



Balanced performance management in the public education system

An empirical study of Estonian general education schools

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Balanced performance management

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Abstract

Purpose – The purpose of this study is to investigate ways in which the performance management at different school management levels contributes to the performance of public schools in the Estonian general education system.

Design/methodology/approach – The study is based on the balanced performance management approach and focuses on performance management patterns in Estonian general education schools. At the individual, operational, and strategic performance management levels, the primary performance determinants are analysed. The study uses empirical survey data gathered from 164 schools providing upper secondary education in Estonia.

Findings – The research shows that a pupil's academic performance as the most common indicator of a school's performance influences individual goals, such as satisfaction with the quality of education and teaching in the school and the pupils' further choices and opportunities in education. The satisfaction of other interested parties such as teachers and parents is influenced by the school's strategic as well as operational performance management measures. Therefore, a school's performance management system must operate as a balanced system integrating the individual, operational and strategic performance management levels of the school.

Research limitations/implications – The general limitations of survey-based research have to be considered – the study is static in nature, although the longitudinal approach would allow assessing the dynamic aspects of performance management in public schools. In addition, it is necessary to further explore a wider set of individual, operational and strategic performance management indicators and their interconnections in the implementation of performance management in public schools.

Originality/value – The research findings have two main implications. First, the paper contributes to the limited knowledge about the implementation of performance management practices in public schools. Second, due to the fact that the Estonian education system is firmly based on approaches that have proven to be performance-enhancing, the analysis provides an overview of and information about the countries that have not gone to such lengths in the restructuring of their education system.

Keywords Performance management, General education schools, Public education, Estonia, Education, Schools

Paper type Research paper



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1. Introduction

During the past decade, an almost worldwide public sector reform has occurred. In response to an increasing concern about the legitimacy and efficiency of public spending, new public management (NPM) has become the leading philosophy of such reforms in most countries. NPM encourages the public sector to adopt private sector management techniques (Hood, 1995), and develop performance measurement and performance management (PM) methods for the provision of public services. Nowadays, most Organisation for Economic Co-operation and Development (OECD) countries are assessing the performance of public programmes and services (Curristine, 2005). Therefore, a much stronger commitment to public sector efficiency and effectiveness, and consequently to PM will be required from both central and local governments in the near future. Motivated by this, the management of education systems has been restructured – much more authority has been given to schools and local governments. With the aim of encouraging autonomous providers of local education to act in the best interest of pupils and parents, competition between schools is becoming stronger due to pupil-based funding. To survive, the operation of every autonomous school should be based on a quality-improving management system. In addition, the schools' accountability to the local community and other stakeholders is increasing. All these aspects are considered to contribute to the greater efforts of schools to act in the interests of pupils. Several empirical analyses (Wößmann *et al.*, 2007; Dempster *et al.*, 2001; Tolifari, 2005) suggest that various facets of accountability, autonomy and choice (or competition) are closely associated with the improved results of pupils.

Changes in the management of the education system need to be reflected in the schools' management information systems. For successful management, a school's management accounting and PM need to evolve. Literature describes several cases proving the significant positive effect that information obtained from the management accounting systems has on the performance of an organisation (Cadez and Guilding, 2008; Gerdin and Greve, 2004; Chenhall, 2003; Mahama, 2006). Despite the importance of PM, several authors (Irs and Ploom, 2009; Levacic, 2008) have argued that the majority of research papers examine a very limited part of the overall process of school PM, mainly concentrating on academic performance. There seems to be a lack of depth concerning the coverage of particular performance elements and the interconnections between them. Brudan (2010) defines three levels of PM: strategic, operational and individual. Therefore, it is important to clarify the relationship between the three main levels of school PM. If synergy is experienced between all the three levels, an individual's performance contributes to the performance of the entire organisation. The motivation to conduct this study in the Estonian context derived from prior evidence suggesting that PM in public schools is mainly concentrated on academic results (Bosker and Scheerens, 2000; Ascher and Fruchter, 2001; Karatzias *et al.*, 2001; Woods and Levačić, 2002), although proceeding from the NPM approach, more balanced and non-academic aspects should be involved in studying school PM. It should be acknowledged that these are broad claims that are not specific to Estonia.

The purpose of this paper is to study the ways in which PM at different school management levels contributes to the performance of public schools in the general education system of Estonia. With its highly decentralised education system, Estonia is an interesting example to investigate in connection with the PM used in schools as well as the education system as a whole. Since the Estonian education system is firmly based on approaches that have proven to be performance-enhancing, the analysis aims to give

an overview of the system with the purpose of providing information to countries that have not gone to such great lengths when restructuring their education systems. A school's performance is, on the one hand, assessed on the basis of its pupils' results and the overall satisfaction of the pupils and their parents; on the other hand, it is assessed on the basis of the school's financial performance indicators. If any significant correlations are found between any PM levels and the performance of pupils, it is important to analyse the interconnections or correlations between these levels as well. This enables us to achieve a more thorough understanding of the measures that contribute to the performance of both pupils and schools the most as well as of the secondary aspects that also influence performance and thus contribute to these primary measures.

The remainder of the paper is organised as follows: Section 2 sets out a theoretical background for analyses, drawing on the balanced PM approach. Section 3 is devoted to a discussion concerning the methodological issues related to the empirical study. Subsequently, the main variables of the strategic, operational and individual levels influencing a school's performance are analysed. A number of key issues in the study are presented in the conclusion.

2. Theoretical background

Performance measurement and management within the concept of NPM

The public sector has been under constant pressure to improve its performance and to restore the fragile trust of the people in public institutions since the early 1980s (Ter Bogt, 2001). The stimulus for an extensive reform in the public sector (NPM) stemmed from the belief that governments are excessively large, inefficient and unresponsive to change (Pollitt and Summa, 1997; Guthrie and Parker, 1998). Among the basic premises of NPM, Fryer *et al.* (2009) emphasise performance measurement, which relies on explicit standards and measures of performance, and increased accountability and parsimony in the use of resources. They also view performance measurement as the main obstacle in bringing PM into the management of the public sector; they stress that "many of the proposed solutions are broad brush and do not provide organisations with details on how to progress" (Fryer *et al.*, 2009, p. 492). Lapsley (2008) emphasises performance measurement as a key feature of NPM – the latter reflects the desired objectives as well as the actual outcomes of an organisation. PM is defined by Bititci *et al.* (1997) as the process by which an organisation integrates its performance with its corporate and functional strategies and objectives.

Public sector PM is a multidimensional research area based on various theoretical concepts and approaches (Greiling, 2006). Mussari (2001) has pointed out that the emphasis on decentralised managerial and financial control in the public sector, as well as the fostering of "performance culture" or "performance orientation" has resulted in the increasing use of PM tools. The concept of public sector performance was clarified by Brignall and Modell (2000) via overall public wellbeing and national development along with the best use of resources. Performance can therefore be improved by ensuring greater efficiency and effectiveness. Lockheed and Hanushek (1994, pp. 5-6) explain these two concepts in the framework of the performance of education systems:

A more efficient system obtains more output for a given set of resource inputs, or achieves comparable levels of output for fewer inputs, other things being equal. [...] Educational effectiveness is whether or not a specific set of resources has a positive effect on achievement and, if so, how large this effect is.

Thus, efficiency means the best use of resources while effectiveness is rooted in strategic objectives, i.e. whether or not those objectives were achieved and which strategies were used to achieve them.

Speaking of the performance management system (PMS), a number of authors (Bitici *et al.*, 2000; Neely *et al.*, 2000; Garengo *et al.*, 2005; Stringer, 2007) have defined it as a dynamic system, while others (Kaplan and Norton, 1992; Garengo *et al.*, 2005; Stringer, 2007) refer to it as a balanced system. According to Bitici *et al.* (2000), a dynamic PMS is defined as a system that monitors the developments and changes that occur in external and internal environments. As business environments and organisations themselves are changing, PMSs also need to change in order to sustain their relevance and usefulness and to adapt their PM practices to survive. According to Ferreira and Otley (2009), the change in PMSs applies to the PM methods and key performance indicators used and also to the way PM information is taken advantage of.

