

The adoption of Accrual Accounting in Greek Public Hospitals: Assessing the benefits

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INTRODUCTION

The reforms in the Public Sector and the New Public Management (NPM) have attracted considerable interest during the last years. The claimed benefits of NPM have been the following: better measurement of costs and revenues, greater focus on outputs, more efficient and effective use of resources, improved accountability, better financial management and greater comparability of managerial performance (Mellett, 2002; Olson et al., 2001).

According to Christiaens et al. (2004, 2007) the governmental accounting reform has often been the first step of government reform and that is why it can be considered as an important condition and prerequisite for the success of other consequent governmental reforms under the transformation wave of NPM, such as organizational and managerial reforms. Therefore, effective and successful implementation of the accounting reform plays an important and dominant role in the implementation and success of other NPM practices and techniques within public organizations. Without an adequate and successful implementation, all the anticipated gains, the presupposed objectives and expectations of the reform will be lost due to the fact that the new accounting system will not be able to provide relevant and accurate managerial and financial information to support it. (Christiaens and VanPeteghem, 2007).

This change of public accounting systems towards accrual accounting seems necessary as the traditional budgetary cash accounting system is perceived nowadays as no longer satisfactory, mainly due to the lack of presenting an accurate financial picture and providing useful and adequate accounting information to facilitate the planning and performance process (Cohen, 2007; Lapsley, 1999).

Within the context of NPM and following the example of numerous other countries in Europe and worldwide, the Greek public sector has encountered a number of financial accounting changes and reforms over the last ten years in order to meet the challenges that increased globalization has brought , more recently to face economic crisis. As a result, in 1997 the Greek government started introducing the accrual based accounting system and double-entry bookkeeping method to some specific sectors of government activities in order to modernize its governmental accounting system. The most important examples of the Greek public sector entities, where an accounting reform took place towards accrual accounting are: Social Securities funds (1997), Public law entities (1998), local government institutions; Municipalities, (1999) and finally public owned hospitals (2003).

In particular, in the international public sector accounting literature, the accrual accounting initiative is claimed to have a number of benefits, which can be grouped and summarised as follows : (i) identification of total cost of government programs and activities; better measurement of costs and revenues; enhancement of control process and transparency (ii) greater focus on outputs; focus on the long-term impact of decisions (iii) more efficient and effective use and management of resources and greater accountability (iv) reduction and better measurement of public expenditures (v) better presentation of the financial position of the public sector organisations (vi) better financial management; improvement of performance measurements and greater comparability of managerial performance between periods and organizations by calculating indicators on the basis of comprehensive and consistent financial and operational data (vii) greater attention to assets and more complete information on public organisations' liabilities through better assets and liabilities management. (Mellett, 2002; Barrett,1993; Evans, 1995; Pallot, 2001; Mellor, 1996; Brusca, 1997; Funnell and Cooper, 1998; Ryan, 1998; Chan, 2003; Guthrie, 1998; Jones, 2005; Venieris and Cohen, 2004; Cohen et al., 2007; Pessina and Steccolini, 2007; OECD, 2005; and International Federation of Accountants - Public Sector Committee, 2000 and 2002, pp. 7–10).

However, a considerable body of researchers call attention upon the adoption of the accruals accounting system by public organisations and believe that its implementation is often accompanied by a plethora of drawbacks and problems which eventually overcome its anticipated benefits; For them, the transition from the cash to accrual accounting system will only succeed in the coming years in business-like parts of government activities, such as Health Care organizations (Christiaens and Rommel, 2008). These problems may arise due to vague accounting objectives, standards and treatments that usually derive from unclear aspects of accounting legislation, such as assets identification and valuation, assets register -measurement of depreciation of physical assets and amortization of intangible assets- recognition of income and expenses, identification of opening balances. (Christiaens, 2001; and Hepworth, 2003; Christiaens and Rommel, 2008; Jones 2005; Cohen et al., 2007; Ouda, 2008).

Except of overcoming and tackling these specific accounting issues, a second group of problems during the transition process is related to organizational and process factors. (Cohen, 2007). Examples of these factors may include the (in)adequacy of information technology capability, the lack of qualified personnel resources to implement accrual accounting, the lack of accounting training resources, the absence of motivation and incentives for accrual accounting adoption and the insufficient political and Top Management Support and commitment, (Cohen et al., 2007; Pallot, 2001; Jones and Pendlebury, 1991; Guthrie, 1998; Newberry, 2002; Carlin and Guthrie, 2003; Hodges and Mellett, 2003; and Brusca, 1997) .

