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## COEXISTENCE OF CONTROLLING AND OTHER MANAGEMENT METHODS

The effects of the coexistence of Controlling and other management methods (benchmarking, BPM, BPR, BSC, Competency-based Management, CRM, ERP, KM, LM, Outsourcing, Six Sigma, TQM) have been analysed. The complexity and dynamics of modern management systems in fact require simultaneous and/or sequential application of many concepts and methods of management. Controlling is a comprehensive method with an interdisciplinary character, which acts as an integrating plane for many methods and techniques. The coexistence of controlling with other management methods depends on the type of relationship between controlling and these methods. In the main, however, coexistence should be beneficial for an organization. Theoretical concepts on the relations between controlling and other methods are thus empirically tested by analysing the effect of using selected management methods, both in conjunction with controlling, as well as separately (business, efficiency, management, social and environmental effects). One-Way ANOVA was used based on a sample of 167 Polish organizations.

**Keywords:** *management methods, controlling, coexistence, organizational effects*

### 1. Introduction

In recent years, many research papers focused on controlling, considering it to be one of the most popular support methods in management [7, 13, 35, 44, 52, 54, 61, 82]. Horvath even states that *controlling is currently a task performer in all German companies* [36, p. 16]. The reasons why controlling is so popular can be seen in the benefits which the implementation of this management method can bring. Controlling enables clear determination of the aims to be achieved, as well as fast identification of

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problem areas in an organization [50, 70]. Moreover, it promotes the smooth functioning and development of a company [4, from 18], as well as improving the effectiveness and competitiveness of its functioning [52, 58]. Additionally, controlling allows an organization to achieve economic efficiency (profitability), financial liquidity [27 from 18], and management rationality [82], to limit economic risks, as well as providing employment stability, it also has a positive influence on the quality of the products that an organization offers [65]. Berry et al. emphasize the role of controlling and stresses that accounting is still an important element of controlling because it integrates all aspects of an organization's work into an economic calculus [5]. Weissenberger and Angelkort stress the increasing importance of the role of controllers as business partners which leads to increasing impact of controllership on management decisions [85].

Results of the research show that the management of modern organizations requires applying various concepts and methods [37, 38, 46–49, 74, 76, 77]. According to Lichtarski and Czura, as a result of implementing two or more concepts at the same time, it is possible to achieve synergistic effects which would not be achieved if the concepts were used separately [47]. At the same time, it should be emphasised that the very issue of the coexistence of controlling with other management methods is not often touched upon in the literature on the subject. An exception is presented by Nowak who discusses this issue from a theoretical perspective [56]. However, what can be noticed in the literature, is that there is a need to integrate controlling with other management concepts. For example, Weissenberger and Angelkort note the increased level of integration in the design of accounting systems that leads to an increased quality of output which can be attributed by management to the controller's services [85]. Moreover, Kawalak is of the opinion that benchmarking is essential during the implementation of controlling, as well as in the course of its use in an enterprise [41], while Davis and Albright consider the effectiveness of Balanced Scorecard (BSC) in improving financial performance [23]. The relationship between BSC and controlling is characterised by Weber and Schäffer [84]. Bhimani and Roberts justify the need for integrating management accounting and knowledge management [6].

In this context, a question arises as to which management methods coexist best with controlling. Does such coexistence result in the organization achieving better results as a whole? The aim of the research presented in this paper is thus to understand and explain the results of the coexistence of controlling with other management methods. In order to explore the relationship of controlling with other methods, the authors analysed the differences between the assessments of the outcomes of using selected management methods both paired with controlling and separately. Furthermore, it was assumed that the positive results of implementing controlling in parallel with another management method should be greater than the results of implementing just one of these methods alone. If so, it is possible to talk about synergy from the

parallel implementation of two methods at the same time. The study under discussion constitutes a continuation of the research project presented in [14].

## **2. Literature review**

Controlling, both in the literature and in practice, is most frequently interpreted as a method of supporting management by participation in the processes of planning, controlling and steering by coordinating these processes and by overseeing and monitoring them which enables making the right decisions in an organization [10, 35, 54, 61, 82]<sup>2</sup>. Weber also notes that controlling can be defined as steering support which provides enterprise managers with essential help [82]. According to Nowak, controlling is a modern concept (method) of management which supports managers in making quick and rational decisions by creating a reliable system of analytic information [54].

In this respect, controlling supplements management, it is parallel to managerial processes (covers the tasks performed by controllers, its primary executors) and provides advice. A controller assists managers in decision making at various organizational levels but he does not make decisions on his own [57]. Goliszewski stresses that controlling does not replace management but – by assisting, evaluating and advising – makes management possible [25]. At the same time, Zoni and Merchant claim that most controllers are highly involved in the management decision processes [89].

Thus, controlling should be one of those concepts of management which particularly frequently interacts with other methods. This results, most of all, from the fact that controlling should be regarded as a comprehensive method of an interdisciplinary character, or even as an integrating plane for management methods and techniques [44]. Controlling influences all management functions in an organization. Among direct areas of its interests are planning and control [35, 44, 52, 80, 82] but it also indirectly influences other management functions such as organising (among other things, by adding controllers into traditional management structures, by isolating responsibility centres in such structures) and motivating (by using the concept of remuneration or incentive systems for managerial staff) [12, 58, 59, 82].

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<sup>2</sup>The definition of controlling should be based on the origin of this concept. In the modern understanding of this word, it is accepted that the lexeme controlling comes from the United States where it existed as control-ship and meant the activities performed by controllers. At the same time, it should be highlighted that in the United States, in practice this term covered the activities performed as a part of managerial accounting. Controlling came to Europe after the 2nd World War as a result of establishing branches of American corporations. The authorship of the word “controlling” is ascribed to A. Deyhle, so this term is of German origin. Along with the implementation of controlling in European companies, its evolution towards becoming a method of management support began. However, as present it is widely accepted that there are no differences between the English concept of managerial accounting or management control and the German term – controlling.

It is also worth stating that controlling can support enterprise management at the strategic and operational level [35, 80, 82]. Strategic controlling is connected with strategic management and its principal goal is to support a particular phase of the strategic management decision-making process, especially in terms of strategic planning, strategic control, strategic steering and information of strategic character [60, 44]. The implementation of controlling, on the other hand, supports operational management, so it is helpful during decision-making processes connected with the transformation of strategic plans into operational ones, the implementation of such plans and thus determines the level to which the tasks corresponding to them are executed, and by this, the level to which current aims are achieved (which influences, of course, the achievement of strategic aims) [44].