A balanced (or multidimensional) PMS is defined as a system that adopts various perspectives of analysis and manages these in a coordinated way (Garengo *et al.*, 2005). Kaplan and Norton (1992) propose balancing four different perspectives based on both the nature of the measures (financial and non-financial) as well as the object of the measures (internal and external). Horváth *et al.* (2006) argue that advanced PM practices consider a broad range of measures and include, for example, financial indicators as well as indicators related to customer satisfaction and human resources. In the light of the NPM approach, it is reasonable to assume that PM at schools could also be balanced and have a dynamic character.

Integration of strategic and individual PM

According to Brudan (2010), PM in the organisational context has been divided into three levels: strategic, operational and individual. At the strategic level, PM deals with the achievement of organisational objectives. The key processes related to strategic PM are the formulation and execution of strategies, both subsets of strategic management (Brudan, 2010). PM at the operational level is linked to operational management, as its focus is on the achievement of departmental or group objectives. Although it is aligned with the corporate strategy of the organisation, its focus is more functional. Therefore, as operational performance is traditionally evaluated in terms of efficiency and effectiveness, the evolution of operational PM is linked to the evolution of accounting and management.

In recent years, one of the key trends has been the integration of strategic PM and individual PM. Organisational goals were reflected in individual goals and individual measures became aligned with organisational performance measures in an effort to increase the accountability of all employees in the execution of organisational strategies (Brudan, 2010). Fryer *et al.* (2009) identify leadership and stakeholder commitment to integrating the PMS into an organisation's existing systems and strategies as the key features of a successful PMS. However, PM culture – the manner of improving and identifying good performance and actions taken in case of poor performance – is also essential. It can be said that the integration of strategic and individual PM (i.e. an organisation's strategic long-term objectives and the individual objectives of its members) is the main problem connected with the implementation of PM, as will also be argued further in this paper.

The implementation of NPM and PM in public sector organisations has not been very successful – Fryer *et al.* (2009, p. 491) note that “*expected improvements in public sector*

performance have not yet materialised". Modell (2004) explains the failed implementation of PM with performance measurement myths that are spreading in public sector organisations. Although the concept of PM seems to be a good way of achieving and reflecting an organisation's objectives and its stakeholders' expectations and requirements, Brudan (2010) argues that the goals of the organisation may be in conflict with the goals of the individuals inside the organisation. The contradictions between the objectives of the organisation and the individuals, and the solutions to such problems are handled by the agency theory (Eisenhardt, 1985). However, Näsi (1995) emphasises that an enterprise itself quite simply has no goals – the existing ones are actually the stakeholders' input/demands as to their contributions/rewards. This statement can be expanded and applied to any organisation, including public sector organisations. It can, therefore, be argued that the goals of a public organisation reflect the goals of its stakeholders. Furthermore, Brenner and Cochran (1991) and Calton (1993) argue that an organisation's existence is only possible until it keeps its stakeholders – the interested parties – satisfied. Based on this argument, Windsor (1992) bridges the agency and stakeholder theories, arguing that the latter is an extension of the former.

The stakeholder theory concerns the morals and values related to managing an organisation, first detailed by Freeman (1984). Näsi (1995) explains that the stakeholder theory has attracted considerable attention since people require companies to have high standards and behave morally, and openly publish information about their activities. At the beginning of this section, it was argued that the stakeholders' attention on public spending and the quality of public services was the main force propelling the need to change public sector management practices, and as a result, NPM was introduced. Therefore, stakeholders now have much more influence over the management decisions of public as well private organisations.

The stakeholder theory emphasises accountability as the main way for organisations to communicate with their stakeholders (Niskala and Näsi, 1995). However, accountability is also one of the most difficult tasks to solve in the framework of PM – Fryer *et al.* (2009) stress that defining appropriate indicators, their quality and the manner in which they should be reported is still a problem in need of a solution in the context of PM.

Performance measurement and management in public schools

Motivated by the NPM approach, the management of the education system was also restructured – much more authority was given to schools and local governments. For example, the Business and Industry Advisory Committee to the OECD (2007) suggests that school headmasters should be given wide-ranging authority, which would lead to better school performance. With the aim of encouraging autonomous providers of local education to act in the best interest of pupils and parents, competition between schools is becoming stronger due to pupil-based funding (Dempster *et al.*, 2001). An empirical analysis conducted by Wößmann *et al.* (2007) suggests that different facets of the accountability and autonomy of schools and the pupils' right to choose between schools are closely associated with pupil achievement. Therefore, in order to survive, every autonomous school should work with a quality-improving management system and acknowledge the interests of its stakeholders. According to Webb and Vulliamy (1998), organised performance monitoring and evaluation evidence are more important in a decentralised system than they are in a centralised one.

In order to measure performance, it must be clearly defined first. School performance and the measurement and management thereof have been important issues for a number of researchers (Bosker and Scheerens, 2000; Ascher and Fruchter, 2001; Karatzias *et al.*, 2001; Woods and Levačić, 2002; Anderson *et al.*, 2003; Irs and Ploom, 2009, 2003; OECD, 2008). The majority of them are concentrated on academic performance issues. According to Levacic (2008), school performance measurement is a complex matter. She claims that using simple indicators of efficiency, such as costs per pupil, can be very misleading. The principles and tasks of the public sector (and more so of the education sector) are manifold and vague, and therefore, the performance related to these goals is difficult to measure. Education is in its essence conflicting: its goal is to achieve excellence and efficiency while ensuring social, gender-related and racial egalitarianism.

School performance measurement and management issues have been highlighted as important contingencies of the quality and efficiency of the education system. In the light of the NPM approach, it is reasonable to assume that the PM at schools could also be balanced and dynamic in nature. However, the majority of the studies referred to above concentrate on the academic aspects of performance. Irs and Ploom (2009) point out that in Estonian educational institutions, performance is mainly measured by academic performance, i.e. how well a pupil meets the standards set out by the local government and the educational institution itself, and stress that this is quite a narrow viewpoint. For example, it is often believed that higher school expenditures and optimum class sizes have a significant positive impact on the achievements of pupils (Hanushek, 1986). Therefore, in a number of programmes, countries either set explicit limits on the maximum number of pupils in a class or provide monetary incentives to keep the class size small. Furthermore, Hanushek (2005) has proven that good academic performance ensures better coping in the labour market, and therefore, in future life. Thus, the academic performance of pupils is rather the medium objective of the public education system in achieving the main goal of public services as a whole – better wellbeing and national development. The following research questions (RQ) are posed in the discussion:

RQ1. What are the main measures that reflect a school's performance?

RQ2. Which indicators influence these measures?

Cheng and Tam (1997, p. 23) provide a solution to the problem of performance measurement in education through the satisfaction model – they argue that the quality and survival of a school is associated with their “fitness for use”, i.e. the satisfaction of strategic constituencies. They specify policy-makers, parents, the school's management committee, teachers, and pupils as strategic constituencies. This is in harmony with the stakeholder theory, which emphasises stakeholder requirements and expectations as the key elements of an organisation's performance. A school's strategic constituencies may also be handled as stakeholders under the circumstances of NPM – parents and pupils are free to choose a school and schools are accountable to them. There are also several cases of empirical evidence (Goodenow and Grady, 1992; Wehlage *et al.*, 1989) about the positive relationship between school satisfaction and the pupils' motivation and their commitment to the school. These explorations serve as the basis for the following research question:

RQ3. How is stakeholder satisfaction, which concerns the quality of teaching and education in the school, related to the school's performance?

It is important to acknowledge that stakeholder satisfaction as an objective at the individual level of the organisational context would be too limited to allow measuring a school's performance as a whole. Stakeholder satisfaction only reflects those aspects of an organisation's performance that stakeholders have certain knowledge about. The latter depends on the organisation's willingness and openness, and the implementation of their accountability to stakeholders. Beck and Murphy (1998) claim that although collaboration with stakeholders has an important role to play in a school's performance, it only contributes to the school's performance if certain processes support accountability in the school. For example, the satisfaction of teachers regarding school performance may or may not be dependent on the school's efficiency and financial performance. If teachers were involved in and aware of the school's budgeting and financing priorities, their satisfaction would presumably reflect the school's financial performance as well. Thus, it is important to balance a school's performance measurement between academic and non-academic, financial and non-financial measures. This claim is the basis for the central research question posed in this paper:

RQ4. What kind of relationships are there between strategic, operational and individual PM issues?

