

In search of performance and efficiency: The diffusion of management accounting innovations in a local government setting

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Abstract

New public management is concerned with the transformation of public sector by introducing new demands such as the accountability of managers, quality of the supplied services and efficiency in the use of taxpayers' money. An important part of new public management agenda is therefore concerned with introducing new management accounting methods, termed management accounting innovations. While most related studies tend to focus on the attributes leading to good implementation and adoption of such management technologies, the questions here concern whether these innovations, primarily derived from the private sector, also are applicable and used to the public sector domain. Through a questionnaire survey based on 290 respondents, this paper enlightens our knowledge of the adoption of general management accounting practices, cost assignment practices, measures of user service, benchmarking and measures of projects. This analysis is conducted through the use of regression analysis, factor analysis and supplementary descriptive statistics. Finally, correlation is employed to illustrate the structures between key variables. The results show that the degree of knowledge concerning new management accounting innovations (ABC, BSC, Intellectual capital, TQM etc.) are fairly differentiated and there indeed is a positive association between the key variables such. Besides, several comments from the respondents show that the adoptions of now accounting innovations are increasing.

1 Introduction

New public management (NPM) is concerned with the transformation of public sector from the realm of bureaucracy to responsive management (Lapsley *et al.* 2002). Among multiple responses to such an agenda is the introduction of new technologies of management to the public sector. Such management accounting innovations, for the most part directly transferred from private sector without major alterations, bring with them a set of entirely different perspectives on organisational functioning and performance. According to Habersam *et al.* (2005), NPM for example introduces performance measures for improved accountability of managerial decisions and actions into the public sector (see also Budding 2004). Another major facet instigating NPM developments has been pressure on the public sector to increase efficiency and effectiveness so as to reduce demands on taxpayers while maintaining the volume and quality of the services supplied (Brignall & Modell 2000).

Overall, the NPM debate can be cornered to a quest creating a public sector that performs more in terms of private organizations than in terms of the stereotypical view of local authorities as inefficient wasters of taxpayers' money. A key aspect of NPM is therefore concerned with introducing new management accounting techniques, i.e. management accounting innovations, devised for and applied in the private sector to the public sector domain. The underlying rationale seems to be that the transfer of private sector best practices to the public sector will enable better management and greater efficiency. For the most part, the role of management accounting innovations in relation to efficiency is related to aspects such as creating cost structure transparency, transparency in relation to outsourcing decisions, quality of the supplied services and, of course, proper use of taxpayers' money.

In the public domain, there has in recent years been rising pressure for transparency in public administration practices and resource allocations. In some countries this is due to corruption and other scandals, in others due to relatively high tax-rates. In the Scandinavian context, taxes represent the greatest problem. The public debate continually questions whether the benefits of a large public sector outweigh the bureaucratic costs and whether tax money is spent in a proper manner.

While most related studies of management accounting innovations in the public sector domain tend to focus on the attributes and characteristics that lead to effective

implementations and adoptions of techniques, the question of whether such management accounting innovations derived from private sector research are applicable to the public sector remain. Through a survey of the adoption of management accounting innovations in a local government setting, this paper enlightens our knowledge of the key question at hand: Do these transformation and adoptions make any difference at all, how are they understood and used?

In a recent review of the role of management accounting in the transformation of the public sector, Van Helden (2005) argues that the degree of new management accounting techniques introduced and their achieved impacts are control factors of the level of NPM adoption. Therefore our contribution relates not only to the performance and efficiency of the local governments, but also acts as a proxy for the adoption of NPM practices. Lapsley & Wright (2005), offer a valuable contribution to the research agenda concerning the diffusion of management accounting innovations in the public sector. With the aim of exploring the means and manners of diffusion of management accounting practices within the new public sector, they apply a survey instrument. Their study seems to indicate that the adoptions of management accounting innovations are influenced by government initiatives.

Lapsley (1996) argues that the rationale for performance measurement in the public sector can be traced to fiscal pressures, perceived inefficiencies of the public sector, the dependency culture of a nation too reliant on the public purse, and finally, the absence of managerial incentives and clearly defined commercial objectives. It is this final rationale that forms the basis of our pondering. We shed further light on the characteristics which entail the diffusion of management accounting innovations in the public sector, thereby offering a contribution to the calls made by Lapsley & Wright (2004, 372).

The structure of the article is as follows: Section 2 provides a review of prior literature on NPM that in total constitute our statistical analysis. Section 3 describes research on management accounting innovations, including innovations in the public sector. In section 4 we describe our research methodology. The statistical analysis and findings obtained from the study are presented and discussed in section 5 together with some qualitative comments from the respondents. Summary and conclusions are made in section 6 together with avenues for future research.

2 New Public Management

In general, Hood (1995) is perceived as a seminal contribution to NPM theory and he argues that it was the inherent changes to public sector accounting practices that gave rise to NPM. In the words of Hood (1995), NPM includes doctrines of public accountability (public pressure) and organizational best practice (rationalization). In continuation of this, Mouritsen *et al.* (2004, 380), corroborate that NPM inherently was a transformation of public institutions in the name of management control. Thus NPM can be said to be concerned with companyization (Brunsson 1994) and accountingization (Power & Laughlin 1992, 133) of the public sector. Osborne & Gaebler (1994) argue that this in effect means that the public institution is reinvention so that it becomes accountable to a budget, as well as measures of productivity and customer satisfaction.

While there to some extent is consensus concerning the fact that NPM is a global phenomenon, there seems to be considerable variations to the adoption of NPM across countries (cf. Hood 1995; Lapsley *et al.* 2002). This could indicate that NPM does not *per se* constitute a theory, but rather a collection of reforms and initiatives in the public sector. We could label it a *movement* of public sector management. Together with Hood's seminal contributions (1992, 1995), Pollitt & Boukaert (2000) acknowledge two tendencies in relation to public sector reforms, namely administrative reforms and institutional reforms. Administrative reforms relate primarily to the decentralisation of responsibility and the introduction of performance measurement regimes focused on results. On the other hand, institutional reforms are found to relate to the organization of responsibility centers and the unlinking of ordering and production, e.g. through such mechanisms as outsourcing of jobs to private sector companies, i.e. privatization.

According to Budding (2004), NPM relates to the performance and accountability of government, and in due course places greater emphasis on measuring the performance of subunits. Thus, NPM is equal to greater accountability, for instance by holding managers accountable for results. Much literature, e.g. Brignall & Modell (2000), argues that essentially it is pressure from the taxpayers that rallies for greater accountability. While much literature looks at NPM initiatives as a government level problem, there also exist a number of contributions that take the perspective of the local governments. Here too, taxpayers' pressures are important influences on the adoption of

accountability schemes. Therefore, in the next section we turn to the local government setting.

