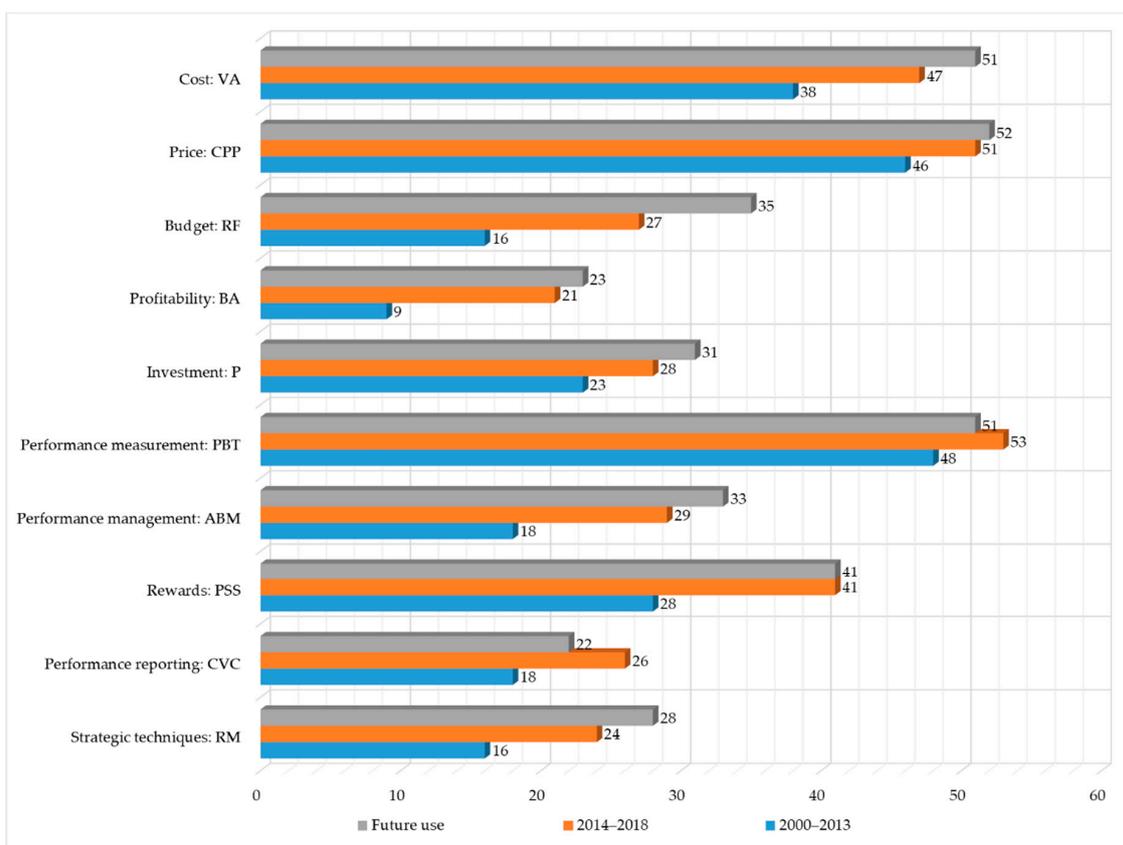


Figure 4. Management accounting tools which organizations intend to adopt in response to the deterioration of economic conditions, percentage of respondents. Source: authors' development.

Along with RM, variance analysis, rolling forecasts, payback, breakeven analysis, and activity-based management were the tools that most respondents intended to use in the next years if the declining trend in the economy continues. It is observable across all sizes of organizations, industry sectors, and territories included in the survey.

5. Discussion

Providing the results of an exploratory study of how accounting can be used to facilitate strategic change, this paper responds to the calls from many authors and organizations regarding the challenges and opportunities of application of management accounting practices in the times of economic downturn. The findings obtained in this paper are generally comparable to those of specialists at the international level. Thus, CIMA [86] shows the increasingly widespread use of management accounting technologies such as rolling forecasts, strategic management accounting, total quality management, balanced scorecard, a model of economic value added, among others. Based on the results of the evaluation of various tools, the most widely used costing tool (production accounting tool) is overhead allocation, as well as variance analysis; they are actively used in the foreign practice of standard costing and full (absorption) costing [86].