In order to reap the full benefits of switching to accruals accounting it is important to take into account the above frequently cited problems and shortcomings of public accounting reform in order to control and resolve them. Otherwise, the adoption and implementation of the accrual based accounting system may be delayed or impeded.

The purpose of this paper is first to present evidence regarding the implementation of accrual-based accounting system (ABAS) in Greek National Health System, and second to examine associations between perceived benefits of ABAS and contingent factors in Greek National Health System (GNHS) using a sample of 54 public hospitals in Greece.

This objective derives from the fact that limited empirical evidence has been presented until today about the views and attitudes of practicing accountants and finance officers regarding this initiative in public sector literature worldwide and especially in Greece.

The remainder of the paper proceeds as follows. The next section presents a short description of the Greek National Health System (GNHS) and the financial accounting reforms that took place during the last ten years. The third section describes the methodology applied in this study. The presentation of the research results is found in section four. The paper conclusions drawn from the research are set out in the final section.

ACCOUNTING REFORM IN THE GREEK PUBLIC HEALTH SECTOR

Greek public hospitals have experienced a plethora of organizational, administrative and financial reforms since the mid-1980s in the name of improved efficiency, effectiveness, and accountability.

The GNHS can be characterised as a “dual-mixed” system, in which elements from both the Bismarck (increased importance of social insurance in funding health care) and the Beveridge (health care primary funded by state budget) model co-exist.

Health care services, in the public sector, (mainly secondary and tertiary health care) are provided in 132 general and specialized public hospitals operate within the NHS.

Traditionally, Greek governmental budgeting and accounting system at all three levels of public governance -central, regional and local- is regulated by law and not by an independent standard-setting professional body and is still being based upon the cash principle of accounting.

Similarly, the governmental accounting regulations applying to Greek public hospitals - which date back to 1974 with the legislative decree 496/74 - were also based on a old budgetary and single-entry book-keeping accounting system and had a primarily cash basis accounting approach.

More specifically, the main purpose and concern of the public hospitals’ budgetary cash accounting system was to recognize transactions and other events only when cash was received or paid, to record them in the authorised budgets, driven by budgetary principles, and finally to control the execution of the budget approved by the governmental decision makers. On the other hand, little attention was given to providing a complete picture of the financial position and financial performance of public hospitals.

The Greek management literature has long pointed out the need for reforming this budgetary cash accounting system in the health public sector and has indeed supported the

switch to accruals accounting (Ballas and Tsoukas, 2000; Venieris and Cohen, 2003). Traditional budgetary cash accounting has long been viewed as ‘outdated’, no longer satisfactory and making a significant contribution to the inefficiency and ineffectiveness of the Greek public sector because it does not permit the disclosure of the full picture of the economic activity and financial position of the public hospitals (Lüder and Jones; 2003).

The initial efforts of introducing the accrual basis of accounting in public hospitals in Greece commenced in 1997 under the Law 2519/97. This Law presented for the first time the government’s attempt and intention to introduce a double-entry bookkeeping accounting system and cost management methodologies in public hospitals based on the accrual basis.

For this purpose, the development and preparation of an Official Health Sector Accounting Plan (HSAP), aimed at developing the conceptual framework for accrual accounting in public hospitals, was assigned by the Ministry of Economy and Finance to the national Council of Accounting (ESYL) and to the Chamber of Finance (OEE).

The HSAP mainly included broad guidelines regarding principles for accrual basis accounting implementation, similar to those applied to the private sector, the charts of accounts, asset classification, examples of journal entries, templates of the layout and the content of the published financial statements (i.e. balance sheet, income statement, cash flow statement, The Statement of Income Distribution, Budget report and Actual report) and some suggested financial ratios (Venieris and Cohen, 2004).

Furthermore, a pilot implementation project, under the experimentation clauses of the HSAP, commenced in 1999 in order to test the suitability of the new accounting system and its readiness for full implementation. Five Public owned hospitals that would implement the HSAP as pioneers were selected.

The governmental efforts to reform the accounting system of the health sector escalated in 2003, after taking the pilot implementation experiences into account and making the necessary modification and amendments to the HSAP, when a law, the Presidential Decree 146/03 (P.D. 146/03), was passed.