2.1 The role of accounting in local government change

Lapsley et al. (2002) study local government change in New Zealand and Scotland. They argue that the movement from bureaucracy to responsive management will need a change of both organizational cultures and the management tools applied in the organisation. Through their study, Lapsley *et al.* (2002) draw the case that there are five characteristics to NPM in the local government setting, namely:

- Support devolved management responsibilities
- Outsourcing rather than just service provision
- Viewing the citizen as a customer
- Rejection of short-terminism
- Promotion of corporate perspective rather than narrow departmental interests

While the above characteristics primarily relate to managerial and cultural values, there seems to be three archetypes of change in connection with local government reform, namely structural, organizational and processual change. In all three cases, management accounting can play a role. Van Helden (2005) studies the role of management accounting in relation to public sector transformation, probing into the question of which extent public sector management accounting research refers to various levels of NPM adoption, such as introduced techniques and achieved impacts. Van Helden (2005) concluded that after a local government reform leading to improved autonomization, financial management improved to some extent, but real changes in the economic management were only minor.

Is performance measurement and management in the public sector therefore a myth? This question is posed by Modell (2004, 39), who argues that although NPM often is coupled to a strategic multidimensional approach to performance measurement, in practice, it seems to be characterized more by reliance on quantitative accounting-based indicators as a means of technology for achieving a greater degree of management control. Therefore, it is the aim of this study to investigate how a series of new

performance measurement solutions are embedded and applied in local government organizations at both a practical and a conceptual level.

2.2 Diffusion of management accounting innovations

Innovations in management accounting techniques have been many over the past couple of decades. To some extent we can trace these back to the seminal paper by Eccles in the HBR in 1991 entitled “The Performance Measurement Manifesto”. Also, Johnsen & Kaplan’s (1987) book, *relevance lost*, marked a turn for management accounting thinking. Together, the two contributions above to a great extent led the discussions forming the thought of the Balanced Scorecard and Activity-Based Costing. Much research has heralded the diffusion and effects of such performance measurement approaches, arguing that performance management through them has become more salient and transparent.

The question therefore poses itself: Why shouldn’t the public sector also be able to profit from these innovations too? We are therefore in this study in part concerned with the diffusion of management accounting innovations from private sector to the public sector. In general, new performance measurement innovations are connected with a new value set. According to Broadbent (1995), introducing new accounting techniques also means introducing a new metaphor of reality which represents a particular value set. In the public sector, and strongly correlated with the NPM agenda, this metaphor can be viewed as a metaphor of rationalization, efficiency and customer/service orientation towards the citizens. Management accounting innovations can possibly play an important role in effectuating such agendas because they create transparency around the mentioned agendas.

However, Brignall & Modell (2000) seem to argue that caution should be taken with direct transfer of private sector management accounting innovations to the public domain. Exploring the implications of institutional theory for the successful implementation of multidimensional performance measurement and management in the public sector, Brignall & Modell (2000) provide a framework addressing the impacts of the interplay between funders, professional groups within the focal provider organization and the purchasers of its services on the design and implementation of multidimensional PMS’s in the public sector.

3 Research on management accounting innovations

In the section above, it was suggested that management accounting innovations were able to create new visibilities concerning service quality, efficiency and performance. Along these lines relating to the possible contribution of management accounting innovations, Kennedy & Affleck-Graves (2001), conclude that firms adopting Activity-Based Costing significantly outperform similar firms because this particular management accounting innovation helps with cost controls and better assets utilization.

Lapsley & Mitchell 1996 provide a seminal review of the accounting challenge associated with performance measurement in the private and public sectors. In relation to the effects of the introduction of new performance measurement systems, Tuomela (2005) illustrates how the introduction of new performance measurement systems assert interplay of different levers of control, namely that they have the ability to be used both diagnostically and interactively.

An example of diagnostic use is in the calculation of where the organization can be made more efficient, while an interactive control would entail continuous improvement. The question poses itself, is economic efficiency really all that counts? Drennan & Kelly (2002) study the implementation of system changes such as the introduction of activity-based costing systems, and find that although they are often founded largely on a presumption that the motivation for the innovation is economic, even abandoned projects can be successful for the organization in terms of institutional motivations and effects on group behaviour.

It seems to be a pre-existing orientation of performance measurement in the private sector that integrative information may have beneficial effects. Chenhall (2004), in discussing this relationship, finds that so-called integrative performance measurement innovation to a great extent are concerned with visualizing organisations' strategic and operational linkages, and illustrating customer and supplier orientation. Further, Mouritsen & Larsen (2005) argue that a broader conception of management control is needed. Perhaps it can be argued that this is especially the case in the public sector where products are mainly knowledge-based services. Such notions are very much in line with the NPM agenda, as Mouritsen & Larsen (2005) suggest that the management control of knowledge resources are related to questions of economizing, organizing and modularizing them.

3.1 Management accounting innovations in the public sector

In a recent contribution, Lapsley & Wright (2004) conduct a survey of the diffusion of management accounting innovations in the public sector. Their survey focuses on the UK public sector and is based on a survey of financial managers. Lapsley & Wright (2004) conclude that state government had a major influence on the move towards management accounting innovations. We shed further light on the characteristics which entail the diffusion of management accounting innovations in the public sector. According to Rogers' (1995) work on diffusion theory, it is important to differ between adoption and deployment of new models and techniques. This is because managerial responses to institutional pressures such as the deployment of a new performance measurement practice may hinder its success (Oliver 1991), whereas the voluntary adoption more likely will be followed through with success in the organisation. Therefore, this study takes into account the degree to which higher level government has pushed certain views of organisation and performance measurement through to the local government setting.

In a study of provincial government in Canada, Townley *et al.* (2003) examine the relationships between performance measures and the dimensions of rationalization of organizations. They find that the implementation of management accounting innovations are to a large extent connected to a pursuit of reason in human affairs and an increasing dominance of a means-end instrumentality. According to Kloot & Martin (2000), local government has traditionally been concerned with measuring the delivery of primary objectives, i.e. results, at the expense of secondary objective, i.e. the means and determinants of organizational performance. The arguments posed here are that traditionally too less attention is paid towards determinants of organizational performance, i.e. long-term oriented strategic measures such as, organizational improvement in internal business processes, innovation and learning. Although it may be of great importance to the management of any type of organization, the problem here seems to be the lack of technologies in place to measure such aspects as the determinants of organizational performance.