Our analysis, however, has revealed that during 2010–2018, the organizations of all sizes, sectors, and types of territories responded to the deterioration of economic situation by changing the management accounting practices. This supports the findings of many studies related to crisis–accounting relationship, particularly, Bangara's [87] view that increase in the volatility of internal and external environments surrounding an organization has an impact on the adoption of management accounting practices, Enderich's [88] assertion that economic crisis represents a crucial driver of management accounting change, Van der Stede's [67] and Edogbanya's [89] appraisal of the

impact of economic recession on control mechanisms and their role in the correction of the effects of economic decline in corporate performance, and Simons' [90] finding that the transformation of strategic priorities in the times of economic uncertainties influences the manner in which accounting controls are used.

Senior and Swailes [91] identified the external environment as the second most important aspect of an organization's environment that might cause change (temporal and internal environment being the first and the third, respectively). In the case of the economic decline in Russia, however, the primacy of external environment in transforming accounting practices has been revealed. It supports the concept of the prevalence of external pressures as the causes of change within organizations in the conditions of crisis discussed by Carruthers [92], Greenwood et al. [93], and Tracey et al. [94]. Busco et al. [95] and Moll and Hoque [96] also reported that changes in the application of MA tools occurred as a response to external sources, such as market pressures and consumer expectations.

In correlation with Siska [97] and Abo-Alazm Mohamed [98] who performed their studies in the cases of the Czech Republic and Egypt, respectively, the analysis demonstrated that in the pre-recession period, Russian organizations predominantly used strategy techniques, such as strategic management, budgeting tools, and decision support systems. Higgins and Coffey [99] also showed that, in the times of economic growth, the companies used SR strategically, while sustainability was embedded into their strategic priorities. In the conditions of economic slowdown, Russian organization have switched to short-term tools which have a direct effect on performance parameters. Limited forward-looking as a reaction to increasing external volatility along with quantitative disclosure of operations to achieve sustainability outcomes have been also disclosed by Stacchezzini et al. [6]. Our study demonstrates that the economic decline in Russia in 2014–2018 increased the importance and usage of short-term planning and the development of yearly budgets for cost controlling, performance evaluation, and planning day-to-day operations. In support of the findings of Stacchezzini et al [6], we found that the majority of respondents did not adhere to long-term solutions amid the volatile external environment, abandoned development of long-term action plans and forecasting, and avoided providing information about their sustainability performance, especially when their economic results were poor. This finding conflicts with the results of the surveys conducted by Bennett et al. [7]. They allowed envisaging the increasing use of sustainability information for planning in daily operations among the number of leading companies in Germany and the UK. In those countries, the tendency towards decision situations which require short-term information can be explained in terms of their implications for conventional management accounting. In Russia, many of SMA and SR measures are still new and therefore are not considered to be applicable in short-term decision making. Pavlatos and Kostakis [5] surveyed the organization in post-crisis Greece and ranked strategy, budgeting techniques, and strategic management accounting tools as the highest in importance. As contrasted to our study, their results demonstrated that during the crisis, strategic and planning tools were used more extensively by companies as compared to the period before the crisis [5]. At the same time, on the contrary, the results of our study support the earlier findings of Pavlatos and Kostakis [5] as they revealed a focus on strategy-oriented practices among Greek companies during the pre-recession period, similar to that identified in Russia.