Controlling solutions are becoming more and more frequently applied to particular functional areas. When considering the vertical functions of an enterprise as a criterion for categorisation, we may list delivery control, production control, marketing control, sales control, as well as research and development control. However, when horizontal functions are used as the criterion for categorization, we may highlight finance control, investment control, quality control, venture control, as well as personnel and logistic control [11, 55, 71]. The concepts of controlling leads to the fact that, as well as performing assigned tasks in particular functional areas of an organization, it also considers the management methods used there and is now using the instruments so far reserved for those methods more and more frequently. Controlling does not have its own instruments, but it adjusts and adapts existing tools for its own needs, so that the tasks assigned to controlling are performed effectively and efficiently.

The comprehensiveness of controlling indicated above leads to the fact that this concept is *de facto* made to coexist with other management methods.

Generally speaking, the complexity and dynamics of modern management systems in fact demand the application of a number of concepts and methods of management – sometimes simultaneously and sometimes sequentially [37, 38, 46–49, 74, 76, 77]. What is emphasised most, is that managing an enterprise in a changing and less and less predictable environment requires using diversified concepts and methods of management – those which will guarantee the smooth functioning of an enterprise (e.g. controlling), as well as those which will support the introduction of changes (e.g. business process reengineering), specialised management methods that address specific managerial problems (e.g. personnel controlling) and those which respond to problems of integration (e.g. benchmarking, business process management). What is also observed, is the increasing “supply” of new concepts and methods of management – their sources are consultancy companies, scientific and training centres, specialist press and outstanding experts on management: professors, consultants and managers [30, 37, 40, 69]. On the other hand, we also encounter a peculiar, partially justified, “sucking in” of these concepts by managers, not resulting from the needs of an enterprise but caused by fashion [37].

Karsten assumed that even if the academic value of a management concept could not be proven, those of merit result in an increase in productivity, efficiency and/or profitability [40]. As in the case of the coexistence of methods – the analysis of the relationships between methods is an extremely interesting, topical and difficult research problem which can be analysed in many different ways. However, in the present study, the authors have concentrated on the perspective of the effects of the joint use of selected management methods, and these methods will be analysed and the relations which hold among them will be assessed in such a context.

In this paper, it is assumed that the relationships between methods can have one of the following characters: complementary, contradictory, substitution or incomparable [37, 38, 47, 49, 76]. The complementariness of methods means that methods or their elements complement each other, so that they create a logical whole. A condition for the complementariness of methods is that some of their aims and assumptions are aligned. The areas of interaction, techniques, tools and instruments used, as well as the weak and strong points of the methods, can – but do not have to – be aligned. It is also assumed that complementary methods can be equivalent to one another when they both mutually fulfil organizational aims (a synergistic effect), or when one of the methods can be superordinate to the other, and then the subordinate method is an instrument of the superordinate one used to achieve specific goals. The substitutability of methods means that they constitute alternatives from the perspective of particular organizational aims. The simultaneous use of substitutable methods can in fact positively influence the achievement of a narrow group of organizational aims (to a rather insignificant degree), but will lead to a decline in other organizational results (the application of such methods is costly and organizationally more difficult). The concept of contradictory methods implies that the assumptions, objectives, key principles or manners of conduct of these methods are mutually exclusive, so their simultaneous use is counter-effective. Finally, incomparable methods have no clear connection and they pertain to different goals and/or influence different areas of the functioning of an enterprise, so that the results of their coexistence should be the sum of the results achieved by the particular methods on their own (i.e. there is no synergy effect).

One challenge was the selection of suitable methods in order to analyse their relationship with controlling. Without going into detail about the differences and similarities between such terms as method, technique, concept, system or approach, it was assumed, as in Hopej and Kral [34], that they are instruments in the manager's hands used to facilitate solving management issues. More specifically, the selection of these methods was based on two main criteria: their usefulness in management practice and efficacy according to current trends in science [34]. The study concentrated on the following 13 selected contemporary methods of management: balanced scorecard (BSC), benchmarking, business process management (BPM), business process reengineering (BPR), Competency-based management, controlling, customer relationship management (CRM), enterprise resource planning (ERP), knowledge

management (KM), lean management (LM), outsourcing, six sigma and total quality management (TQM).

Based on this selection, the authors defined and analysed the common plane of controlling and the other management methods analysed in the research – their goals, key assumptions, principles and elements, areas of interaction, the techniques and tools used, as well as their strong and weak points. The aim of the analysis was not to characterise particular management methods – this would be neither possible (because of the size of the study) nor qualitatively new. The aim was to determine the character of the relation between controlling and the other methods in the light of current theory.

### **2.1. Controlling and balanced scorecard**

In discussing the relation between balanced scorecard (BSC) [39] and controlling, we should stress that, on the one hand, BSC arose out of the need to improve the measurement functions of management accounting in planning, control and performance [23]. On the other hand, however, it is shown in the literature to be an essential controlling device [51], management accounting technique [86] or tool of strategic control [52]. Sierpińska and Niedbała call BSC the missing chain of budgeting [71]. When oriented towards the economic perspective, strategic control is de facto made to perceive other parameters determining the success of the organization as a whole (i.e. a customer's perspective, the perspective of internal processes, as well as the perspective of development and learning). The area in which these methods converge is their strong orientation towards goals and the future, both methods are important for strategic management decision making. With reference to controlling, Reichmann notes that it is not possible to design control targets independently of understanding a company's main goals [68]. BSC – in the opinion of Kaplan and Norton – puts strategy (so strategic goals as well) – not control – at the centre [39]. The relationship between BSC and controlling is also characterised by Weber and Schäffer [84].

### **2.2. Controlling and benchmarking**

Benchmarking is essential in the implementation of controlling, as well as in the course of its use in an enterprise [41]. Benchmarking provides a comparison of results, processes and methods [87], thus during the implementation of controlling, it supports the selection of appropriate controlling solutions. Benchmarking is a structured process which facilitates the improvement of current organizational standards by adopting superior practices [53], so when applied together with controlling, it gives information as to the appropriateness of the correctional and/or preventional activities offered within the field of controlling. Like controlling, benchmarking aims to improve and

streamline the organization as a whole, or its components [82]. However, it should be remembered that controlling uses an extremely rich range of instruments and benchmarking is one of many tools.