The question remains however, can management technologies invented in the private sphere be transferred to the public sector domain? Bourguignon *et al.* (2004), suggest that strategic performance measurement systems must be coherent with the culture and

local ideologies of the organizations in which they are implemented. This implies that at least that we must be aware of problems in transferring new ideologies into settings where they do not belong. In relation to this, Modell (2001), studies managerial responses to public sector reform, and concludes that the properties of institutional processes associated with public sector reform impinge on the extent of proactive choice exercised by senior management.

Llewellyn (1996) explores the issues around the meaning and measurement of performance in the social services and argues that the inherent difficulties of performance evaluation in this domain are fostering the use of efficiency rather than effectiveness measures. In this manner, Llewellyn argues for the introduction of management accounting technologies that are able to illustrate more of the aspects relating to the value creation process of the public sector. However, since effectiveness is the holy grail of accounting measures of performance (Small 1996), we can insinuate that efficiency measures and process measures are lacking in the public sector.

Whereas most studies examine the implementation of government initiatives, Arnaboldi & Lapsley (2004) conduct a study of a public organization implementing a new management accounting system in the absence of central government guidance. Their conclusions suggest that the implementation of modern costing innovations play an important role in legitimizing structural reforms. Here adoption becomes an important referent, as a legitimization exercise, where the organization shows itself as modern

4 Research Methodology

4.1 Design of the Questionnaire

In the first part of the question, the respondents have been asked to give some background information concerning different areas within the public company, the number of employees, the yearly permission within the organisation, the position the respondent holds in the organisation, public section affiliation, educational background, and their seniority within the organisation. They were also encouraged to give their personal comments on each group of questions.

The design ensures that the study includes a proportion of different work areas that have different levels of knowledge and or varying levels of knowledge and backgrounds

(Chenhall, 1997). The awareness of a given practice or technique can be described as a four-phase stepwise process. There may be several reasons why a department or a public institution adopts a new management or accounting practice. These may be dissatisfied with their existing management systems, insignificant transparency of expenses and costs, increased pressure from above or just fads and fashions (Abrahamson, 1991; Bjørnenak, 1997; Kaplan, 1998; Malmi, 1999).

4.2 Sample and Data Collection

An electronically administered questionnaire was issued to about 1.000 respondents mostly managers and key employees in the Danish public sector. The questionnaire contained 124 questions and the use of the *NSurvey* software enabled viewing of the length of time to used by each respondent to complete the questionnaire, thereby making it possible to reject responses that were obviously completed hastily. We constructed a 3-phase questionnaire encompassing ca. 80 questions. We used a web-based survey program was used to collect information and data.

A total of 349 or 38 percent responses were received, 40 of which were “blanks” in the sense that an electronic response from the particular respondent was registered but no actual answers were given from that respondent. Furthermore, 23 responses were deemed unusable due to an excessive proportion of answers in the “Don’t know” category resulting in 286 usable responses yielding a usable response rate of about 30 percent. The agenda in the management of the local governments and municipalities is to move from expensing to costing and cost allocations. There also a large political pressure to move to more transparency and more efficiency and better utilization of resources. Now, one of the greatest changes has emerge in the Danish areas within the local settings. A new reform is implemented that also changer several normal ideas and areas.

The population was defined as public areas located in Denmark in 2004. Size, often described as the number of employees, is a variable, which is considered a determinant of the organisational complexity of an organisation (Merchant, 1984) and used in surveys (Ask & Ax, 1992; Guilding *et al.* (2000). A pilot test was undertaken with a group of respondents to refine the questionnaire.

For most surveys, generally, non-response is potentially one of the most important sources of systematic error (Fawler, 1988; Ticehurst & Veal, 2000). As pointed out by Suddan (1980), *'researchers have known for a long time that the answers that they get may be subject to substantial reporting errors, so the activity today is focused on reducing these errors'*.

The non-response problem is, however, treated rather differently. One procedure may be to contact the non-respondents to find out the reason for their missing answers and secondly conduct a statistical test by comparing data provided by 'first' mailing respondents and 'second mailing' respondents (Chenhall & Langfield-Smith; 1998; Guilding *et al.*; 2000). Another is to test the characteristics of responding units against the characteristics of the 'theoretical sample' to find out if response bias with respect to unit size or industry is different (Lukka & Granlund; 1996). In general, there is no agreement on a standard for a minimum acceptable response rate (Fawler, 1988) but questions must be raised as to their validity when 60 percent or more of the target sample is not represented (Ticehurst & Veal, 2000). There are several ways to reduce the number of non-respondents, e.g. by using more personalized contact (Dillman, 1991). Instead of using a simple random sampling the researcher might choose to use another selecting procedure (Wannacott & Wannacott, 1972). An alternative is to use of 'panel data' techniques, small-sample inferences, e.g. Monte Carlo methods or re-sampling methods, e.g. jackknife or bootstrapping, or the use of non-parametric statistics for small samples (Maddala, 2001; Wold, 1980).

5 Results and discussion

5.1 Statistical analysis and results

This section provides the details of the actual analysis undertaken and the results following therefrom. The analysis is structured in such a way that the 4 main areas of the questionnaire, namely general management accounting practices, cost assignment practices, measures of user service, and measures of projects are first analyzed separately, mainly through the use of regression analysis. Thereafter, descriptive statistics concerning, degree of knowledge, usage, and different areas within the questionnaire are shown. After that, we have conducted a factor analysis for different statements (or items) in the questionnaire to see if these statements also are correlated

with the concerned accounting model. We also use a two-way analysis of variance to see if the size of the organisation has an influence on qualification of the employees. And finally, we have check if there is any significant correlations between the 4 mentioned areas in the first part of the analysis.

5.1.1 Separately analysis of the four main areas

A common denominator for each of the regression analyses carried out is the use of dummy variables to illustrate the possible effect of the size of the public entity on the various dependent variables. As a proxy for size, the number of employees in the entity was used but the possible bias from asking respondents to state the exact number of employees in the entity led to the use of an ordinal scale which was subsequently re-coded into three dummy variables according the size limits in the Danish equivalent to the Generally Accepted Accounting Principles (GAAP). Thus, entities employing less than 50 people were categorized as *small entities*; entities employing between 50 and 249 people were categorized as *medium-sized entities*; and entities employing 250 or more people were categorized as *large entities*.