The P.D. 146/03 enforced the mandatory adoption of the new accounting system, based on accrual accounting, to all public hospitals that are part of the Greek NHS and established the necessary guidelines and accounting standards for financial reporting. However, the previous traditional budgetary cash accounting system was not totally abandoned but instead, the public hospitals just added the accrual accounting system separately and most of the budgetary accounting principles were maintained (Christiaens, 2001). The new accounting framework of the P.D. 146/03 defined two accounting systems that should work in parallel under three independent accounting cycles; the financial accounting cycle, the budgeting cycle and the cost accounting cycle, within the same general ledger and while each one would still retain its autonomy. The legislator believed that the solution of introducing this combined approach for accrual accounting and double-entry budgetary cash accounting through two separate accounting systems should be the most beneficial in order to reap the best of the two accounting systems, as each one has its own strengths and

weaknesses (Venieris and Cohen, 2004). The financial accounting system aims at reporting the financial position and the yearly profit and loss of hospitals, the budgeting system aims at authorizing and controlling the public spending (Christiaens and Rommel, 2008) and the cost accounting system aims at calculating the health services' full cost by using the accounting data of the financial accounting cycle (accrual accounting) and processing them within a rather complicated framework of double entry journal entries (Venieris and Cohen, 2004).

The P.D. 146/03 pointed out that the deadline for the implementation of accrual financial accounting in public hospitals was the 1st of January 2004, while the deadline for cost accounting introduction was the 1st of January 2005.

RESEARCH OBJECTIVES

In order that the new accounting system could be effectively used in the public owned hospitals, a better understanding of the derived accounting benefits and problems need to be investigated and developed. Therefore the following three (3) research questions will be studied:

RQ1 : To what extent have Greek public health care organizations implemented the new accounting regime set out in the PD 146/03 ?

RQ2 : What are the accounting benefits and implementation problems regarding the implementation and adoption of accrual accounting reform?

RQ3: Is there a relation between accrual accounting benefits, and implementation problems, implementation cost, education level of accounting department personnel, learning experience effect and hospital size?

METHODOLOGY

The principal area of investigation is to present the status quo of accounting reform adoption in Greek Public hospitals as well as the implementation problems and the perceived usefulness of the financial information provided by accrual accounting system for decision-making purposes. To determine all the above a survey using questionnaires was conducted during 2008 in all Greek public hospitals in order to gather the necessary data. The questionnaire was sent by e-mail and Fax to 132 Financial Managers working within the public hospitals accounting and finance departments, on the understanding that they are users who know in depth how the new accounting system is used and operated in their organizations. Eventually, out of 132 distributed questionnaires, 54 were returned. As a result the response rate was 41% covering all the regions of the country (see table 1).

Most of the questions included in the questionnaire form are multiple choice, either yes/no answers or answers on a five-point Likert scale ranging of 1 to 5, where 1 indicating full disagreement and 5 indicating full agreement (or in some cases 1 corresponds to the lowest

degree and five to the highest). SPSS version 17 was used, In order to analyze the data collected via the survey questionnaire, as the most common statistical package. Also, it is important to note that the sample representativeness was tested and the result of the statistical test, chi-square, goodness-of-fit, shown that the sample's distribution is not significantly different from the total population of 132 Greek public hospitals. (chi-square: 2.0 ; p = 0.09)

Table 1. Coverage Ratio of answered questionnaires per Health Region

<i>Health Regions</i>	<i>Total Number of Hospitals</i>	<i>No of Hospitals answered the questionnaire</i>	<i>% of Hospitals answered the questionnaire</i>
1 st Attiki	27	11	40,7%
2 nd Peiraia- Aigaio	20	8	40%
3 rd Makedonia	17	10	59%
4 th Anat. Makedonia & Thraki	15	5	33%
5 th Thessalia - Sterea Ellada	13	4	31%
6 th Peloponnisos - Ionia Nisia - Dytiki	31	13	42%
7 th Kriti	9	3	42%
Total number	132	54	41%

SURVEY RESULTS

Implementation rate of ABAS

The survey revealed that even though the financial accrual accounting system has been adopted and used by 45 out of 54 (83.3%) public hospitals, which is a quite satisfactory rate, on the other hand, the introduction of management accounting practices has not yet seriously progressed, as only 10 out of 54 (18.5%) hospitals had developed and implemented an operating cost accrual accounting system. According to our survey data, another 32 (60%) hospitals are in the process of developing and implementing a cost accounting system that will be completed by the year 2010. Despite the fact that the deadline imposed by the Presidential Decree 146/03, concerning cost accrual accounting system implementation, was formally the 1st January, 2005, the remaining 12 (23%) hospitals answered that the introduction of such an accounting system was not for them an option even in their future plans (Table 2).