### **2.3. Controlling and business process management**

The literature on this topic stresses the holistic character of the business process management (BPM), defining it as a method of organizational improvement, determining the effectiveness of an organization [63, 79]. In this context, BPM should be regarded as a comprehensive method – like controlling. From the perspective of an organization's effectiveness, it is important to use both methods at the same time. The management of an organization's processes requires the control of these processes from a financial perspective [45], while the use of controlling requires taking steps towards optimising the organization's processes. This is essential because controlling – in its essence – accentuates the need to recognise and analyse the processes within an organization, as well as reorganising it, so that the processes occurring within an enterprise, as well as in its environment, can – from the very beginning – proceed smoothly [80]. An orientation towards processes is more and more frequently given as a feature of controlling. Balon and Boratyńska-Sala also point to the possibility (or even the necessity) of using the process approach in controlling [3], while Zur Muehlen characterises the issue of process controlling [90].

### **2.4. Controlling and business process reengineering**

One of the assumptions regarding the implementation of controlling in an organization which is a condition for its effective implementation, is making changes in the organization as required by the needs and requirements of the management support method under discussion [80]. In this context, the business process reengineering (BPR) can be regarded as an important tool in the process of implementing controlling. On the other hand, in the case of soft BPR [33], controlling can be used as a tool providing information enabling the optimisation of processes (in terms of their effectiveness). As observed by Czerny, the information from an accounting system can be used in the processes of reorganization [20]. The information from retrospective and prospective financial analyses, which is one of the bases for evaluating an enterprise's condition and preparing reorganization schemes, plays a leading role in the identification of reorganization needs. Both methods thus concentrate on the area of changes. The difference between these methods is the fact that BPR (with the exception of the soft BPR variant) is – according to Hammer and Champy – a fundamental re-thinking and radical re-design of processes within an organization leading to a significant improvement in the results achieved [28], whereas future-oriented controlling in the pro-

cess of steering analyses deviations from plans and works out the appropriate correctional and/or preventional decisions, whose aim is to achieve the previously planned targets in the organization [10]. In such a context, these two methods should be regarded as mutually supportive.

### **2.5. Controlling and competency-based management**

Competency-based management is a rather narrow method in terms of its area of influence, because it refers to the sphere of human resources management [62]. Nowosielski suggests that developing incentive systems for managerial staff in order to increase their feeling of responsibility for the firm's results is a key element of the success of controlling [59]. Busco, Riccaboni and Scapens emphasize that management accounting systems (MAS) can be implemented in processes of (un)learning and culture change [17]. This, however, does not imply the need to use solutions from competency-based management. In addition, like controlling, competency-based management can improve organizational performance [31]. Both methods aim at improving the efficiency of activities. However, in the case of Competency-based Management, improvement in efficiency refers to a single employee [8, 9] who – in spite of the above comments – is still not at the centre of the direct interests of controlling.

### **2.6. Controlling and customer relationship management**

Customer relationship management (CRM) is a method used in the conscious management of customer relations and building a loyal group of customers [19]. The goal of CRM is thus cooperation with customers, with the intention of building permanent relations with them. Among the major components of CRM is a strong orientation towards customers (cf. [72]), whereas controlling is oriented towards increasing efficiency and, in practice, it is often imputed to have a very weak orientation towards customers [83]. However, in theory, the orientation towards market and customers is more and more often listed as one of the characteristics of controlling [80]. From the perspective of an organization, the use of both methods can help to combine pro-market and pro-efficiency orientations. Lichtarski observes that orientation towards customers should be accompanied by a controlling orientation towards financial results [46]. However, so far it has been difficult to see any clear connections between controlling and CRM.

### **2.7. Controlling and enterprise resource planning**

Among the assumptions for implementing the enterprise resource planning (ERP) in enterprises are, above all, increasing transparency and the relevance of information,

as well as the integration of the information resources from various functional areas of an enterprise [1, 2, 29]. Thus, the ERP can constitute an important tool of controlling, contributing to greater efficiency in its implementation (e.g. by improving information security and the decision-making process), especially due to the fact that these systems are useful in supporting the processes of planning, control and steering (as well as carrying out the analysis of deviations from plans) in an enterprise [42].

## **2.8. Controlling and knowledge management**

Broadly comprehended, the knowledge management (KM) contributes – like controlling – to increasing an enterprise's competitive advantage [70, 88]. The key aims of KM are: limiting the leakage of knowledge from the organization, limiting the duplication of knowledge, creating knowledge capital at various levels of the organization, both in teams and units, training organizational knowledge teams to use the knowledge resources in its environment, as well as increasing the value of intellectual capital [81, see 22, 26, 64, 78]. KM should result in the representatives of managerial staff considering that knowledge is a key type of the organization's resources [67]. From such a perspective, it is difficult to talk about the clear relations between controlling and KM, although, as claimed by Bhimani and Roberts, management accounting seeks to abet knowledge creation across different organizational spheres and owing to this, it will be increasingly judged in terms of its impact on KM activities [6]. Of course, both of these methods contribute to streamlining the information flow in an organization and increasing the efficiency of the decision-making process, as well as increasing the firm's competitive advantage. Nevertheless, it is difficult to find any areas of interaction.

## **2.9. Controlling and lean management**

Lean management (LM) and controlling are methods which share some very essential assumptions. Above all, both methods are based on the philosophy of continuous improvement. Moreover, they are both based on a participatory style of management (they transfer the rights and responsibility for work to executive employees) and use team structures. In the case of controlling, the democratic and team styles of management are supported by the implementation of selected management techniques (e.g. management via goals, delegation of authority, motivation) and constitute the primary prerequisite for its implementation in an organization [80]. Of course, these methods treat certain issues in separate ways. For example, according to Hopej and Ciurla [32], within the LM feedback is treated as the basic instrument for steering and controlling tasks, whereas controlling, as claimed by Volmuth, concentrates on progressive feed-

back, treating it as the basis for preparing programmes preventing the emergence of possible deviations from the plans of an organization [80]. Controlling can thus constitute a tool supporting LM in the reduction of costs and in the decision-making process, providing the perspective of effectiveness.