		Coefficients	
Dependent Variable	The importance of non-financial measures relative to financial measures	-	<i>Sig.</i>
	<i>Constant</i>	3,399	0,000
Predictors	Degree to which the measures used are linked to the entity's overall challenges	0,309	0,000
	Degree to which the entity's budgeting process is strictly fixed and without autonomy used are linked to the entity's overall challenges	0,125	0,018
R square	0,11		

Table 1: General management accounting practices (Part 1 in questionnaire)

Table 1 illustrates the results of the regression analysis concerning the general management accounting practices of the entities. As can be seen, statistically significant positive relationship between the importance of non-financial measures relative to financial measures and both (1) the degree to which the measures used are linked to the entity's overall challenges (significant at the 0.001 level); and (2) the degree to which the entity's budgeting process is strictly fixed and without autonomy (significant at the 0.05 level). The sign of this second relationship seems somewhat surprising as one

might expect increased autonomy (a low score on the variable in question) to be related to an increased importance of non-financial measures as part of a need for further controls in a more decentralized entity (Anthony and Govindarajan, 2003). That is, a negative relationship was expected. A tentative explanation for the actual positive relationship found, however, could be some underlying tendency for some, or all, of the entities examined to increasingly focus on management control in general, thereby expending a greater effort on both budgetary and non-financial control. In a cross-sectional analysis as the one carried out, such an underlying and more general tendency could easily be the cause of the relationship found.

Table 2 shows the hierarchically reduced regression model for the area regarding cost assignment practices. As expected, positive relationships were found between the extent to which the entity is able to compute the costs of each product or service and (1) the ability to assign direct labour and direct materials to services; and (2) the extent to which indirect costs are allocated or assigned across services (both significant at the 0.001 level).

		Coefficients	
Dependent Variable	Extent to which the entity is able to compute the costs of each product or service	-	<i>Sig.</i>
	<i>Constant</i>	1,518	0,000
	Small public entities (dummy variable)	-0,37	0,063
Predictors	The ability to assign direct labour and direct materials to services	0,362	0,000
	The extent to which indirect costs are allocated/assigned across services	0,277	0,000
R square	0,302		

Table 2: Cost assignment practices (Part 2 in questionnaire)

Furthermore, small public entities were, not surprisingly, found to exhibit less of an ability compute the costs of each product and service (significant at the 0.10 level) which can probably be attributed to prohibitively less advantageous cost-benefit trade-offs from implementing extensive cost accounting systems in relatively small entities.

		Coefficients	
Dependent Variable	Service targets are central to our organisation	-	<i>Sig.</i>
	<i>Constant</i>	3,033	0,000
Predictors	The degree to which measurements related to citizen/user satisfaction with the provided services are employed	0,009	N/S
	The degree to which measurements of the users' access to the organisation and employees with information technology are employed	0,083	N/S
	The degree to which effect measurements of the users' perceived quality are employed	0,391	0,000
R square	0,217		

Table 3: Measures of customer/user service (Part 4 in questionnaire)

In Table 3, the results regarding measurements of user service are given. Quite notably, only one statistically significant relationship was found, being the one between the extent to which service measurements are central indicators to the entity (dependent variable) and the degree to which effect measurements of the users' perceived quality are employed.

		Coefficients	
Dependent Variable	Degree of perceived importance of project management	-	<i>Sig.</i>
	<i>Constant</i>	2,18	0,000
Predictors	The ability to assign measurements to the project level	0,309	0,000
	The degree to which non-financial measurements are used In connection with project management	0,356	0,000
R square	0,29		

Table 4: Measures of projects (Part 5 in questionnaire)

Finally, the results on project measurements are given in Table 4. Again, the relationships found correspond with what could be expected. Thus, the degree of perceived importance of project management is positively related to (1) the ability to assign measurements to the project level; and (2) the degree to which non-financial measurements are used in connection with project management. With regards to the second relationship which might require some further explanation, one would thus expect that an increased use of non-financial project management measurements would signal a heightened importance of project management in the entity, as the data seems to suggest.

A few points should be made regarding the assumptions of the regression analyses carried out. Firstly, the variables used are all ordinaly scaled whereas regression analysis actually assumes variables on an interval scale. However, 7 point Likert scales such as the ones employed can generally be assumed to be on an interval scale (Hair *et al.* 1998). Furthermore, the regression assumption of homoscedastic error terms was found to be violated when employing the Lagrange-Multiplier test for heteroscedasticity. The consequences of heteroscedastic error terms are unreliable standard errors of the regression coefficients leading to unreliable P-values for the corresponding hypothesis tests of whether the relevant regression coefficients are different from 0. However, as can be seen in the above tables, the majority of the regression coefficients are significantly different from 0 at the 0.001 level. Also, it should be noted that the coefficients of determination (R^2) of the above regression analyses are fairly low. However, it is generally accepted that a regression model should not be assessed based solely on its coefficient of determination (Chenhall, 2004).

5.1.2 Descriptive statistics

To obtain further insights into the management accounting practices in Danish public entities, descriptive statistics on both the familiarity with and usage of various management accounting practices have been computed (refer to Tables 5 and 6, respectively). A simple model relation to learning an implementation is shown in figure 1 and based on established theories related to organizational and individual learning (March & Olson, 1988; Stewart, 1997). In general, organizational learning refers to the process taking place in an organization, given its circumstances and culture, to build and ameliorate its knowledge and management systems, to adapt and compete, by using various tools and methods (Argyris & Schon, 1978).

Our base model is shown in figure 1.

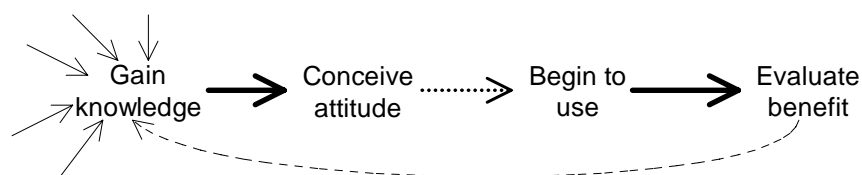


Figure 1: A stepwise process of awareness on which the questionnaire is based

At the first stage, the level of knowledge of the management model has to be gained. This knowledge is generated within the company by a number of people who gain their knowledge from multiple sources: education, business newspapers, periodicals, journals, conversations with other municipal employees, associates at the golf course, discussions with consultants, etc. But before this first, the government managers have to discover predict or be aware of unfolding changes or problems internally and what opportunities this may reveal. Trying to understand the supply of management accounting innovation in a municipal setting, researchers should also pay more attention to those engaged in propagating these practices to potential adopters (Ax & Bjørnenak, 2005). Both private companies and municipal public authorities spend a lot of money and time on attracting consultants for these cost management innovations (Jönsson, 2005), even though, that the bottom line effect is difficult to quantify. But if the practice is implemented, the implementation process and the evaluation of the practice will probably contribute to the knowledge gained about these practices.