The survey carried out by the OECD (2008) among 25 OECD member states and candidate countries (including Estonia) indicates that Estonian general education schools have relatively high authority over decisions concerning the school curriculum, human resource management, development planning and budgeting. The most important elements of a school's accountability system are the school's internal and external evaluation. A survey carried out in 2007 (OECD, 2008) showed that a school's self-evaluation and external evaluation systems are only employed in half of the surveyed countries (in 14 countries out of 29). Thus, the external evaluation and self-evaluation of a school's activities are not very widespread in educational policies; this area has been studied relatively poorly. In Estonia, both external evaluation and self-evaluation are applied and legally required. Therefore, with its highly decentralised education system, Estonia is an interesting example on which to investigate the implementation of PM principles in schools.

The Estonian Basic School and Upper Secondary School Act stipulates some principles for the strategic planning of schools. In order to ensure the consistent development of a school, the school shall prepare a development plan in co-operation with the board of trustees (council) and the teachers' council. The board of trustees consists of the representatives of teachers, parents, the local government, pupils, graduates, and other organisations that support the school. Therefore, strategic planning can be seen as a systematic process for the management of an organisation. A school's development plan shall set out the main objectives and areas of development for the school, an activity plan spanning three years and a procedure for the renewal of the development plan. However, the legal regulation referred to above does not give any methodical advice on planning, budgeting or reporting issues. Consequently, although there is a formal legal framework for Estonian public schools, which enables designing a balanced PMS, the implementation of such regulations at the school level depends on the willingness and competence of the schools.

3. Methodology

The purpose of the paper is to investigate the ways in which various PM levels in an organisational context contribute to the performance of schools in Estonian general education schools. To study the subject, two main research objectives were set out:

- (1) defining a school's performance variables and measures incl. the associated stakeholder satisfaction by using a balanced approach (*RQ1* and *RQ2*); and
- (2) measuring the characteristics of the operational and strategic management of a school and their contribution to the school's performance as well as stakeholder satisfaction (*RQ3* and *RQ4*).

The study relies on both primary and secondary sources. Therefore, in preparation for writing the paper, the authors studied documents such as government publications, legal acts and regulations related to the issues discussed, as well as the strategic documents of schools and the statistic data available in the Estonian Education Information System (EEIS). EEIS is an individual-based database encompassing the relevant data of Estonian schools – data on all teachers, pupils, school curricula and the physical environment of schools. In addition, the schools' expenditure data from local governments, gathered by the researchers, was analysed. According to the Estonian Accounting Act, local governments are obligated to submit their aggregated accrual-basis financial data to the Ministry of Finance; this data from all schools is based on the same accounting principles and guidelines. This enabled us to gather comparable detailed data on the schools' expenditure. But there was also a restriction – the expenditure data was not available for private general education schools. Thus, private schools were excluded from the analyses. As the number of private schools is rather small, it did not influence the general overview of the situation.

A substantial part of the empirical data in this paper, in addition to EEIS and the expenditure data of the schools, was collected by means of a questionnaire survey. The questionnaire was compiled by the authors of the paper. It consisted of 67 questions; several of them had many underlying statements and criteria to measure. There were a total of 127 statements in the questionnaire. The answers to the questions were given on a five-point Likert scale (1 – strongly disagree; 2 – tend not to agree; 3 – difficult to evaluate; 4 – tend to agree; 5 – strongly agree). The respondents were also given the possibility to choose 0, which stood for having no information or capacity to answer. The questionnaire consisted of four main sections concerning the implementation of the following areas of school management:

- (1) strategic management;
- (2) resource management and collaboration with stakeholders;
- (3) learning processes and quality management; and
- (4) school performance evaluation.

The target groups of the questionnaire were all Estonian general education schools where upper secondary education is provided. The survey was addressed to all of the most important stakeholders of the school: headmasters, teachers, pupils and their parents. Regarding teachers, pupils and parents, the target groups were limited to the pupils and teachers studying or teaching in the 12th grade and to the parents of these pupils. The 12th grade was chosen since 12th graders are the oldest pupils in the school and as such,

are expected to have the best idea about how the school is operated and managed. Before the main study, the questionnaire was tested on a few headmasters and teachers. After testing, the pilot study was implemented in 11 randomly selected schools (a total of 11 headmasters, 51 teachers, 121 pupils, and 49 parents filled in the questionnaire). The schools were selected from three Estonian counties – Lääne, Viljandi and Tartu – and the main objective motivating the selection was that schools of different sizes would be represented in the pilot study. The questionnaire was improved on the basis of the analysis of the results obtained from the pilot study. The improvement consisted of reformulating some statements and improving the structure of the questionnaire.

The main study was executed from November 2009 to January 2010. The questionnaire was sent out electronically and in a written format. As all the schools in Estonia have access to the internet, most of the respondents had the opportunity to fill in the questionnaire online. An electronic solution called the eFormular was used for the study. This is a unique tool that provides the possibility to create electronic forms (eFormulars) and conduct surveys via the internet. A request to participate in the survey was sent out to all general education schools in Estonia. In case of schools that wished to respond by letter, the questionnaires were sent by regular mail in envelopes which could be returned without an additional fee (prepaid for by the research team). The research team, including both authors of this article, wished to attract as many schools as possible. By the end of December 2009, about half of the schools had filled in the survey. The research team was not satisfied with the response rate, and thus spent two weeks telephoning all the schools that had not responded. As a result, most of the schools agreed to participate, apart from schools that had a special reason not to do so (e.g. taking part in another survey or having other time-consuming duties).

The final number of respondents was as follows: 119 headmasters (principals), 1,251 teachers, 4,118 pupils, and 1,244 parents from 164 different schools. The total number of the target schools of the survey in the school year 2009/2010 was 209; there were altogether 9,614 pupils studying in the 12th grade. Consequently, the responses of 56 per cent schools in the whole sample were analysed for the paper. The percentage of participants was a little lower (43 per cent) in case of pupils. This can be explained by the fact that some of the schools in Estonia are quite large and have several parallel classes; the study, however, specified that only one class should take part in the study in case of several parallel classes. Therefore, the number of schools participating in the survey would be the best indicator to measure the proportion of the sample. Sample representative ness was also analysed by different school groups according to the size of the school (number of pupils), the location of the school (cities and rural areas), the academic performance of pupils and other criteria. The analyses indicated that the final sample analysed in this paper is in accordance with the statistics gathered about all schools from the EEIS.

The collected data was analysed using SPSS version 18.0. On the basis of the returned surveys, a statistical analysis was carried out using a one-way analysis, a two-way analysis, a factor analysis and a correlation analysis to achieve the goal of the study. The principal axis factor analysis by varimax rotation was used to identify the main variable or statement groups in each of the sections mentioned above (i.e. strategic management and others). In order to determine the number of factors, interpretation in the light of theory (Kim and Mueller, 1978) was used in addition to the Kaiser criterion. In the final factor model, the variance explained in the four sections of the questionnaire remained between 50 and 64 per cent. Composite measures (indicators) were calculated on

the basis of the results of factor analysis, using the additive aggregation method (Krantz *et al.*, 1971). As one of the objectives was to measure the existence of various aspects of school management in a certain school, only the positive/agreeing answers were taken into account (“5” – “strongly agree” and “4” – “tend to agree”). The scale categories were defined accordingly: “5” – 2 (points) and “4” – 1 (point). All other scale categories were defined as 0 (points). Next, the arithmetic mean of the points received from all the answers was calculated for every stakeholder group in every single school. Since the number of assertions in various composite measures differed, the composite measures were normalised. The internal consistency for each composite measure was assessed using the Cronbach’s α coefficient (Cronbach, 1951). The fact that the Cronbach’s α coefficient for some of the indicators presented in Appendix 1 is unacceptable, i.e. below 0.6 (DeVellis, 1991) can be explained by the fact that many Estonian schools lack the knowledge about these issues, as it is also argued further in this paper.