### **2.10. Controlling and outsourcing**

The goal of outsourcing, like the goal of controlling, is predominantly to lower the costs of an organization's functioning and focus on the key areas of activity [43, 66, 80]. Controlling can essentially support the process of defining the possibilities of outsourcing (it gives a basis for making decisions related to outsourcing) by providing economic data, as well as by establishing responsibility centres (which – with time – can be transformed into independent units). At the same time, controlling may need Outsourcing in cases where there is a need to reorganise an enterprise. Such a situation can occur both in the process of implementing controlling, as well as during its functioning. This highlights the complementariness of these two methods.

### **2.11. Controlling and six sigma**

On the one hand, according to Smith, Blakeslee and Koonce [73, see 41], six sigma can help, among other things, in the system of controlling Systems in the processes of formulating, integrating and realising new (or existing) strategies and missions, in aligning the changes introduced by a controller with customer expectation, in hastening the activities connected with the integration of particular responsibility centres, increasing innovativeness and improving risk management. At the same time, according to Eckes [24, see 41], six sigma supports the achievement of the targets set within controlling that is, increasing income, profits, customer satisfaction, the enterprise's value and employee satisfaction. On the other hand, however, six sigma is oriented towards a radical improvement of financial results thanks to the planning and control of the course of work. Likewise, controlling is focused on improving financial results (especially achieving economic effectiveness (profitability) and financial liquidity). Both of these methods thus attempt to achieve similar goals by using different solutions.

### **2.12. Controlling and total quality management**

Like controlling, the total quality management (TQM) should be regarded as a comprehensive method, influencing all spheres of an enterprise's functioning. It

aims at achieving customer satisfaction, providing the enterprise with long-term success and bringing benefits to the members of the organization and society [75]. TQM can provide significant support to controlling, since it implements principles which contribute to achieving goals and performing the tasks of controlling: developing the involvement of all employees in achieving the enterprise's goals as a whole, a process-based approach, fact-based decision making (based on collecting data and analysing information), as well as – or perhaps above all – the necessity of continually improving an organization [21]. Controlling fills in the gap in the TQM method related to comprehensive solutions taking into consideration reliable and impartial economic factors (also referring to the costs of providing quality). The goals common to both concepts in the form of constant improvement, as well as the complementariness of these solutions, suggests their coexistence leads to synergy.

As a result of the theoretical analysis of the relations between controlling and other management methods, no method which would be contradictory to controlling was identified. The great majority of the methods were defined to be complementary to controlling. Table 1 is a synthetic summary of the discussion of the character of the relationship between controlling and the remaining management methods.

Table 1. Relationship between controlling and other methods

Type of relationship	Method
Complementary methods to controlling: controlling is superordinate to these methods	balanced scorecard benchmarking enterprise resource planning
Complementary methods to controlling: mutually supportive in fulfilling organizational aims	business process management business process reengineering total quality management outsourcing
Complementary methods: controlling is subordinate to this method	lean management
Methods without any clear relationship with controlling	competency-based management customer relationship management knowledge management
Substitutive methods to controlling	six sigma (alternative in the area connected with control of the course of work from a cost perspective)

It is therefore possible to put forward the following hypotheses with reference to the coexistence of controlling with the other management methods considered:

H\_A1: The coexistence of controlling with BSC, benchmarking or ERP (complementary methods, where controlling is superordinate to these methods) leads to more positive effects than the use of controlling alone.

H\_A2: The coexistence of controlling with BPM, BPR, TQM or outsourcing (complementary methods, where the methods mutually support one another in achieving organizational goals) contributes to more positive effects than by using these methods alone.

H\_A3: The coexistence of controlling with LM (complementary methods, controlling supports LM) leads to more positive effects than the implementation of LM without controlling.

H\_B: The coexistence of controlling with CRM, KM or competency-based management (methods without any clear relationship to controlling) has no impact on the organizational effects.

H\_C: The coexistence of controlling with six sigma (substitutive methods) leads to worse effects compared to the implementation of either method alone.

### 3. Empirical research

The results of the study presented in this paper are part of the complex empirical research regarding modern management methods carried out by the Department of Marketing and Management Systems of the Institute of Organization and Management at the Wrocław University of Technology in 2009. The aim of the study was defined very broadly. Firstly, the study explored the use of management methods in Poland in general and for various groups of organizations (differentiated according to size, profile and the location of their headquarters). Secondly, the reasons for implementing management methods, barriers to their implementation and their impact on organizational effectiveness were investigated. Finally, the coexistence of management methods was examined [14].

The research tool was a questionnaire. 18 experts – scholars researching the selected management concepts and methods, consultants implementing these concepts and methods, as well as managers who use them in their managerial practice – were involved in designing the questionnaire. The questionnaire was addressed to enterprises functioning in Poland. The selection of these organizations was of a target-based character. We looked for organizations which used one or more of the management concepts or methods under analysis and – at the same time – represented different types of activity, sizes and forms of ownership. Only one survey was conducted in each company, anonymously. The questionnaire was filled in by employees who have a broad view of the whole enterprise. As a result of these research activities, a sample containing 167 correctly filled in questionnaires was accepted [14]. However, this sample is not representative. The structure of the enterprises studied in terms of selected characteristics is presented in Table 2.

Table 2. Structure of the enterprises studied in terms of selected characteristics

Item	Number of organizations	Percentage of organizations [%]
Type of activity:		
production	63	38
service	54	33
production-service	37	22
commercial	13	7
Size of organization (number of people):		
up to 50	44	26
51–250	53	32
251–500	33	20
above 500	37	22
Headquarters' location:		
in Poland	139	83
abroad	28	17
total	167	100

In order to test the hypotheses about the organizational effects of the coexistence of controlling with the other selected management methods, the analysis of variance was performed. One-way ANOVA was used to determine whether organizational effects depend on using a pair of management methods (controlling and another of the selected methods), single method, or no method at all. The Tukey Post Hoc test was used for multiple comparisons.

### 3.1. The coexistence of controlling with other management methods

The use of each management method was assessed by a manager on the zero-one scale (i.e. is the method implemented in the organization or not?). It should be noted that there are significant differences in the frequencies of companies declaring the use of different methods. The number of enterprises that have implemented the particular management methods is presented in Fig. 1.

Controlling was the most frequently used method in the organizations studied. The use of controlling was declared in as many as 80 enterprises under analysis, which amounted to almost 48% of the respondents. Table 3 presents the structure of the enterprises that declared the implementation of controlling.