In the second stage, the knowledge gained will form part of the input on which the people or employees build or create an attitude towards an accounting practice. If the perception of the concept is positive and an implementation is found to be valuable, the concept will be considered and a team will design and evaluate where and how the model should be designed and used. Selection of considerations will be done among the various practices to deal with the challengers in step one.

In the third stage, the decision will be executed and the practice will be implemented in some form. And finally, in the fourth stage, the model should be rooted in the organisation or part of that. The benefit from using one or more practices could first be evaluated after a considerable period. Stage one and two relate to the adoption, whereas stage three and four relate to the implementation and benefit of the practice. However, tracking benefits and drawbacks from 'knowledge' to 'usage and benefit' is not the issue here. To use the organizational learning system efficiently, several different management tools exist such as employee survey system, scenario planning, system thinking etc. (Chen, 2005).

For each of the five practices and one specific model know as the 'Aarhus Model', the respondents have been asked to express their opinions about statements concerning

three items; knowledge, priority, and the benefit. A Likert *scales ranging from yes to no* has been used to measure the items. Weights of 1 to 7 have been assigned to the scale.

As can be seen, the familiarity with Activity Based Costing (ABC), the Balanced Scorecard (BSC), Intellectual Capital Statements (IC), the Business Excellence model or Common Asset Framework (BE), and Total Quality Management (TQM) is fairly differentiated. Thus, for both ABC and BE approximately half of the respondents have indicated the highest possible level of familiarity with the particular concepts whereas the answers are distributed somewhat more evenly across the 7 point scale for BSC and IC, with the distribution of the TQM answers being more of a hybrid between the first two mentioned pairs of distributions. Noteworthy is it, therefore, that BSC and IC, with which familiarity has been found to be fairly widespread in the Danish private sector (Nielsen *et al.*, 2003), appear to have penetrated the minds of key employees and general managers in the public sector to a lesser extent, relative to, say, ABC and TQM. However, a general tendency seems to be a fairly high level of familiarity with each of the concepts.

<i>Concept & Score</i>	<i>Activity Based Costing</i>		<i>Balanced Scorecard</i>		<i>Intellectual Capital Statement</i>		<i>Business Excellence/Common Asset Framework</i>		<i>Total Quality Management</i>	
	Freq.	Percent	Freq.	Percent	Freq.	Percent	Freq.	Percent	Freq.	Percent
1	14	4,9	36	12,6	22	7,7	7	2,5	20	7,0
2	12	4,2	47	16,5	45	15,8	14	4,9	38	13,3
3	18	6,3	52	18,2	56	19,6	21	7,4	39	13,7
4	20	7,0	41	14,4	40	14,0	22	7,7	32	11,2
5	22	7,7	31	10,9	54	18,9	22	7,7	25	8,8
6	50	17,5	24	8,4	34	11,9	58	20,4	49	17,2
7	149	52,3	54	18,9	34	11,9	141	49,5	82	28,8
<i>Total</i>	285	100	285	100	285	100	285	100	285	100
<i>Avr. Score</i>	5,70		3,95		4,04		5,72		4,68	

Table 5: Degree of knowledge regarding five management accounting practices (Part 8a from questionnaire)

Having touched upon familiarity a relevant next step would be to ask respondents directly as to the particular entity's actual usage of the various models. As shown in Table 6, usage of each of the investigated models seems fairly limited in Danish public sector entities, with ABC, BSC, and IC lying somewhere in the 10% region and BE and

TQM only being used in 3.5 and 3.9% of the cases investigated, respectively. Thus, in spite of the seemingly increasing focus on modern MASs in public sectors (Ittner and Larcker, 1998), there still seems to a large potential for further usage of these models in the Danish public sector.

	<i>Activity Based Costing</i>		<i>Balanced Scorecard</i>		<i>Intellectual Capital Statement</i>		<i>Business Excellence/ Common Asset Framework</i>		<i>Total Quality Management</i>	
	Freq.	Percent	Freq.	Percent	Freq.	Percent	Freq.	Percent	Freq.	Percent
Yes	23	8,1	30	10,5	27	9,5	10	3,5	11	3,9
No	262	91,9	255	89,5	258	90,5	275	96,5	274	96,1
Total	285	100	285	100	285	100	285	100	285	100

Table 6: Usage regarding five management accounting practices (Part 8b from questionnaire)

It seems relevant to examine possible reasons for the fairly limited adoption of the models in question and the qualitative statements given by some respondents seem to suggest some possible explanations, namely resistance to change and some entities being in the early stages of implementation of these concepts:

“We do whatever we can to keep all these theoretical models from our doorstep, use our common sense and the dialogue with the employee as our most important management control tool.”

“Cost principle[s] are entering the municipalities and, thus, we are only in our modest beginnings...”

“The organization has only within the last year to year and a half begun to change its management accounting and leadership strategy from the 80’ies according to more modern models.”

Below a few more descriptive statistics are show concerning; the relation between strategy and freedom of decentralization (table 7); the the rate of cost allocation (table 8); the level of measures for the delived services to the citizens (table 9); and the utilization of benchmarking compared against similarly disposed organisations (table 10).