As a result, 24 indicators were identified and labelled to investigate the contribution of various management levels to the performance of a school. The list of indicators is given in Appendix 1.

In order to define a school’s performance measures and the associated variables, Pearson’s correlations between main pupil performance measures and 24 indicators were assessed. As a result, only the variable measuring the satisfaction of teachers, parents and pupils regarding the quality of education and teaching showed a significant ($p \leq 0.01$) and moderate or strong ($r > 0.3$) correlation with pupils’ performance measures. The main pupil performance measures were taken to be the following:

- the results of state examinations, average score of the years 2006-2009;
- the share of pupils not continuing their studies at all during the year following graduation from an upper secondary school, average score of the years 2006-2009; and
- the share of pupils continuing their studies in university during the year following graduation from an upper secondary school, average score of the years 2006-2009.

In Estonia, there are two options for people in the education system after graduation from an upper secondary school: to continue studies in higher education – at university – or in a vocational school. The statistics show that pupils with better academic results generally continue their studies at university, while others go to vocational schools.

In addition, the relationships between several other measures and the measures of pupils’ performance, introduced above, were analysed. Pearson’s correlations were assessed between the different characteristics of the school and the school’s expenditure data. As a result, seven measures were identified that introduced statistically significant ($p \leq 0.01$) and moderate or strong ($r > 0.3$) correlations. Those seven measures were:

Characteristics of the school:

- (1) number of pupils in the school;
- (2) number of pupils per class;
- (3) number of pupils per teacher; and
- (4) classroom area per pupil.

Expenditure data:

- (1) a teacher's average wages in the school;
- (2) the headmaster's average wages in the school; and
- (3) the school's teaching expenditure (including the teachers' wages and teaching materials) per pupil.

In order to determine the main characteristics of school management influencing a school's performance, a corresponding correlation analysis was carried out. Pearson's correlations between the satisfaction variable and all other 23 indicators were assessed. As a result, eight main indicators defining significant ($p \leq 0.01$) and moderate or strong ($r > 0.3$) correlations with satisfaction variables were distinguished in the responses of all stakeholders. The list of indicators and corresponding statements from the initial questionnaire are given in Appendix 2.

In order to study the influence of these eight indicators on a school's performance, all variables were classified into three main PM level indicator groups, introduced in Section 2 of this paper – the individual, the operational and the strategic level. This classification gives us the opportunity to engage different PM level indicator groups in further analysis in a balanced way. As a result, the following school performance indicators were distinguished:

- (1) Individual level performance measures:
 - parent satisfaction regarding the quality of teaching and education in the school;
 - pupil satisfaction regarding the quality of teaching and education in the school;
 - teacher satisfaction regarding the quality of teaching and education in the school; and
 - headmaster satisfaction regarding the quality of teaching and education in the school (although this variable was not strongly correlated with the academic performance of pupils, it is still interesting to analyse which indicators contribute to headmaster satisfaction regarding the quality of education and teaching).
- (2) Operational level performance measures:
 - ethics, open communication in the school;
 - attention paid to the interests of pupils;
 - expected good academic performance; and
 - supportive culture in the school.
- (3) Strategic level performance measures:
 - systematic evaluation of the performance of pupils.
 - dynamic strategic planning;
 - financial PM; and
 - communication with the stakeholders.

4. The main findings and discussion

The performance measures of a school and the variables influencing it

In order to define the performance measures of a school and the variables influencing performance, we ran a correlation analysis between the main pupil performance measures, the 24 indicators, the characteristics of the school and the school's expenditure data. Concerning the indicators, only the indicator measuring the satisfaction of teachers, parents and pupils with the quality of education and teaching introduced significant correlation with the pupils' performance measures. Table I shows the bivariate Pearson's correlation coefficients between the abovementioned variables. All the correlations presented are significant at $p \leq 0.01$. The table only includes correlation coefficients presenting moderately and highly significant relationships ($r \geq 0.30$).

Our analysis revealed that the academic performance of pupils, i.e. the results of state examinations, are strongly correlated to the further choices of pupils after acquiring upper secondary education. The correlation between these two variables – the school's average score of state examinations and the share of pupils continuing their studies at

Variable group	Variable	Correlation coefficients		
		(1) ^a	(2) ^b	(3) ^c
Pupil performance variables	(1) The results of state examinations (average score of the years 2006-2009)	1	-0.53	0.76
	(2) The share of pupils not continuing their studies during the year following graduation from an upper secondary school (average of the years 2006-2009)	-0.53	1	-0.72
	(3) The share of pupils continuing their studies in university during the year following graduation from upper secondary school (average of years 2006-2009)	0.76	-0.72	1
Stakeholder satisfaction	Parent satisfaction regarding the quality of teaching and education in the school	0.39		
	Pupil satisfaction regarding the quality of teaching and education in the school	0.33		
	Teacher satisfaction regarding the quality of teaching and education in the school	0.36		
Characteristics of the school	Number of pupils in the school	0.61	-0.34	0.56
	Number of pupils per class	0.49		0.50
	Number of pupils per teacher	0.50		0.54
	Classroom area per pupil	-0.32		
Expenditure data	A teacher's average wages in the school	0.42		
	The headmaster's average wages in the school	0.31		0.33
	The school's teaching expenditure (including the wages of teachers and teaching materials) per pupil			-0.42

Table I. Results of correlation analysis between pupil performance variables, school characteristics and the school's expenditure data*

Notes: *only correlations statistically significant at: $p \leq 0.01$ and only correlation coefficients $r > 0.3$ are presented; ^aThe results of state examinations (average score of the years 2006-2009); ^bthe share of pupils not continuing their studies during the year following graduation from an upper secondary school (average of the years 2006-2009); ^cthe share of pupils continuing their studies in university during the year following graduation from an upper secondary school (average of the years 2006-2009)

university during the year following graduation from an upper secondary school – reaches 0.76. A presumptive strong negative correlation is also found between the share of pupils not continuing their studies at all, and the share of pupils continuing their studies at university during the year following the completion of upper secondary education ($r = -0.72$). Statistics show that pupils with better academic results generally continue their studies at university, while others go on to vocational schools. In addition, there is a third group – the pupils who do not continue their studies at all. In this paper, two groups are analysed: the pupils who have the best academic results on average and continue their studies at university (indicator (3) in Table I), and the pupils who supposedly have the lowest academic results on average, i.e. the pupils who do not continue their studies at all during the year following their graduation from an upper secondary school (indicator (2) in Table I).

The conducted correlation analysis also revealed that the schools in which the average score of state examinations is higher have a smaller share of pupils who do not continue their studies after the completion of upper secondary education. Since upper secondary schools in Estonia usually only provide basic education without any qualifications, continuing studies after the completion of upper secondary education is highly important to achieve the education needed in order to successfully participate in the labour market and become a responsible citizen. The latter may also be defined as the main objective of public education system, and therefore, the indicators introduced have an important role to play in determining a school's performance from the point of view of society as a whole. Thus, the academic performance of pupils may also be considered as a medium used to achieve the strategic objective of the public education system – contribute to public wellbeing and national development.

Upon studying stakeholder satisfaction regarding the quality of teaching and education in a school, statistically significant ($p \leq 0.01$) correlations ($r = 0.33-0.39$) were only found in case of the variable that measures the results of state examinations. This result could be explained by the fact that in Estonia state exams serve as a part of admissions criteria for universities, which also reflects the reliability of these exams. Additionally, the results of state examinations are widely presented in media and different rankings of schools providing upper secondary education are published. Therefore, public interest in, as well as people's knowledge about, state examinations is quite high and often, the evaluations regarding a school's performance are based on the results of state examinations. This statement is supported by Irs and Ploom (2009), who point out that in Estonian educational institutions, performance is mainly measured by academic performance.

The result also supports the main argument of the satisfaction model that the satisfaction of stakeholders or constituencies is positively related to the performance of an organisation as a whole.