Statistical analysis (cross-tabulations were applied, together with the chi-squared test for independence using a significance level of 5%) shows that: the larger an organization, the more likely to use controlling it is, use of controlling is significantly more frequently indicated by organizations with headquarters located outside the terri-

tory of Poland, there are no statistically significant differences connected with the use of controlling in production, service and commercial organizations.

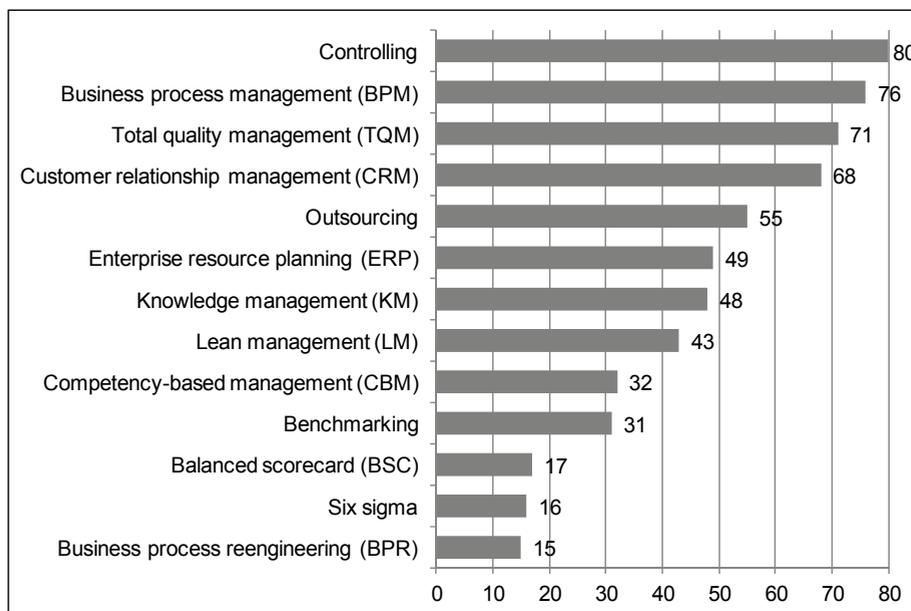


Fig. 1. The number of enterprises which have implemented particular management methods [16]

Table 3. Structure of the analysed enterprises using controlling in terms of selected characteristics

Item	Number of organizations using controlling
Type of activity	
production ( $N = 63$ )	35
service ( $N = 54$ )	27
production-service ( $N = 37$ )	14
commercial ( $N = 13$ )	4
Size of organization (number of people)	
up to 50 ( $N = 44$ )	11
51–250 ( $N = 53$ )	22
251–500 ( $N = 33$ )	21
over 500 ( $N = 37$ )	26
Headquarters' location	
in Poland ( $N = 140$ )	61
abroad ( $N = 27$ )	19
total ( $N = 167$ )	80

In the enterprises under study, controlling occurred only three times as an independent method of management. So, in the vast majority of cases, it coexisted with other methods. In the group of enterprises using controlling, on average the use of five methods was declared. However, 28 enterprises declared that they used from 1 to 3 management methods.

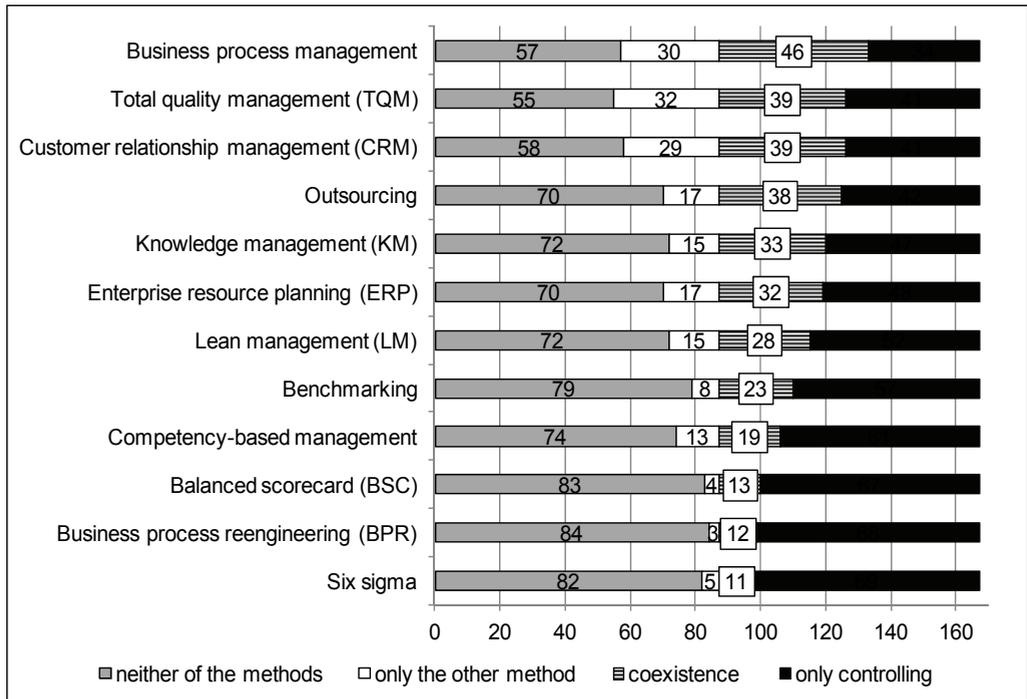


Fig 2. The coexistence of controlling with particular management methods

Figure 2 shows how often controlling was used with other methods (analysed in pairs) in the organizations surveyed. The phrase “neither of the methods” means organizations in which neither controlling nor any other method in the appropriate pair was used. At the same time, the authors did not examine what other methods (those not listed above) were used in the companies studied. The phrase “only controlling” means that in the pair of methods considered, only controlling was used, whereas the phrase “only the other method” indicates the use of only the other method (not controlling) in the appropriate pair. Finally, the word “coexistence” means organizations in which both methods in the appropriate pair (including controlling) were used at the same time. When analysing the effect of a given pair of management methods, the authors did not consider what other methods, apart from this pair, were used in those enterprises.