Concepts & Score	<i>The budgeting process is carefully determined without any degree of freedoms</i>		<i>There is a connection between the service goal and the controlling frame</i>		<i>Within the controlling frame we have degree of freedom to plan different areas</i>		<i>The used measures are normally connected to the superior goal of the organisation</i>		<i>The used measures are normally connected to our superior challenges</i>		<i>Non-financial measures are at least as important as our financial measures ...</i>	
	Freq.	Percent	Freq.	Percent	Freq.	Percent	Freq.	Percent	Freq.	Percent	Freq.	Percent
1	24	8,5%	12	4,3%	13	4,6%	21	8,1%	15	5,8%	10	3,6%
2	34	12,0%	25	8,9%	14	4,9%	18	6,9%	14	5,4%	12	4,3%
3	42	14,8%	33	11,7%	11	3,9%	29	11,2%	32	12,4%	15	5,4%
4	33	11,7%	43	15,3%	16	5,6%	44	16,9%	36	14,0%	25	9,1%
5	48	17,0%	66	23,5%	34	12,0%	43	16,5%	54	20,9%	48	17,4%
6	68	24,0%	69	24,6%	105	37,0%	74	28,5%	81	31,4%	78	28,3%
7	34	12,0%	33	11,7%	91	32,0%	31	11,9%	26	10,1%	88	31,9%
Total	283	100%		100%	284	100%	260	100%	258	100%	276	100%
Avr. Score	4,4		4,7		5,5		4,6		4,7		5,4	

Table 7: The relation between strategy and freedom of decentralization (Part 1 in questionnaire)

The purpose of these questions were to disclose the rate of freedom of magement that exist within the organisation and in relation to the superior strategy of the organisation. As it is shown, the level of freedom in the organisation seems to be about average for all. However, questions concerning *the freedom within the control frame to plan different areas* and within *Non-financial measures are at least as important as our financial measures in relation to the management of the organisation*, are above average with 5,5 and 5,4. This indicates an increased emphasise on letting the local government decide how to run and develop these areas.

Concept & Score	<i>We are able to allocate direct manpower and direct material to our services</i>		<i>We allocate all indirect costs across our services (e.g. administration)</i>		<i>We are able to price changes in our goal setting using our present control system</i>		<i>We are able to assign all variable costs to the organisation's services</i>		<i>We are able to estimate costs linked with each type of service/product</i>	
	Freq.	Percent	Freq.	Percent	Freq.	Percent	Freq.	Percent	Freq.	Percent
1	21	7,5%	44	15,7%	42	15,8%	36	13,0%	33	11,7%
2	29	10,3%	61	21,7%	47	17,7%	45	16,3%	42	14,9%
3	38	13,5%	34	12,1%	52	19,5%	46	16,7%	44	15,7%
4	32	11,4%	45	16,0%	38	14,3%	45	16,3%	34	12,1%
5	50	17,8%	42	14,9%	40	15,0%	52	18,8%	59	21,0%
6	60	21,4%	28	10,0%	30	11,3%	35	12,7%	38	13,5%
7	51	18,1%	27	9,6%	17	6,4%	17	6,2%	31	11,0%
Total	281	100%	281	100%	266	100%	276	100%	281	100%
Avr. Score	4,6		3,6		3,5		3,7		4	

Table 8: The rate of cost allocation (Part 2 in questionnaire)

This section concerns the level of cost allocations. Generally, both direct and indirect costs are allocated, whereas cost allocation for pricing is not spread as in the private sector. This privatization will probably increase in the future because demands on outsourcing and competition within the local areas.

<i>Concept & Score</i>	<i>We have measures that relate to the composition of the citizen/or users</i>		<i>We have measures from citizen/users that relate to the satisfaction concerning our services</i>		<i>We have measures that relate the citizens/users access to our organisation and our employees...</i>		<i>We have measures concerning the use of information technology in our daily work</i>		<i>We have measures concerning quality of our services</i>		<i>We have measures concerning outcome and effect for the citizens/users experience of our services</i>		<i>Service targets er central for our organisation</i>	
	Freq.	Percent	Freq.	Percent	Freq.	Percent	Freq.	Percent	Freq.	Percent	Freq.	Percent	Freq.	Percent
<i>1</i>	57	20,7%	61	21,6%	64	23,6%	66	23,8%	50	17,9%	70	24,9%	21	7,4%
<i>2</i>	37	13,5%	52	18,4%	56	20,7%	61	22,0%	48	17,1%	58	20,6%	21	7,4%
<i>3</i>	31	11,3%	44	15,5%	35	12,9%	39	14,1%	46	16,4%	42	14,9%	34	12,1%
<i>4</i>	32	11,6%	36	12,7%	33	12,2%	40	14,4%	37	13,2%	41	14,6%	45	16,0%
<i>5</i>	32	11,6%	40	14,1%	36	13,3%	35	12,6%	43	15,4%	27	9,6%	55	19,5%
<i>6</i>	51	18,5%	27	9,5%	34	12,5%	28	10,1%	43	15,4%	31	11,0%	74	26,2%
<i>7</i>	35	12,7%	23	8,1%	13	4,8%	8	2,9%	13	4,6%	12	4,3%	32	11,3%
<i>Total</i>	275	100%	283	100%	271	100%	277	100%	280	100%	281	100%	282	100%
<i>Avr. Score</i>	3,9		3,4		3,3		3,1		3,6		3,1		4,6	

Table 9: The level of measures for the delived services to the citizens (Part 4 in questionnaire)

This section concerns the type of measures and the level of measures for the citizens/user. Generally, the level seems appropriate, however, measures concerning *information technology* and measures concerning *the citizens experiencess* are a little lower. The last ourcome may also be difficult to measure because the customer or citizens are a very heterogeneous group and because the defintion of a service is very broad.

<i>Concept & Score</i>	<i>We benchmark all our costs and cost structures against similarly disposed organisations</i>		<i>We benchmark our results from our employee surveys against similarly exposed organisations</i>		<i>We benchmark all our results from our citizen surveys against similarly disposed organisations</i>		<i>We benchmark all our results from process estimates against similarly disposed organisations from the private sector</i>	
	Freq.	Percent	Freq.	Percent	Freq.	Percent	Freq.	Percent
<i>1</i>	62	21,8%	116	41,3%	110	39,1%	148	53,2%
<i>2</i>	40	14,1%	49	17,4%	55	19,6%	50	18,0%
<i>3</i>	41	14,4%	41	14,6%	45	16,0%	40	14,4%
<i>4</i>	25	8,8%	28	10,0%	25	8,9%	19	6,8%
<i>5</i>	48	16,9%	19	6,8%	22	7,8%	8	2,9%
<i>6</i>	44	15,5%	21	7,5%	17	6,0%	8	2,9%
<i>7</i>	24	8,5%	7	2,5%	7	2,5%	5	1,8%
<i>Total</i>	284	100%	281	100%	281	100%	278	100%
<i>Avr. Score</i>	<i>3,7</i>		<i>2,6</i>		<i>2,5</i>		<i>2</i>	

Table 10: The utilization of benchmarking compared against similarly disposed organisations (Part 6 in questionnaire)

This section concerns the level of benchmarking of financial and non-financial measures comparing to other a-like organisations. Both benchmarking concerning the employess's satisfaction, citizen's satisfaction and the benchmarking against the private section for process measures are below average, whereas the benchmarking of costs are about average. The last point may be due to the fact that costs are easier to measure.