In addition, several other school characteristics and the correlations between school expenditure variables and pupil performance indicators were tested. Table I shows that rather strong positive correlations were found between pupil performance and the size of the school (variables "number of pupils in the school", "number of pupils per class"), school efficiency (variables "number of pupils per teacher" and negative correlation with "classroom area per pupil"). When considering expenditure data, positive correlations were observed between pupil performance and the average wages of teachers and the headmaster (accordingly, $r = 0.31$ and $r = 0.42$). At the same time, the analysis of the

entire correlation matrix, which was produced to estimate interactions between all the variables introduced, revealed that there were also significant correlations between the average wages of teachers and headmasters and:

- the number of pupils in the school ($r = 0.31$ and $r = 0.45$, respectively); and
- the number of pupils receiving upper secondary education in the school ($r = 0.37$ and $r = 0.32$, respectively).

In addition, teaching expenditure per pupil is strongly correlated with the size of the school ($r = 0.61$). This is also confirmed by relation analysis between the variables “teaching expenditure per pupil” and “classroom area per pupil” ($r = -0.59$).

Therefore, it can be concluded that larger schools (according to the number of pupils) in Estonia tend to be more effective and efficient, ensure better pupil performance and are able to provide teachers and headmasters with higher wages. The expenditures per pupil are also lower in larger schools due to higher efficiency and a smaller classroom area per pupil (which is presumably not fully occupied). All these variables can be connected to the size of the school.

As a result of the correlation analysis between pupil performance characteristics and stakeholder satisfaction regarding the quality of teaching and education, it can be concluded that the most significant variables indicating school performance are as follows:

- First, the results of state examinations. This variable is strongly correlated with the pupils' choices related to their further education and therefore also with their personal development. This is in harmony with the results of Hanushek's (2005) study, which pointed out that the academic performance of pupils also influences their performance in future life.
- Second, the satisfaction of the main stakeholders (parents, pupils, teachers) with the quality of education and teaching in the school. These indicators are influenced by the variable that measures the average results of state examinations. Stakeholder satisfaction, as argued in Section 2 of this paper, is important from the perspective of the school's accountability to stakeholders, which is a significant component of a decentralised education system.
- Third, the size of the school. Larger schools (according to the number of pupils) in Estonia tend to be more efficient and effective, because teaching in a larger school is less expensive and seems to yield better results – thus, pupils in larger schools perform better. However, it is important to emphasise that the correlation analysis provides limited information about the actual relationship between the size of a school and its performance, since the relationship is not a linear one.

Therefore, it can be concluded that individual goals, such as satisfaction with the quality of education and teaching in the school are influenced by the academic performance of pupils. As the latter also influences the pupils' later choices and opportunities in the education system, and may therefore be argued to be one of the strategic goals of the public education system as a whole, it can be concluded that the performance objectives of the individual level are positively connected with strategic performance measures in the Estonian education system.

It is also important to mention that only weak correlations were found between headmaster satisfaction regarding the school's education and teaching quality and

pupils' performance variables; none of the correlations were significant at $p \leq 0.01$; only the correlation with state examination results proved to be statistically significant at $p \leq 0.05$, producing a relatively weak correlation at $r = 0.21$. In a more detailed analysis of the headmasters' answers to the questionnaire, it could be seen that none of the headmasters reported dissatisfaction with the quality of education and teaching in the school, although a quarter of the headmasters (25 per cent) questioned did not have an opinion on these matters (answers "3" – "difficult to evaluate" and "0" – "have no information to answer"). Situations like these are very problematic, since in case of high satisfaction, it is unlikely that there is enough motivation to improve, and furthermore, the absence of strong opinions regarding a question as important as this reflects a lack of interest in and knowledge about analysing and evaluating the performance of the school as a whole. This result refers to the problem which was also mentioned in Section 2 of this paper – although Estonian legislation has established a framework for integrated PM, its implementation may be complicated if the people responsible for implementing it do not receive enough methodical advice and support.

Analysis of the operational and strategic PM variables influencing the performance of a school

In the previous part of this section, it was concluded that the most important measures related to a school's performance are the results of state examinations. This variable is significantly correlated with the satisfaction of the main stakeholders with the quality of teaching and education in the school – the objectives of the individual level. As argued in Section 2 of this paper, in the organisational context the PM can be divided into three levels: strategic, operational and individual. The interconnections between these levels and the contribution thereof to the performance of a school will be analysed as follows.

As described in Section 3 of this article, a wide range of questions was incorporated into the questionnaire of the survey, which targeted the main groups of a school's stakeholders – teachers, headmasters, pupils and parents. Based on the responses given to the questionnaire, 24 composite measures or indicators were calculated. Further analysis tested the correlations between the 23 indicators described and the indicator measuring the satisfaction of parents, teachers, pupils, and headmasters with the quality of education and teaching. As mentioned above, the satisfaction indicators are significantly correlated with the performance of pupils, and therefore, these indicators also reflect the performance of the school. As a result, eight main indicators defining significant ($p < 0.01$) and strong or moderate correlations with satisfaction indicators were distinguished in the responses of all stakeholders. To study the influence of these indicators on the performance of a school, all indicators were classified into three main groups of PM levels introduced in Section 2 of this paper: individual, operational and strategic management level indicators. This classification gives us the opportunity to engage different PM level indicator groups into the further analysis in a balanced way.

All of the indicators were calculated for every single stakeholder group. This gave us the chance to analyse whether opinions about a school's performance and the other factors that influence performance were consistent in the answers of the teachers, parents, pupils and headmasters. The analysis also involved headmasters despite the fact that the satisfaction of headmasters did not prove to be significantly correlated with the performance of pupils in the school. In conclusion, it was analysed how the satisfaction of the stakeholders with the quality of education and teaching in a school

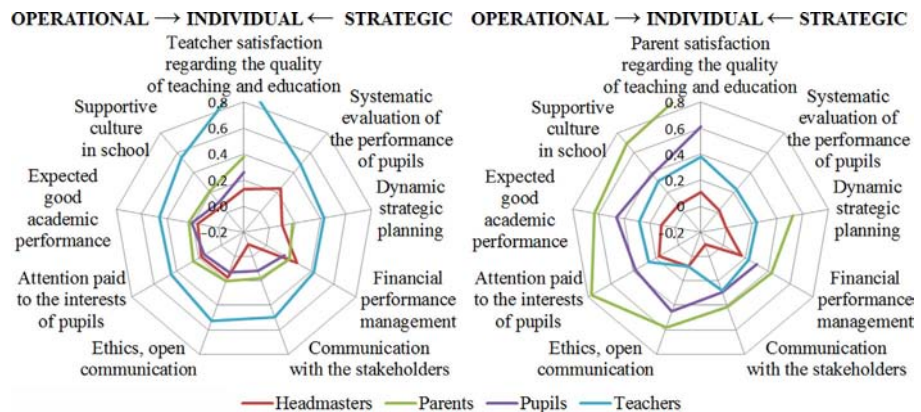
was influenced by their own opinions as well as the opinions of other stakeholders in the following eight operational and strategic performance areas:

- (1) supportive culture;
- (2) ethics and open communication;
- (3) financial PM;
- (4) communication with the stakeholders;
- (5) attention paid to the interests of pupils;
- (6) good academic results;
- (7) evaluation of pupil performance; and
- (8) dynamic strategic planning.

The satisfaction of the teachers, parents, pupils and headmasters with the quality of education and teaching in a school, considered as the school's performance measures, were defined as the performance objectives of the individual level, as they reflect the attitude of the main stakeholders of a school towards the school and indicate whether the school has succeeded in responding to the requirements and expectations of its stakeholders. Other indicators characterising school management reflect operational and strategic PM levels. Operational and strategic PM levels are the responsibility of the school's management.

Subsequently, we analysed the relations between the satisfaction of a school's stakeholders with the indicators of the school's education and operational and strategic PM. As a result of the analysis, the most evident pattern of correlations emerged in the opinions of teachers. Figure 1 (left-hand graph) shows that all the significant indicators identified as contributing to a school's operational and strategic performance are quite strongly correlated with teacher satisfaction regarding the quality of education and teaching in the school ($r = 0.42-0.55$, all correlations are significant at $p \leq 0.01$). The left side of the graph provides the operational performance indicators of schools, while the right side provides the strategic performance indicators of schools. Based on the analysis, we can conclude that the individual satisfaction of teachers with the quality of education and teaching is quite evenly related with both operational and strategic

Figure 1. Correlations between teacher (graph on the left) and parent (graph on the right) satisfaction regarding the quality of education and teaching and other operational and strategic management indicators



management components. However, for teachers, operational management indicators tend to be more important (average correlation with teacher satisfaction $r = 0.50$) than strategic management indicators (average correlation with teacher satisfaction $r = 0.46$).