To analyse the coexistence of controlling with other methods in pairs, it is not sufficient to comment in Fig. 2. The major difficulty here is the difference in the number of firms in which particular methods are applied. This fact affects the “potential” possibilities of the coexistence of these methods. Attempt to answer the question of whether there are methods with which controlling coexists significantly more often than it exists without them requires using, for example, cross tabulations and chi-squared statistics (but the results are still greatly influenced by the number of particular methods) or other indicators, like the average percentage ratio. This kind of analysis is quite complex, but not required to test the hypotheses in this paper. However, it should be noted that controlling coexists with all of the methods investigated.

### 3.2. The effects of the coexistence of controlling with other management methods

The research team consisting of 18 experts in the management methods studied listed 39 effects of the implementation of a management method<sup>3</sup>. Exploratory factor analysis was used to group these effects<sup>4</sup>. Five groups of organizational effects were determined: business, efficiency, management, social and environmental effects. The components of each group, together with the internal consistency factor (measured by Cronbach’s  $\alpha$  parameter), are listed in Table 4.

Table 4. Components for each group of the organizational effects ( $N = 167$ ). Source: [15]

Effects	$\alpha$
Business effects	0.818
general improvement in the financial results of an organization	
improving profitability and an organization’s management effectiveness	
improving financial liquidity	
increasing revenues	
guaranteeing conditions for the long-term existence of an organization	
eliminating “bottlenecks” and barriers in enterprise development	
increasing the speed of capital turnover in an organization	
improving an organization’s adaptation to changes in the environment	
reducing business risk	
more effective achievement of organizational goals	

<sup>3</sup> Each result was evaluated on Likert’s scale of 1 to 5 (from “very negative” to “very positive”) by respondents.

<sup>4</sup> Exploratory Factor Analysis was conducted using the principal components method using SPSS for Windows. The Promax method was used to rotate the factor scores. Due to the shape of the scree plot and interpretability of the solution, a solution with five factors was chosen. 4 of the 39 effects did not form a consistent scale with any of the specified factors, so they are not described.

Effects	$\alpha$
Efficiency effects increasing organizational productivity increasing the quality of products improving the storage system, including decreasing the stock level improving the rate of satisfying production orders on time decreasing the development time of new products implementing more ecologically friendly technologies more effective and rational management of organizational resources decreasing functioning costs, decreasing prodigality in the enterprise increasing work productivity	0.822
Social effects increasing employees' motivation improving the satisfaction of employees improving the innovation and creativity of employees improving workplace involvement improving the competences of employees	0.802
Management effects improving task coordination in management more appropriate decision-making in the process of organizational management reducing the time involved in decision-making improving the division of competence and responsibility at various levels of management improving the information flow in an organization providing various levels of management with additional multidimensional information necessary in enterprise management improving the integration of employees and the cooperation between different organizational units	0.762
Environmental effects improving communication between an organization and its environment increasing the synergy effect in cooperation with customers and/or business partners increasing customer satisfaction improving relations with suppliers	0.673

Before testing the research hypotheses, it was investigated whether there were any differences in the assessment of organizational effects between organizations which implemented controlling and those that did not. The *t*-test for independent samples was conducted (Table 5 shows the results). In organizations where controlling was implemented, the business and efficiency effects were evaluated as being significantly positive.

According to the results of the analysis of variance, these groups of effects (business and efficiency effects) were rated even more positively when controlling was implemented together with some other management methods. The coexistence of controlling and other methods also enabled – in some cases – achievement of better management effects. There were no significant differences in terms of social effects or those associated with the relations between the organization and its environment.

However, it should be noted that the use of controlling together with any other method never leads to a more negative assessment of effects. All of the statistically significant relations between the coexistence of controlling with selected management methods and organizational effects are listed in the Appendix.

Table 5. Differences in the assessment of organizational effects between organizations using controlling and organizations not implementing controlling (the *t*-statistic was used)

Effects	controlling <sup>1</sup>		<i>t</i> -Statistics	Significance level	Measure of effect size <sup>2</sup>
	implemented	not implemented			
Business effects	<i>M</i> = 3.82 <i>SD</i> = 0.44	<i>M</i> = 3.61 <i>SD</i> = 0.38	<i>t</i> (153) = -3.26	<i>p</i> < 0.01	<i>g</i> = 0.524
Efficiency effects	<i>M</i> = 3.82 <i>SD</i> = 0.49	<i>M</i> = 3.62 <i>SD</i> = 0.51	<i>t</i> (156) = -2.57	<i>p</i> < 0.05	<i>g</i> = 0.409

<sup>1</sup>*M* – mean, *SD* – standard deviation.

<sup>2</sup>Hedges' *g* statistics was used (the effect size of 0.2 is a small one, the effect size of 0.5 is a medium one, and that of 0.8 is a large effect, *g* can take values greater than 1).

The business results were rated significantly more positively when controlling was used together with: ERP, BPM, benchmarking, BPR or BSC than when it was implemented without these methods. In the cases of ERP, BPM and TQM, it was also true that in the organizations where these methods were implemented without controlling, the business results were significantly more negative compared to the organizations where ERP, BPM or TQM coexisted with controlling. Each pair of methods significantly contributed to better business results compared to the situation of the absence of both methods.

The efficiency results were assessed significantly more positively by the respondents in the organizations in which controlling coexisted with LM, TQM, benchmarking, outsourcing, six sigma or BSC in comparison to organizations which did not implement either of these methods. Implementing controlling together with TQM led to better efficiency results than implementing either of these two methods (controlling or TQM) individually. The use of BPM together with controlling gave significantly better efficiency effects than using only BPM.

The management effects were better when controlling was applied with KM, competency-based management or six sigma than when no method was implemented. Controlling used together with competency-based management contributes to significantly more positive management effects than when controlling is implemented individually.

### 3.3. The testing of hypotheses

The hypotheses are tested using the analysis of variance. This is summarized in Table 6.