The lags in changing MA practices from those strategically oriented to short-term ones are supposed to be one of the factors of endogeneity in this study. Li [76] suggested lagged dependent variable as one of the methods to reflect observable and unobservable past information of a firm and in such a way to explain its future performance. Each of the three scenarios of pre-recession, current, and future use of MA instruments considered in our study have an endogeneity problem not only because of the endogenous choice of MA tools for the survey but also because of the reverse causality from economic performance to external volatilities. It is supposed that both past performance and current MA practices may have a positive impact on sustainability. The performance expectations are not reflected, particularly, in the variations in MA responses between the firms that foresee better or worse performance under the influence of economic recession. In terms of the lagged managerial

decisions, the endogeneity problem has been also discussed by Gatchev et al. [100] in the case of financial decisions and Bae et al. [101] and Lemmon et al. [102] in the case of lagged and future leverages. Abdallah et al. [78] suggest that the endogeneity problem may be mitigated by the utilization of system generalized method of moments in the form of lagged differences in organizational behavior. This method may apply to the scenarios we depicted as it relies on a sufficiently long time series and allows for the inclusion of time-invariant binary variables.

Another dimension of the endogeneity problem in this study is that the goals of management accounting in Russia do not necessarily correspond to global trends in accounting. According to the estimations of the respondents, management accounting has received a predominantly fragmentary distribution in Russia (53.8% of respondents confirmed the off-system use of its single instruments), which does not indicate the full functioning of the management accounting system. Some practices, rather commonly used internationally, such as shareholder value analysis and product lifecycle analysis, have gained in importance and usage in Russia neither in the pre-crisis period nor during the crisis. Abdel-Kader and Luther [103] and Chenhall and Langfield-Smith [104] also reported rare use of such tools, but only for pre-crisis periods. The endogeneity increases in the times of economic decline when the managers have to act quickly and choose strategies and tools of accounting without proper investigation of their effects with the expectation that they will ensure better performance and improve sustainability of a firm. This effect, previously studied by Hamilton and Nickerson [105], is evident among the Russian companies in 2014–2018. This may be explained by the fact that the existence of new MA practices is not widely known about and practiced among the accountants' community in Russia. On the contrary, some tools are widely and even increasingly (in the times of a crisis) used in Russia despite their discontinued use in international practice. For example, CIMA [86] recognized payback as an unsuitable mean of investment appraisal, yet its popularity in Russia has been increasing since 2014 despite the availability of other simple alternatives which provide more informative results.

A significant difference is observed in the target of accounting (in Russian practice, conservative views on the purpose of management accounting prevail). As the economy declined in 2014–2018, the main goal for the majority of the organizations was to minimize costs (17%) and control the performance of the organization in short and medium run (13%). This tendency is particularly observed in underperforming territories among small and medium enterprises in service, tourism, and trade sectors. Budgeting is an area where, for example, CIMA [86] suggested that traditional practices had become outdated and thus predicted the emergence of the tendency for budgets to trigger game-playing, budget-padding, and other sub-optimal behavior. Our study, however, demonstrates that, in the conditions of economic uncertainties, businesses avoid a radical re-invention of budgeting and performance management and continue using rolling forecasts, cash forecasts, and financial year forecasts. It is consistent with the results of Pavlatos and Kostakis [5] who demonstrated that those budgeting tools which allowed tighter control, such as budgeting for controlling costs, gained in importance and use during the crisis, and the findings of Hyvonen [106] who considered budgeting techniques as important and widely used by management in cost controlling and planning in the times of progressing economic decline. Dekan [1] also concluded that in the times of economic recession, the companies tended to reduce spending in any discretionary areas to lessen existing cash-flow needs, as well as handled indirect cost during falling production.