5.1.3 Factor analysis for different statements or items

In order to see if specific items relate to different models, and to see if the organisation or respondent picks elements from a number of theoretical concepts from the literature as shown for the private sector (Cooper & Kaplan, 1991; Anderson 1995) we have conducted a factor analysis. In the manufacturing environment, companies also adopt a combination of advanced manufacturing techniques (Fullerton & McWatters, 2004).

For this reason, groups of related elements from new accounting practices, that the organisation actually prioritises to use, are searched for. Variables containing information about the level of priority given to the accounting practices have been classified using explorative factor analysis. *Extraction by Principal Component Analysis and varimax rotation with Kaiser Normalization* revealed four components with eigenvalues above one explaining 60 percent of the total variance factor loadings are summarised in table 11. These statements are based on a Likert scale from 1 to 7, where

7 constitute ‘very much agree’. The screen plot in figure 2, however, helps to determine the optimal number of loading factors. The eigenvalues of each component in the initial solution is plotted. Generally, you want to extract the components on the steep slope. The components on the shallow slope contribute little to the solution.

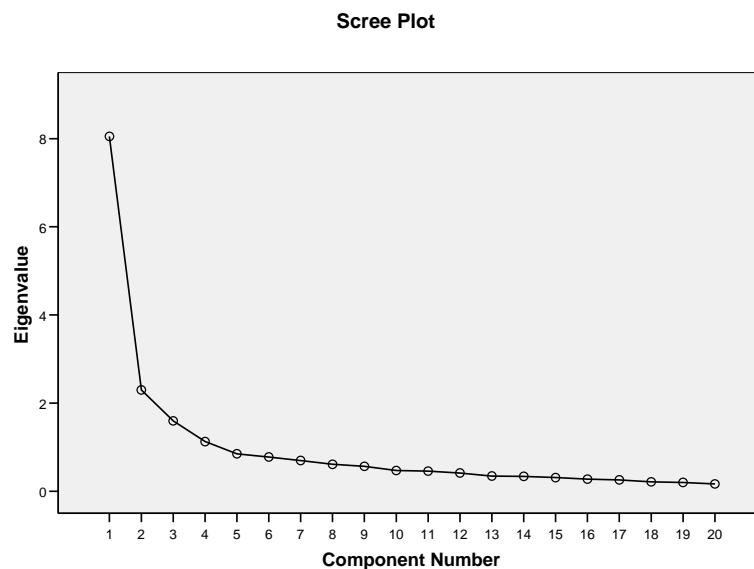


Figure 2: Relation between eigenvalues and the number of loading factors

Generally, factor analysis attempts to identify underlying variables that explain the pattern of correlations within a set of observed variables. This procedure is often used to reduce the number of variables in a data set but can also be used to explore the latent structure of the variables in a data file. The rotated Component Matrix contains factor loadings obtained from factor analysis of different statement on the subject, specificity related to part and statements based on new accounting practices.

<i>Statements/Question concerning</i>	<i>Factor 1</i>	<i>Factor 2</i>	<i>Factor 3</i>	<i>Main Concept</i>
Identification of resource pools	-0,006	0,469	0,554	ABC
The use of activity-based cost drivers	0,234	0,13	0,841	ABC
Awareness cost driver, time, number etc.	0,215	0,126	0,85	ABC
Using hierarchy of different cost objects	0,483	-0,005	0,698	ABC
Preparation of story telling based on knowledge	0,526	0,087	0,449	ITC
Explicitly defined management challenges	0,125	0,587	0,416	ITC
Strategy important for measures	0,662	0,239	0,411	ITC
Knowledge and competences stored	0,659	0,154	0,281	ITC
The use of competence profiles	0,542	0,352	0,221	ITC
The use of competences for employees	0,409	0,491	0,218	ITC
The use of resources in to strategy	0,076	0,737	0,164	BSC
To be innovative correspond to the strategy	0,147	0,726	-0,034	BSC
All measures are related to strategy	0,746	-0,082	0,134	BSC
Measures are close related to success factors	0,751	0,185	0,277	BSC
We use exact targets for all measures	0,632	0,4	0,18	BSC
Measures are clearly communicated out	0,443	0,52	0,132	BSC
We use quality from a holistic view	0,199	0,795	0,118	BSC
Process and change management are important	0,149	0,808	0,035	BSC
We measure our influence on society	0,753	0,136	0,01	BSC
We measure leadership from the organisation	0,675	0,365	0,033	BSC
Variations explained by the factors	40,3	11,5	8,0	-

Note:

High loadings are marked bold, indicating a membership to the concept.

Variance explained: 60 %

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

Table 11: Factor analysis based on three factors (Part 7 in questionnaire)

There are several interesting conclusion that can be drawn on the factor analysis. First, it seems that ABC hit the bull eye's which indicate a good understanding of what ABC stands for. On the contrary, the picture is muddier for ITC and BSC, probably because the differences between these models are unclear (any way in the real world!) and/or because they are used interactively or used as combinations.

In general, there are a lot of items that may have correlations greater than 0.2 with multiple factors, which muddies the picture. The rotated factor matrix should clear this up. Thus, there are three major groupings of items from different concepts, as defined by the different models that are most highly correlated with the three factors. Given these groupings, you can make the following observations about some of the statements:

1) Because of their moderately large correlations with both first and second factor, *identification of resource pool*, and *Explicitly defined management challenges* is

moderately correlated with the second and third factors, thus it bridges the "ABC" and "ITC" groups.

2) *Preparation of knowledge story telling* bridge the "ABC" and "BSC" groups.

3) Whereas there seems to several statements that bridge statements from both ITC and BSC, e.g. *measures are clearly communicated out*, or *strategy important for measures*.

This suggests avenues for cross-selection of more than a single model. For example, organisations how has interest in e.g. ITC may also have great use of BSC.

The factor transformation matrix describes the specific rotation applied to your factor solution. This matrix is used to compute the rotated factor matrix from the original (unrotated) factor matrix. It is important that statements from the new accounting practices relate with high levels of factor loadings to the same component indicating that somehow they belong to a common latent variable. However, in order for these latent variables to be valid, it should be possible to give plausible explanations to the real existence of the components found; otherwise the result is simply based on coincidence.