The pattern of parents' opinions (Figure 1, graph on the right) has similar features in common with the opinions of teachers. The relationship between the indicators and the parent satisfaction indicator introduce even stronger correlations ($r = 0.41-0.77$, all correlations significant at $p \leq 0.01$). It is also important to mention that parents were not asked to answer questions on the systematic evaluation of pupil performance, since the researchers assumed that parents would not have enough knowledge to answer them. Similarly to the opinions of teachers, in case of parents it can also be concluded that their individual satisfaction with the quality of education and teaching is related to operational and strategic management components. However, for parents, operational management features tend to be more important (average correlation with teacher satisfaction $r = 0.66$) than strategic management indicators (average correlation with teacher satisfaction $r = 0.45$).

The opinions of pupils (Figure 2, graph on the left) are also quite consistent with the opinions of both teachers and parents. The correlation coefficients in case of pupils fall within the range $r = 0.30-0.75$. Again, some questions were not presented to pupils, such as those concerning the systematic evaluation of pupil performance and dynamic strategic planning. The research team assumed that the pupils would not have sufficient knowledge to answer these questions. Still, there are two indicators that enable to evaluate the contribution of strategic management indicators to the satisfaction of pupils with teaching. The average correlation between strategic management indicators and pupil satisfaction regarding teaching in schools is much weaker ($r = 0.38$) than the correlation with operational management indicators ($r = 0.71$).

Headmaster satisfaction introduces the weakest correlations with operational and strategic management indicators (Figure 2, graph on the right), although these relations are much more significant in case of analysing the indicator of teacher, parent and pupil satisfaction. The average correlation of operational management indicators with headmaster satisfaction regarding the quality of teaching and education in the school is only 0.42. It is evident that the most important operational management indicators for headmasters, correlated with their satisfaction, are the presence of a supportive culture in the school ($r = 0.57, p \leq 0.01$), paying attention to the interests

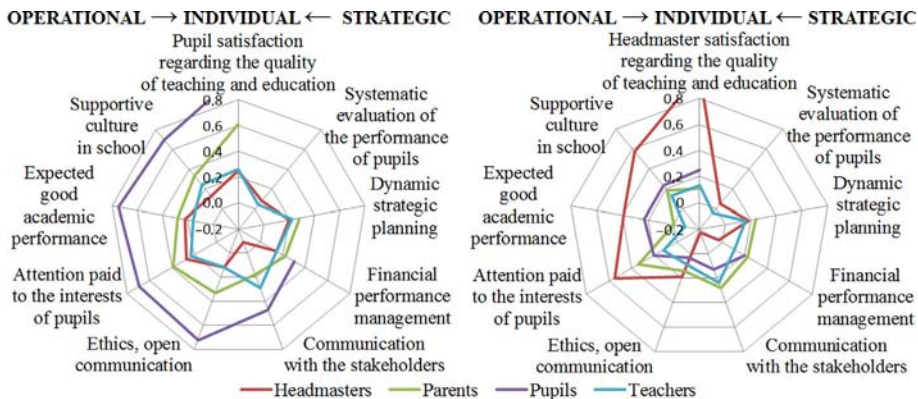


Figure 2. Correlations of pupil (graph on the left) and headmaster (graph on the right) satisfaction regarding the quality of education and teaching and other operational and strategic management indicators

of pupils in the school ($r = 0.55$, $p \leq 0.01$) and the expected good academic performance of the pupils ($r = 0.39$, $p \leq 0.01$). All these indicators reflect the operational PM level. As our analysis revealed, no strategic management indicators introduce statistically significant (neither at $p \leq 0.01$ nor at $p \leq 0.05$) correlations with headmaster satisfaction regarding the quality of education and teaching in the school.

In addition, the analysis showed that 92 per cent of the headmasters declared that the financial resources of the school were used efficiently, and in 71 per cent of the cases, the headmasters pointed out that the school's development plan serves as a basis for preparing its budget. All these aspects can be connected with a school's strategic PM level. In some strategic issues, the opinions of headmasters were quite consistent with the opinions of teachers. For example, 93 per cent of the headmasters (87 per cent of the teachers) confirmed that the school's development plan included key performance indicators and there had been meetings to sum up the implementation of the school's development plan over the past years (87 per cent of the headmasters, 85 per cent of the teachers). These indicators reflect the particular dynamic nature of the planning and PM process. At the same time, as our analysis revealed, headmasters are much more oriented towards operational PM subjects than towards strategic performance subjects; this becomes especially evident when comparing their opinions with the opinions of teachers. The analysis also revealed that 36 per cent of the headmasters have no opinions concerning the sufficiency of financial resources needed to implement the school's development plan. Furthermore, the correlation between headmaster satisfaction and two strategic management indicators, i.e. "PM" and "communication with the stakeholders", is negative. Therefore, it can be argued that headmasters are not sufficiently aware of strategic performance and do not deem it important; this is also true in case of the strategic and financial management issues within the school's PM, although these areas are the headmasters' primary areas of responsibility.

5. Concluding remarks

This paper was written in response to a call for the study of PM development in public schools. Using the balanced PM approach and statistical analysis, this research paper studied how the general education schools in Estonia use elements of PM and whether there are certain links between the individual, operational and strategic levels of PM. Such an approach is interesting since different levels play different roles in the PM process used in the education sector. With its highly decentralised education system, Estonia is a fascinating example on which to investigate the implementation of PM in schools. Looking at various contingencies that influence this cycle, the paper explored how various drivers have interfered with the implementation of PM in public schools. Thus, the idea was to link the development of school PMS with the indicators influencing it. These empirical findings and this conceptual framework led to a number of observations.

First, the most significant variables indicating a school's performance are the results of state examinations, the satisfaction of the main stakeholders (parents, pupils, teachers) with the quality of education and teaching in the school, and the size of the school. The first indicator is strongly correlated with the pupils' choices related to their further education and therefore, also with their personal development, as well with the satisfaction of the main stakeholders (parents, pupils, and teachers) with the quality of education and teaching in the school. Thus, individual goals such as satisfaction with

the quality of education and teaching in the school are influenced by the academic performance of pupils. The latter also influences the pupils' further choices in education. This relationship could be explained by the fact that in Estonia, the results of state examinations receive extensive media coverage and various rankings of schools are published. Therefore, a school's accountability to its stakeholders has an important role to play – stakeholder satisfaction only reflects these aspects of an organisation's performance that the stakeholders have certain knowledge about.

Second, individual goals such as satisfaction with the quality of education and teaching in the school are influenced by the school's strategic as well as operational performance indicators. Therefore, it is important to emphasise that the schools' PMSs need to be balanced between individual, operational and strategic PM levels; otherwise, the objectives of different parities within a school and also the whole education system would be likely to conflict with each other and the goals of the entire organisations would be impossible to achieve.

Third, individual goals have a stronger connection with operational PM indicators, since the stakeholders, who do not have any management responsibilities, are not able to follow the strategic objectives of a school. However, the integration of PMs at the strategic and individual levels – the reflection of organisational goals in individual goals – is of key importance when implementing PM. Estonian schools lack the key features needed for successful PMSs: leadership, stakeholder commitment and PM culture. The latter depends on the willingness and openness of the managers of the organisation to accept new ideas, and the implementation of their accountability to stakeholders.