Most of the respondents outlined that the current economic situation in Russia might cause additional risk factors that had not existed or did not have a strong influence on the companies in the pre-crisis period. As the economy declines, new emerging threats to sustainable development may include constraints on the availability of capital and credit, concern and liquidity issues, degrading purchasing power of population, high inflation, and volatile markets, which taken together result in significant uncertainty of doing business. Coles et al. [77] examined two measures of risk, which were stock return volatility and cash from volatility, and found that, through financial policy, increasing risk could generate uncertain performance. The idea was supported by Goel and Thakor [107], who provided a model that addressed the relationship between risk-taking, competition, and tournament incentives,

Kini and Williams [108], who revealed the link between risk and internal tournament incentives, and Chen et al. [109], who applied the risk-performance link to competition. The survey demonstrates, that, in the future, the respondents see the greatest increase in demand in risk management, variance and breakeven analysis, and activity-based management. This means that the expectation of continuing economic decline directs the businesses to turn into contemporary MA techniques, as opposed to traditional cost accounting systems. This finding agrees with those from the studies of Scorte et al. [110] and Angelakis et al. [111] who both report an increasing trend for organizations to risk and place greater emphasis on currently developed techniques instead of traditional performance evaluation techniques. According to Coles et al. [77], in determining firm risk, managers face potential costs of reduced expected utility arising from exposure to risk through performance-contingent compensation. Kale et al. [112] suggested that in order to increase the probability of success, the firms set a higher internal promotion-based tournament prize. A convexity in executive compensation can offset the risk exposure and possibly increase the incentive to take risk in changing MA practices among the managers [113,114]. In a volatile environment, a less risk-averse manager inspired by higher competition and tournament incentives will take more risks and potentially earn more through increased option value, which leads to higher performance of a firm but threatens sustainability. In case of Russia, we see that this suggestion complies with a hypothesis of Coles et al. [77] that the usage of financial and accounting policies that increase firm risk will, in turn, distort sustainability, decrease investment in hard assets, and increase the industry gap. Peer groups as substantiated by Bizjak et al. [115], and Faulkender and Yang [116,117] may be used in setting compensation levels for the specialists responsible for management accounting.

In many prior studies, firm size has been employed as an important firm characteristic. Size effect, the relevance of firm size in determining the dependent variables, has been observed by Dang et al. [89], Baker and Hall [118], Coles et al. [119], and Frank and Goyal [120], among others. Vijh and Yang [121] found that the sign and significance of firm performance variables were sensitive to different firm size measures. Our study demonstrated that in Russia, the intention to increase the use of risk management and performance-oriented accounting tools did not diverge across the sectors or firm sizes. We found, however, that small and medium enterprises, in the main, implemented a narrower set of MA tools compared to large companies. Primarily, SMEs used simple MA instruments, such as pricing, and thus were not able to diversify them. Since most of the MA tools are generally rather resource intensive, in the times of economic decline, Russian SMEs have been decreasing using budgeting tools and instead stressing on personal control of resources and expenditures. Similar to our finding, Fiala and Hedija [122] did not detect a clear dependence of performance management and accounting practices on firm size, but Lotti et al. [123] expected that such a link might become valid in the long run, when the economic volatility decreased and markets tend to approach a steady state.

6. Conclusions

In a global context, the emerging volatility of the markets along with the evolution of the regulatory framework have changed the determinants of corporate performance. In this increasingly volatile business context, sustainability management has generated demands for the adaptations of conventional management accounting to serve the resilience-related goals. Prior to and in the times of economic decline, accounting policies of a company are essential for its sustainable performance. In a down economy, the importance of management accounting increases as its major goal is to generate the necessary information about external environment, relaying it to changing the internal one. The primary focus of this paper was to examine whether the change in the business environment, particularly, economic recession, affects the level and set of management accounting tools. Given the relative novelty of sustainability as one of the goals of management accounting in Russia, it was not surprising to find a high level of variety in MA practices among Russian companies. The survey demonstrated that they used a number of tools across a range of operational, managerial, and strategic functions. Although several MA instruments were in use across the sample of surveyed companies,

the range of different methods within each company was usually limited. Both the importance and popularity of particular MA tools varied depending on the external economic factors.