5.1.4 Two-way analysis of variance

To test the hypothesis about the equality of the mean of each cluster of items when we classify these into groups based on two factors we use a two-way analysis of variance (also called GLM univariate analysis of variance). Analysis of variance (ANOVA) is termed a univariate statistical procedure and can be used when we want to asses group differences on a single metric depending variable (vs. MANOVA may be used when we simultaneously want to explore the relationship between several categorical independent variables and two or more metric dependent variables), Hair *et al.*, (1998). In this study a general test between a single depending variable namely the size of the organization (defined here as the number of employees and the yearly budget) and different items (or cluster of items) in the questionnaire is conducted. Because some items are going in opposite directions, these have been re-coded to give a single value for that cluster. Only a single correlation has been found significant between the depending variable 'size' and measures of satisfaction, qualifications, and competences of the employees. The result is shown below in table 12.

<i>Source</i>	<i>Type III sum of squares</i>	<i>Df</i>	<i>Mean Square</i>	<i>F</i>	<i>Sig.</i>
Corrected model	7210,8 ^{a)}	41	175,8	2,1	0,000
Intercept	59741,8	1	59741,8	712,8	0,000
1)Yearly Budget	437,7	7	62,5	0,75	0,633
2)Number of employees	1690,8	7	241,5	2,9	0,007
1)*2)	2975,5	27	110,2	1,3	0,146
Error	18187,9	217	83,8		
Total	182017,0	259			
Corrected Total	25398,6	258			

^{a)} R Squared = 0,284 (Adjusted R Squared = 0,149)

Table 12: Variance analysis between size and employees

The column labelled ‘Source’ lists the effects in the model. The second column displays the sum of squares for each effect. Column three shows degree of freedom for each sum of squares. The ‘mean square’ of each effect is calculated by dividing the sum of squares by its degrees of freedom. The *F-statistic* and its significance value are displayed in the next columns. The *F-statistic* is calculated by dividing the mean square by the mean square error. Effects with a small significance value (*smaller than 0.05*) are significant. In this example only number of employees, are significant. Since the interactive effect 1)*2) is not significant, there may no differences in yearly budget and number of employees for these two as a combinations. Ignore the row labelled intercept and look instead at the row labelled corrected model, the corresponding sum of squares tells you’re the amount of variability in the dependent variable that n can be explained or attributed to all the effects we have specified. The *R Squared* shows that 28.4% can be explained of the total variability leaving the rest unexplained. This measure is neither worse nor better than these kinds of studies.

A further analysis (not shown here) also shows that for organisations with budgets below 50 millions Dkr., there is a lower tendency to measure the satisfaction, qualifications etc. of the citizens/user than would be in organizations with budget grant above 250 millions Dkr.

5.1.5 Correlations between main area key variables

In order to analyze structures between the main areas, the correlation matrix in table 13 has been constructed. A few of these correlations seem different from what might be

expected. Thus, one would expect a significant positive correlation the importance of non-financial measures relative to financial measures and degree of importance of project management in the entity since non-financial measures are an integral part of project management. However, such a correlation did not show up in the data and one possible explanation might be the fact that **(a)** in table 13 entails the weighing of financial and non-financial measures against one another. In project management **(d)** both financial and non-financial measures would typically be of some importance at the same time, hence the lacking significance of the correlation. As for the correlation between the extent to which the entity is able to compute the costs of each product or service **(b)** and the degree to which service measures are central indicators to the entity **(c)**, quite surprisingly, a significant positive correlation was found, contrary to what might be expected. There does not seem to be any immediate reason for this correlation between widely different elements of management accounting. However, the earlier mentioned possible tendency towards increasing attention to new accounting practices in general might provide one possible explanation. The remaining correlations in table 13 correspond with what could be expected, as one would expect the degree of importance of project management to be positively correlated to importance or extent of use of other modern management accounting techniques, due to the generally wide span of project management activities. Furthermore, as service measures **(c)** partly cover the same ground as non-financial measures **(a)**, the relevant significantly positive correlation would be expected ex ante.

			(a)	(b)	(c)	(d)
(a)	The importance of non-financial measures relative to financial measures	Pearson Correlation	1			
		<i>Sig. (2-tailed)</i>				
(b)	Extent to which the entity is able to compute the costs of each product or service	Pearson Correlation	0,06	1		
		<i>Sig. (2-tailed)</i>	0,32			
(c)	Service targets are central benchmarks for our organisation	Pearson Correlation	0,28*	0,28*	1	
		<i>Sig. (2-tailed)</i>	0,00	0,00		
(d)	Project management is an important area in our organisation	Pearson Correlation	0,06	0,31*	0,41*	1
		<i>Sig. (2-tailed)</i>	0,29	0,00	0,00	
* Correlation is significant at the 0.01 level (2-tailed).						

Table 13: Correlations between main area key variables

The correlations between the four different research areas seem to give an accumulated picture of the coherence of the survey and the integrated structure. This measure also indicates some coherence of the whole analysis.

6 Conclusions and future research

Up till to day only a few studies concerning the implementation of new accounting techniques in the public sector have been made worldwide (Bjørnenak, 2000; Jackson & Lapsley, 2004; Lapsley & Wright, 2004). Our results may be seen in several directions. Firstly, we have extended the diffusion and implementation of NPA with other analysis such as; test of size influence on financial and non-financial measures, degree of cost allocation, measure of customer services. It is clear that the NPM demands several of the earlier private relation control techniques and performance measures. It is also fair to say that specifically ABC and BE seems to be preferred, but also intellectual capital statements, TQM and BSC are concepts that have a great appeal in the government management area. But because of new reforms and a large political pressure financial and control managers in the public sector probably haven't been aware of the benefit and the complicated work associated with the implementation and adoption of new accounting practices. The degree of knowledge for accounting innovations is high, whereas utilization seems fairly limited. This indicates a large potential for further usage of these innovations. Secondly, looking at the relation between strategy and freedom of decentralization, the potentials for using ABC, BE etc. seems relatively good. Looking further to measures concerning the delivered services to the citizens, these results also signal that the need for new models or management tools. However, the utilization of benchmarking and comparison to other a-like organisations seems to fail, especially within process targets. Thirdly, we have tried to expose different statements from new accounting practices by the use of factor analysis. This analysis clearly shows that the employees have a good feeling for what constitutes ABC, BSC etc. It also shows that it may be difficult to separate BSC for ITC. Fourth, the 'size' (measured as the number of employees and the yearly budget) seems to influence measures of satisfaction, qualifications and competence of the employees. Finally, we found a significant relation between the importance of non-financial measures (relatively to financial) and the importance of service targets for the organisation.

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