Table 6. Summary of the testing of the research hypotheses

Method	Conclusion	
H_A1: Coexistence of controlling with BSC, benchmarking or ERP (complementary methods where controlling is superordinate to these methods) leads to more positive effects than the use of controlling alone		
BSC	the business effects are better when the pair of methods is implemented than when controlling is used alone	hypothesis is accepted
Benchmarking		
ERP	the business effects are better for the pair of methods than for either method used separately.	hypothesis is partially accepted; the results show that controlling and ERP are mutually supportive.
H_A2: The coexistence of controlling with BPM, BPR, TQM or Outsourcing (complementary methods, where the methods mutually support one another in achieving organizational goals) contributes to better effects than using these methods alone		
BPR	the business effects are better for the pair of methods than for controlling alone	hypothesis is partially accepted; the results show that BPR supports controlling but not vice versa
BPM	the business effects are better for the pair of methods than for either method used separately; the efficiency effects are better when the pair of methods is implemented than when BPM is used alone	hypothesis is accepted
TQM	business effects are better when the pair of methods is implemented than when TQM is used alone; the efficiency effects are better for the pair of methods than for either method used separately.	
Outsourcing	no differences significant statistically	hypothesis is rejected; the findings show that controlling and outsourcing are incomparable
H_A3: The coexistence of controlling with LM (complementary methods, controlling supports LM) leads to more positive effects than the implementation of LM without controlling		
LM	no differences significant statistically	hypothesis is rejected according to the results, controlling and LM are incomparable methods
H_B: The coexistence of controlling with CRM, KM or Competency-based Management (methods without any clear relationship) has no impact on organizational effects		
CRM	no differences significant statistically	hypothesis is accepted
KM		
Competency-Based Management	management effects are better or the pair of methods than for controlling alone	hypothesis is rejected; the results show that CBM supports controlling.
H_C: The coexistence of controlling and six sigma (substitutive methods) leads to more negative effects compared to the implementation of either method alone.		
Six Sigma	no differences significant statistically	hypothesis is rejected; six sigma and controlling are incomparable methods

## 4. Discussion and conclusions

The relationship of controlling with other management methods has been analysed and important input about the type of relationships between the methods studied was given. Several relationships between controlling and other methods described in the literature have been confirmed. This applies in particular to the relationship of controlling with BPM. These methods together lead to more positive business effects than either method used separately and to better efficiency results than BPM used alone.

The ERP, BSC and benchmarking methods are regarded in the literature important tools supporting the implementation of controlling (they are, so to speak, subordinate to controlling). This view has been confirmed in relation to BSC and benchmarking. However, in particular, the research shows a positive synergy between ERP and controlling in relation to general business effects. This means that these methods are complementary and mutually supportive.

In the case of controlling and TQM, although conclusions from the literature are not unequivocal, in this study it was assumed that these methods are complementary. This view has been confirmed in the case of efficiency effects and it has also been shown that using TQM with controlling leads to improved business effects as compared to the situation of applying TQM without controlling.

Theoretical considerations indicate the complementariness of LM and controlling. However, analysis of the effects of using these two methods together does not suggest that any additional benefits result from their coexistence.

In the cases of CRM and KM, the results should be deemed interesting. Most of all, the literature shows that these methods do not have a clear connection with controlling. Their use together with controlling – in the light of our empirical research – does not contribute to improvement in any of the groups of effects. As regards CRM, the analysis also shows that this method should be considered as complementary to controlling in achieving organizational goals. With reference to KM, the results indicate the subordination of KM to controlling, which is very surprising.

The result indicating that the coexistence of controlling with Competency-based Management enables the achievement of better managerial results than by using controlling alone is interesting. From such a perspective, it should be recommended that the possibility of jointly implementing both methods in an organization be considered. Deeper theoretical studies into the relationship between these methods should also be carried out.

The results confirm that controlling and six sigma are methods which should not be (and are not commonly) used together. However, their joint implementation does not lead to worse outcomes – their combination is neither beneficial nor harmful to an organization.

## 5. Limitations and future research directions

The investigation presented in this paper exhibits some limitations that should be considered. First, the paper attempts to compare methods with various scopes and ranges of application. However, the authors did not make any distinction between such phenomena as philosophy, approach, concept, method or technique<sup>5</sup>. Although this issue is extremely important (also in the process of drawing conclusions from this study), it is still quite difficult to unambiguously classify controlling as a “concept” or “method” [48, 74, 77]. The reasons for this state of affairs could be of a purely methodological character and concern differences between the understanding of the terms “management concept” and “management methods” and the vague criteria of defining activities as “concepts” [74, 77]. This may also result from differences in the understanding of the essence of particular methods/concepts and their properties, or from the dissimilarity of the forms in which methods/concepts are used in different countries, sectors or particular organizations, as well as from the changeability of the properties of methods/concepts over the course of time. An explicit classification is additionally hindered by the fact that management concepts and methods permeate one another. The orientations of management concepts are typical of many different concepts (for example, the process approach is explicitly fundamental to process management, however, it is also a key feature of other concepts, such as TQM or LM) and particular methods, techniques and tools can be successfully used based on many different concepts<sup>6</sup>.

*The limitation of drawing scientific conclusions also results from the fact that the research has been conducted on the basis of the comparison of only pairs of selected methods, without taking into account the influence of other management methods used in the analysed companies (nor was the order of implementation analysed)*<sup>7</sup>. What would be extremely valuable is an analysis which would consider the relationship of a bigger number of methods. This is also a great scientific challenge (such an extension of the study presented would require examining as many as 78 pairs of methods). Case studies of given enterprises which make use of several different management concepts and methods could be used as an alternative, or supplement, to such research.

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<sup>5</sup>We appreciate comments from an anonymous ORD reviewer regarding this important limitation of the work.

<sup>6</sup>Szpitter indicates that *various methods and techniques can be used by two different management concepts* [77, p. 11]. Lichtarski presents a different point of view, according to him (...) *contemporary management concepts are more similar to each other at the level of general assumptions and orientations than at the level of tools used within them. (...) The tools used within individual solutions are in fact something quite different qualitatively and they determine the individual nature of each concept* [46, p. 15–16].

<sup>7</sup>We would like to thank an anonymous ORD reviewer for comments regarding this important limitation of the work.

Furthermore, a separate problem is the manner of determining coexistence. The authors of this study realise that the research method used here may raise controversies. With reference to the analysis of the scope of the application of particular methods in pairs, the authors pay attention to the susceptibility of interpretation to the undesirable influence of the variation in the numbers of particular concepts and methods applied in the firms studied. This indicates the complexity and great difficulty of the problem under analysis. However, it also creates the opportunity to carry out more thorough research in this area, whose goals are, among other things, to test the assumptions adopted in the research procedure.

From the methodological point of view, the sample and context are an issue. The study has been conducted in a specific national context – among organizations operating in Poland. The sample is not a representative one, thus the results of the research cannot be generalized to Poland as a target population. Further studies should be based on a representative sample of the enterprises functioning in Poland (or – more broadly – in Europe) paying attention to a different level and scope of implementation of the concepts and methods studied, as well as the context of many situational factors. However, even if we accept that the relationships found in this research are not proven, the results of the study are evidence of their existence.