Fourth, headmaster satisfaction introduces the weakest connection (correlation) with operational and strategic management indicators. No strategic management indicators introduce statistically significant correlations with headmaster satisfaction regarding the quality of education and teaching in the school. The correlation between headmaster satisfaction and two strategic management indicators – “financial PM” and “communication with the stakeholders” – are even negative. In a more detailed analysis of the headmasters' answers to the questionnaire, it could be seen that none of the headmasters reported dissatisfaction with the quality of education and teaching in the school. Situations like these are very problematic, since in case of high satisfaction, it is doubtful that motivation for improvement can be found. Thus, although Estonian legislation has established a framework for integrated PM, its implementation is difficult if the people responsible for implementing it do not receive enough methodical advice and support.

Finally, it should be admitted that this exploratory study has certain limitations. First, it is static in nature. It would be useful to expand the survey while bearing in mind the more longitudinal aspects of the PM implemented in schools. It would also be necessary to further explore a wider variety of individual, operational and strategic PM indicators and their interconnections in the implementation of PM in public schools. Due to the limited interpretation possibilities of linear correlations, further research is needed.

References

- Anderson, B., MacDonald, D. and Sinnemann, C. (2003), “Can measurement of results help improve the performance of schools?”, paper presented at the Annual Meeting of the American Educational Research Association, Chicago, IL.

- Ascher, C. and Fruchter, N. (2001), "Teacher quality and student performance in New York city's low-performing schools", *Journal of Education for Students Placed at Risk*, Vol. 6 No. 3, pp. 199-214.
- Beck, L. and Murphy, J. (1998), "Sitebased management and school success: untangling the variables", *School Effectiveness and School Improvement*, Vol. 9 No. 4, pp. 349-57.
- Bititci, U.S., Carrie, A. and McDevitt, L. (1997), "Integrated performance measurement systems: an audit and development guide", *The TQM Magazine*, Vol. 9 No. 1.
- Bititci, U.S., Turner, T. and Begemann, C. (2000), "Dynamics of performance measurement systems", *International Journal of Operations & Production Management*, Vol. 20, pp. 692-704.
- Bosker, R.J. and Scheerens, J. (2000), "Publishing school performance data", *European Education*, Vol. 32 No. 3, pp. 12-30.
- Brenner, S.N. and Cochran, P. (1991), "The stakeholder theory of the firm: implications for business and society theory and research", in Mahon, J.F. (Ed.), *Proceedings of the International Association for Business and Society*, pp. 449-67.
- Brignall, S. and Modell, S. (2000), "An institutional perspective on performance measurement and management in the 'new public sector'", *Management Accounting Research*, Vol. 11, pp. 281-306.
- Brudan, A. (2010), "Rediscovering performance management: systems, learning and integration", *Measuring Business Excellence*, Vol. 14 No. 1, pp. 109-23.
- Cadez, S. and Guilding, C. (2008), "An exploratory investigation of an integrated contingency model of strategic management accounting", *Accounting, Organization and Society*, Vol. 33, pp. 836-63.
- Calton, J.M. (1993), "What is at stake in the stakeholder model?", in Ludwig, D.C. (Ed.), *Business and Society in a Changing World Order*, The Edwin Mellen Press, Lewiston, pp. 101-27.
- Cheng, Y.C. and Tam, W.M. (1997), "Multi-models of quality in education", *Quality Assurance in Education*, Vol. 5 No. 1, pp. 22-31.
- Chenhall, R.H. (2003), "Management control systems design within its organizational context: findings from contingency-based research and directions for the future", *Accounting Organizations and Society*, Vol. 28, pp. 127-68.
- Cronbach, L.J. (1951), "Coefficient alpha and the internal structure of tests", *Psychometrika*, Vol. 16, pp. 297-334.
- Currstine, T. (2005), "Performance information in the budget process: results of the OECD 2005 questionnaire", *OECD Journal on Budgeting*, Vol. 5 No. 2, pp. 87-131.
- Dempster, N., Freakley, M. and Parry, L. (2001), "The ethical climate of public schooling under new public management", *Internal Journal of Leadership in Education*, Vol. 4 No. 1, p. 12.
- DeVellis, R.F. (1991), *Scale Development*, Sage, Newbury Park, NJ.
- Eisenhardt, K.M. (1985), "Control: organizational and economic approaches", *Management Science*, Vol. 31 No. 2, pp. 134-49.
- Ferreira, A. and Otley, D. (2009), "The design and use of performance management systems: an extended framework for analysis", *Management Accounting Research*, Vol. 20, pp. 263-82.
- Freeman, R.E. (1984), *Strategic Management: A Stakeholder Approach*, Pitman, Boston, MA, 279 p.
- Fryer, K., Antony, J. and Ogden, S. (2009), "Performance management in the public sector", *International Journal of Public Sector Management*, Vol. 22 No. 6, pp. 478-98.

- Garengo, P., Biazzo, S. and Bititci, U.S. (2005), "Performance measurement systems in SMEs: a review for a research agenda", *International Journal of Management Reviews*, Vol. 7 No. 1, pp. 25-47.
- Gerdin, J. and Greve, J. (2004), "Forms of contingency fit in management accounting research – a critical review", *Accounting, Organizations and Society*, Vol. 29, pp. 303-26.
- Goodenow, C. and Grady, K.E. (1992), "The relationship of school belonging and friend's values to academic motivation among urban adolescent students", *Journal of Experimental Education*, Vol. 62, pp. 60-70.
- Greiling, D. (2006), "Performance measurement: a remedy for increasing the efficiency of public services?", *International Journal of Productivity and Performance Management*, Vol. 55 No. 6, pp. 448-65.
- Guthrie, J. and Parker, L. (1998), "A quarter of a century of performance auditing in the Federal Australian public sector: a malleable masque", *ANZAM Proceedings*.
- Hanushek, E.A. (1986), "The economics of schooling: production and efficiency in public schools", *Journal of Economic Literature*, Vol. 24 No. 3, pp. 1141-77.
- Hanushek, E.A. (2005), "The economics of school quality", *German Economic Review*, Vol. 6 No. 3, pp. 269-86.
- Hood, C. (1995), "Contemporary public management: a global paradigm?", *Public Policy and Administration*, Vol. 10 No. 2, pp. 21-30.
- Horváth, P., Moeller, K. and Schwab, C. (2006), "Value-added services in German industrial companies – a study of the implications for management accounting", paper presented at 29 Annual Congress of European Accounting Association, March, Dublin, Ireland.
- Irs, R. and Ploom, K. (2009), "Enhancing the performance of Estonian primary schools via evaluation", in Petter, R., Barsauskas, P., Chmieliauskas, A., Kundrotas, V. and Pundziene, A. (Eds), *Insights into the Sustainable Growth of Business*, Emerald, Bradford, pp. 1-14.
- Kaplan, R. and Norton, D. (1992), "The balanced scorecard: the measures that drive performance", *Harvard Business Review*, January-February, pp. 71-9.
- Karatzias, A., Power, K.G. and Swanson, V. (2001), "Quality of school life: development and preliminary standardisation of an instrument based on performance indicators in Scottish secondary schools", *School Effectiveness and School Improvement*, Vol. 12 No. 3, pp. 265-84.
- Kim, J.O. and Mueller, C.W. (1978), *Introduction to Factor Analysis: What It Is and How to Do It*, Sage, Beverly Hills, CA.
- Krantz, D.H., Luce, R.D., Suppes, P. and Tversky, A. (1971), "Foundations of measurement", *Additive and Polynomial Representations*, Vol. 1, Academic Press, New York, NY, p. 482.
- Lapsley, I. (2008), "The NPM agenda: back to the future", *Financial Accountability & Management*, Vol. 24 No. 1, pp. 77-96.
- Levacic, R. (2008), "Financing schools: evolving patterns of autonomy and control", *Educational Management Administration & Leadership*, Vol. 36, pp. 221-34.
- Lockheed, M. and Hanushek, E. (1994), "Concepts of educational efficiency and effectiveness", Human Resources Development and Operations Policy Working Papers, 19 pp.
- Mahama, H. (2006), "Management control systems, cooperation and performance in strategic supply relationships: a survey in the mines", *Management Accounting Research*, Vol. 17, pp. 315-39.
- Modell, S. (2004), "Performance measurement myths in the public sector: a research note", *Financial Accountability & Management*, Vol. 20, pp. 39-55.
- Mussari, R. (2001), *Controllo di Gestione: Best Practices*, Rubettino, Soveria Mannelli.