The contribution of this study to the literature involves the understanding of the use of particular MA tools before and during the economic recession. Comparisons were made between management accounting practices used by the organizations differentiated by their size (micro, small, medium, and large), sector (service, industry, trade, agriculture, and tourism), and location (territories of Russia differentiated on the level of their economic performance). Out of 54 management accounting tools, the most popular ones were identified across ten categories (cost, price, budget, profitability, investment, performance measurement, performance management, rewards, performance reporting, and strategic techniques) and three pillars (operation, management, and strategy). The major finding is that both importance and usage of proactive strategy-oriented tools decreased during the crisis, while at the same time the level of importance and usage of less-sophisticated short-term instruments increased as the organization focused on achieving immediate and direct effects on sales, profits, and other performance parameters. The forecast of future application of management accounting tools in the situation of progressing economic decline revealed that organizations of all types and sectors planned to increase the use of such practices as risk management variance analysis, rolling forecasts, payback, breakeven analysis, and activity-based management in response to deteriorating economic conditions.

The survey approach used in this study imposes particular limitations, as well as emerges some directions for future research. Specifically, the contribution to the knowledge about MA–crisis–sustainability relations cannot be achieved through interviews alone. In the volatile environment, it is necessary to study the change within the firms in adopting a SR framework and integrating sustainability issues into short-term planning and operative decision making. The interviews allow the observation of a correlation between economic volatility and MA change but did not contribute to the understanding of what actually drives the change towards improved sustainability performance. The endogeneity problem exists as the study observed a correlation between the external environment and the change in use of MA tools in all three scenarios, but does not explain causality. The role of particular MA tools in facilitating organizational changes in response to the economic crisis has remained underexplored. Further research should, therefore, focus on possible mitigation of endogeneity by using a combination of methods, including lagged independent and control variables (suggested by Li [76]) and system generalized method of moments (transformed by Abdallah et al. [78]). This will allow assessing organizational transformations induced by management accounting and the relative effectiveness of certain accounting practices in responding to external economic fluctuations.

The impacts of ownership, size, and sector on the attitudes of a company to sustainability-oriented use of MA tools might be explored further. The survey format of the study has not allowed us to collect relevant commercially sensitive information on all possible firm size measures in the case of Russian organizations. We, therefore, utilized the open information on the number of employees as a proxy, but the researchers can use some alternative firm size measures such as total assets, total sales, market value of equity, enterprise value, total profits, or net assets. All those proxies can be mechanically correlated with the dependent variables of performance and sustainability, therefore, the empirical sensitivity should be considered.

Due to the fact that this study included the companies from five sectors only, there is an opportunity to extend the research to a wider pool of industries, specifically, to banking (to study the changes in application of MA tools in banks and financial organizations in turbulent financial markets), oil and gas (to see if export-oriented resource companies ever react to the deterioration of the economic situation in the domestic market), and retail (to investigate the MA-related reactions of retailers on degrading purchasing power of population during an economic crisis). It is also worth studying the recession-induced effects of tournament incentives on performance, risks, and sustainable development, specifically, in banks and financial firms, for which Coles et al. [77] earlier reported a statistically significant positive effect of industry tournament incentives on the volatility of cash flows and stock returns. Within the sectors, the selection of incentives and setting of compensation levels for the

managers should be studied based on the peer groups method in the light of relative peer effects, as suggested by Bizjak et al. [115,124] and Faulkender and Yang [116,117]. Understanding how peer groups are established for the purposes of relative performance evaluation is important to understanding the incentives for accounting managers and specialists for changing MA practices in volatile economic environment.

Since the data were collected in Russia, the results of the study may be generalized for the specific pre-crisis and crisis periods in this country only. The study should, therefore, be extended to other countries which either have recently experienced an economic recession (Greece, Portugal, Ireland) or currently have an economic situation similar to that in Russia (Kazakhstan, Ukraine, Argentina, Brazil). Such extension will allow cross-country comparisons. Replicating the study in other sectors apart from service, industry, and trade (finance and banking, retail, or information technologies) could allow extending the research and uncovering cross-sectoral variables which may further enhance the understanding of the role of management accounting in ensuring sustainable development in the times of economic decline.

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