The issues presented in the paper should be treated as an introduction to the discussion of the coexistence of controlling with other management methods. The following seem to be particularly important: the choice of a set of methods to study, to determine the influence of the implementation of particular management methods on the efficiency of controlling itself and to define model solutions in this respect. At the same time, more attention should be paid to the issue of the coexistence of contemporary management methods from a general perspective and, in particular, to the issue of determining the character of the relationships between particular pairs of methods, as well as examining the order and scope of implementing methods. Other problems which need further investigation are changes in relationships over time, indicating complementary methods, consideration of their possible hierarchisation, the order of implementation, the possibility of substituting other methods (some methods can be better adapted to the solutions existing in an organization or to its organizational culture than others), the clear indication of methods which can really be considered to be contradictory and how the character of relationships changes with time.

## Appendix

Results of One-Way ANOVA: the coexistence of controlling with selected management methods and organizational effects (only significant mean differences are included)

Effects		<i>N</i>	<i>M</i>	<i>SD</i>	<i>p</i> -value <sup>1</sup>	<i>F</i> statistic
Business effects						
Controlling & Benchmarking	no method	72	3.61	0.37	0.000	$F(3,151) = 6.95$ $p < 0.001$
	only controlling	55	3.74	0.42	0.012	
	controlling & benchmarking	21	4.05	0.41	–	
Controlling & BPM	no method	53	3.64	0.41	0.002	$F(3,151) = 7.44$ $p < 0.001$
	only controlling	31	3.65	0.44	0.011	
	only BPM	26	3.54	0.28	0.000	
	controlling & BPM	45	3.94	0.40	–	
Controlling & BPR	no method	76	3.61	0.38	0.000	$F(3,151) = 6.39$ $p < 0.001$
	only controlling	64	3.77	0.44	0.026	
	controlling & BPR	12	4.13	0.33	–	
Controlling & BSC	no method	76	3.61	0.38	0.000	$F(3,151) = 6.60$ $p < 0.001$
	only controlling	63	3.76	0.41	0.022	
	controlling & BSC	13	4.12	0.45	–	
Controlling & Competency Based Mgmt	no method	67	3.59	0.34	0.003	$F(3,151) = 5.05$ $p < 0.01$
	controlling & CBM	18	3.97	0.61	–	
Controlling & CRM	no method	52	3.58	0.37	0.000	$F(3,151) = 6.11$ $p < 0.01$
	controlling & CRM	37	3.94	0.41	–	
Controlling & ERP	no method	64	3.61	0.37	0.000	$F(3,151) = 6.84$ $p < 0.001$
	only controlling	44	3.70	0.40	0.014	
	only ERP	15	3.61	0.42	0.014	
	controlling & ERP	32	3.99	0.44	–	
Controlling & KM	no method	65	3.60	0.36	0.004	$F(3,151) = 4.39$ $p < 0.01$
	controlling & KM	31	3.90	0.52	–	
Controlling & LM	no method	67	3.57	0.37	0.000	$F(3,151) = 6.10$ $p < 0.01$
	controlling & LM	27	3.94	0.58	–	

Effects		<i>N</i>	<i>M</i>	<i>SD</i>	<i>p</i> -value <sup>1</sup>	<i>F</i> statistic
Controlling & Outsourcing	no method	64	3.61	0.37	0.004	$F(3,151) = 4.37$ $p < 0.01$
	controlling & outsourcing	36	3.90	0.42	–	
Controlling & Six Sigma	no method	75	3.61	0.38	0.012	$F(3,151) = 4.57$ $p < 0.01$
	controlling & six sigma	11	4.02	0.42	–	
Controlling & TQM	no method	51	3.67	0.36	0.014	$F(3,151) = 6.37$ $p < 0.001$
	only TQM	28	3.51	0.39	0.000	
	controlling & TQM	36	3.93	0.43	–	
Efficiency effects						
Controlling & Benchmarking	no method	75	3.62	0.51	0.013	$F(3,154) = 3.35$ $p < 0.05$
	controlling & benchmarking	23	3.98	0.49	–	
Controlling & BPM	only BPM	27	3.55	0.57	0.036	$F(3,154) = 7.43$ $p < 0.001$
	controlling & BPM	44	3.88	0.45	–	
Controlling & BSC	no method	79	3.60	0.51	0.005	$F(3,154) = 4.80$ $p < 0.05$
	Controlling & BSC	13	4.09	0.49	–	
Controlling & LM	no method	68	3.58	0.51	0.003	$F(3,154) = 6.095$ $p < 0.01$
	controlling & LM	27	3.97	0.47	–	
Controlling & Outsourcing	no method	66	3.60	0.50	0.017	$F(3,154) = 3.03$ $p < 0.05$
	controlling & outsourcing	38	3.90	0.50	–	
Controlling & Six Sigma	no method	77	3.62	0.52	0.012	$F(3,154) = 3.03$ $p < 0.05$
	controlling & six sigma	11	4.11	0.34	–	
Controlling & TQM	no method	53	3.59	0.54	0.001	$F(3,154) = 5.01$ $p < 0.01$
	only TQM	29	3.67	0.46	0.045	
	only controlling	41	3.68	0.49	0.031	
	controlling & TQM	35	3.99	0.42	–	
Management effects		<i>N</i>	<i>M</i>	<i>SD</i>	Sig. lev.	<i>F</i> statistic
Controlling & KM	no method	68	3.62	0.44	0.021	$F(3,155) = 3.07$ $p < 0.05$
	controlling & KM	31	3.93	0.41	–	

Effects		<i>N</i>	<i>M</i>	<i>SD</i>	<i>p</i> -value <sup>1</sup>	<i>F</i> statistic
Controlling & Competency Based Mgmt	no method	71	3.60	0.44	0.004	$F(3,155) = 4.29$ $p < 0.01$
	only controlling	59	3.68	0.51	0.032	
	controlling & CBM	18	4.03	0.47	–	
Controlling & six sigma	no method	77	3.64	0.45	0.035	$F(3,155) = 2.83$ $p < 0.05$
	controlling & six sigma	11	4.06	0.50	–	

<sup>1</sup>The Tukey Post Hoc test was used for multiple comparisons. The baseline for comparison was the use of both methods.

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