- Näsi, J. (1995), *Understanding Stakeholder Thinking*, LSR Publications, Helsinki.
- Neely, A., Mills, J., Richards, H., Gregory, M., Bourne, J. and Kennerley, M. (2000), "Performance measurement system design: developing and testing a process-based approach", *International Journal of Operations and Production Management*, Vol. 20, pp. 1119-45.
- OECD (2007), *Performance Budgeting in OECD Countries*, OECD, Paris.
- OECD (2008), *Education at a Glance 2008*, OECD, Paris.
- Pollitt, C. and Summa, H. (1997), "Trajectories of reform: management change in four countries", *Public Money and Management*, Vol. 17 No. 1, pp. 7-18.
- Stringer, C. (2007), "Empirical performance management research: observations from AOS and MAR", *Qualitative Research in Accounting and Management*, Vol. 4 No. 2, pp. 92-114.
- Ter Bogt, H. (2001), "Politicians and output-oriented performance evaluation in municipalities", *The European Accounting Review*, Vol. 10 No. 3, pp. 621-43.
- Tolifari, S. (2005), "New public management and education", *Policy Futures in Education*, Vol. 3 No. 1, pp. 75-89.
- Webb, R. and Vulliamy, G. (1998), "External inspection or school self-evaluation? A comparative analysis of policy and practice in primary schools in England and Finland", *British Educational Research Journal*, Vol. 24 No. 5, pp. 539-57.
- Wehlage, G.G., Rutter, R.A., Smit, G.A., Lesko, N. and Fernandez, R.R. (1989), *Reducing the Risk: Schools as Communities of Support*, The Falmer Press, New York, NY.
- Windsor, D. (1992), "Stakeholder management in multinational enterprises", in Brenner, S.N. and Waddock, S.A. (Eds), *Proceedings of the Third Annual Meeting of the International Association for Business and Society*, pp. 121-8.
- Wößmann, L., Lüdemann, E., Schütz, G. and West, M. (2007), "School accountability, autonomy, choice, and the level of student achievement – international evidence from PISA 2003", OECD Education Working Papers, 13, OECD, Paris, 86.
- Woods, P.A. and Levačić, R. (2002), "Raising school performance in the league tables (Part 2): barriers to responsiveness in three disadvantaged schools", *British Educational Research Journal*, Vol. 28 No. 2, pp. 227-47.

Further reading

- Berry, F.S. and Wechsler, B. (1995), "State agencies' experience with strategic planning: findings from national survey", *Public Administration Review*, Vol. 55 No. 2, pp. 159-68.
- Leithwood, K., Louis, K.S., Anderson, S. and Wahlstrom, K. (2004), *How Leadership Influences Student Learning, Review of Research Learning from Leadership Project*, University of Minnesota Center for Applied Research and Educational Improvement, University of Toronto Ontario Institute for Studies in Education, Ontario.
- Niskala, M. and Näsi, S. (1994), "Stakeholder theory as a framework for accounting", in Näsi, J. (Ed.), *Understanding Stakeholder Thinking*, LSR Publications, Helsinki.
- OECD (2005), *Modernising Government, The Way Forward*, Paris.

Appendix 1

Balanced
performance
management

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Section in the initial questionnaire	Indicator	Cronbach's α
Strategic management	(1) Dynamic strategic planning *	0.778
	(2) Communication with the stakeholders *	0.626
	(3) Ethics, open communication *	0.750
	(4) Existence of a long-term development plan	0.467
	(5) Bargaining for the stakeholders' opinions in management and development decisions	0.892
	(6) Active communication with the external environment	0.775
Resource management and collaboration with the stakeholders	(1) Financial PM *	0.545
	(2) Systematic analysis and development of main resources	0.658
	(3) Usage of the resources based on the development plan	0.828
	(4) Taking the stakeholders' opinions into account when planning expenditures	0.727
	(5) The good knowledge of the stakeholders' about the structure of actual expenditure	0.587
	(6) Existence of problems related to financial management caused by the local government	0.392
Learning processes and quality management	(1) Satisfaction regarding the quality of teaching and education *	0.811
	(2) Supportive culture in the school *	0.878
	(3) Expected good academic performance *	0.591
	(4) Attention paid to the interests of pupils *	0.884
	(5) Adopting an individual approach to pupils in teaching and evaluating performance	0.725
School performance evaluation	(1) Systematic evaluation and analysis of pupil performance *	0.529
	(2) Systematic evaluation and analysis of school expenditures	0.709
	(3) Systematic evaluation and analysis of stakeholder satisfaction with the school	0.817
	(4) Systematic evaluation and analysis of teaching quality	0.643
	(5) Systematic evaluation and analysis of the learning and teaching environment	0.544
	(6) Systematic evaluation and analysis of the poor academic performance of pupils	0.787
	(7) Systematic evaluation and analysis of the performance of the school as a whole compared to other schools	0.711

Notes: ^aNine main indicators analysed in this paper; indicators that introduced significant (at $p \leq 0.01$) and strong correlations with the indicator "satisfaction regarding the quality of teaching and education"

Table AI.
24 indicators defined on the basis of the results of the questionnaire

Indicator	Statement in the initial questionnaire
Satisfaction regarding the quality of teaching and education	(1) I am satisfied with the quality of education provided in our school (2) I am satisfied with the quality of teaching in our school
Supportive culture in the school	(1) Pupils like to go to school (2) Pupils follow the rules established in our school (3) The teachers in our school care about the pupils (4) The teachers in our school are fair to the pupils (5) In our school, pupils can always talk about their problems with teachers (6) The pupils in our school treat each other well
Expected good academic performance	(1) Our school supports pupil participation in different contests, Olympiads, etc (2) The pupils in our school are encouraged to do their best in their work
Attention paid to the interests of pupils	(1) The pupils in our school understand what teachers expect from them (2) In our school, the pupils study what they need in order to achieve success in later life (3) Our school offers sufficient support in developing the interests and talents of the pupils (4) In our school, non-compulsory subjects are provided in accordance with the interests and wishes of the pupils (5) When planning the school's timetable and activities, the preferences and proposals of the pupils are taken into account (6) The teachers in our school use sufficiently contemporary teaching methods (i.e. computer-based, identity-centred)
Financial PM	(1) The school's management has enough authority to use the school's own revenues (i.e. rental payments for using the pool or gymnasium) (2) The school's collaboration with the local government in terms of the school's financial management is very good (3) The delegates of the local government take part in preparing the school's budget (4) The amount of financial support allocated to the school from the state budget is compared to the amount of finances allocated to the school from the budget of the local government (5) The school's premises and buildings can be used by other interest groups outside the school's working hours
Dynamic strategic planning	(1) During the past year, the enforcement of the school's development plans has been analysed (2) During the past two school years, the enforcement of the school's development plan has been introduced to different interest groups (parents, local government) (3) The school's key result indicators have been defined in the development plan (4) The school's development plan has been adjusted during the past year (5) Changes in the everyday life of our school are based on the analyses of previous activities

Table AII.
Nine main indicators analysed in this paper and the corresponding statements in the initial questionnaire

(continued)

Indicator	Statement in the initial questionnaire
	(6) The developments of the society (number of children in the region, expectations towards the school, economic environment, the region's development plans, etc.) are taken into account when planning the school's activities
Communication with the stakeholders	(1) When requested, our school provides information to the local government (2) When requested, our school provides information to the parents (3) When requested, our school provides information to the pupils (4) When requested, our school provides information to the teachers (5) When requested, our school provides information to the members of the school board
Ethics, open communication	(1) The management of our school follows ethical standards and principles (2) The teachers of our school follow ethical standards and principles (3) Communicating with our school's management is straightforward
Systematic evaluation of pupil performance	(1) In our school, the impact of supporting facilities on the learning success of pupils is systematically analysed (2) In our school, the share of pupils continuing their studies after graduating from our school is systematically analysed

Appendix 3

List of abbreviations used in the paper:

EEIS – Estonian Education Information System

NPM – New Public Management

OECD – Organisation for Economic Co-operation and Development

PM – Performance Management

PMS – Performance Management System

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