Table 2. Implementation Rate of ABAS

		YES	NO	Total
Financial	accruals	45	9	54
accounting system		(83.3%)	(16.7%)	(100%)
Cost accounting system		10	44	54
(N = 54)		(18.5%)	(81.5%)	(100%)

Perceived benefits of the ABAS adoption

In Table 3, we present the responses of Financial Managers regarding the perceived usefulness and importance of the new accounting system in producing and presenting adequate accounting information for decision-making purposes.

Table 3. Results of Financial Managers perception regarding the benefits of ABAS adoption

Benefits <i>(coefficient alfa = 0.933)</i>	Percentage of Hospitals					Mean	St deviation	Ranking
	1*	2	3	4	5			
Better management of assets and liabilities	0,0%	0.0%	8.9%	55.6%	35.6%	4.27	0.618	1
Improves financial disclosure and measurement of the true and accurate financial position	0.0%	2.2%	11.1%	44.4%	42.2%	4.25	0.751	2
Improves the consistency and comparability of financial information reported	4.4%	2.2%	15.6%	42.2%	35.6%	4.02	1.011	3
Improves Decisions based on accurate, timely, and reliable accounting information	2.2%	13.9%	6.7%	37.8%	40.0%	3.98	1.108	4
Better management of cash position and financing requirements	2.2%	11.1%	20.0%	40.0%	26.7%	3.87	1.079	5
Improves financial transparency and accountability	2.2%	13.3%	26.7%	24.5%	28.9%	3.62	1.173	6

Improves resource use and allocation	6.7%	17.8%	26.7%	24.4%	24.4%	3.42	1.234	7
Better measurement of financial performance	13.3%	11.1%	22.2%	31.1%	22.2%	3.38	1.319	8
Better calculation of actual total product cost	20.0%	8.9%	15.6%	31.1%	24.4%	3.31	1.459	9
Identification of the factors responsible for cost creation	13.3%	22.2%	28.9%	28.9%	6,7%	2.93	1.156	10

**Note: scale 1= strongly Disagree to 5 = strongly Agree*

Respondents have quoted a number of benefits regarding the accrual accounting system adoption. As indicated in Table 3, the most important benefits from implementing accrual accounting are the “Improved Monitoring of assets and liabilities” (Mean 4.27), “Improved disclosure of the true and accurate financial position” (Mean 4.25), and the “Improved consistency and comparability of financial information reported” (Mean 4.02).

On the contrary, the merits that do not seem to have influenced the respondents to a great extent and received the lowest rating are the “Better measurement of financial performance” (Mean 3.38), the “Better calculation of actual total product cost ” and control of service cost” (Mean 3.31) and finally, the “Identification of the factors responsible for cost creation and cost reduction” (Mean 2.93). It seems, from the Financial Managers responses, that the accrual accounting adoption in the public hospitals has a limited impact in management accounting perceived benefits. These low scores of perceived benefits are consistent with institutional theories that the implementation of mandated organizational changes in government organizations tends to be symbolic, with little effect on internal operations (Cavalluzzo and Ittner, 2004; Ballas and Tsoukas, 2004).

Problems faced in relation to ABAS implementation and adoption process

These results in Table 4 confirmed the main findings reported in existing literature by revealing that the most highly-rated technical and organizational factors hindering the adoption of accrual basis financial and cost accounting appeared to be the “Adequacy of resources” (Mean 2.29), the “Data limitations and collection” (Mean 2.24), and the “lack of knowledge and expertise to implement such a system” (Mean 2.22). The areas that were indicated by the public hospitals sample as the ones being less problematic are the “Insufficient Top Management commitment” (Mean 1.82) and the “Selection of the appropriate accounting software” (Mean 1.67).

Table 4. Results of respondents' perception regarding problems faced in relation to ABAS implementation

Problems <i>(coefficient alfa = 0.879)</i>	Percentage of Hospitals					
	1*	2	3	Mean	St. deviation	Ranking
Lack of adequate resources (accounting staff and IT Systems)	15.6%	40.0%	44.4%	2.29	0.733	1
Data limitations and collection	13.3%	48.9%	37.8%	2.24	0.679	2
lack of knowledge and expertise to implement such a system	20.0%	37.8%	42.2%	2.22	0.765	3
Personnel's reluctance to implement such a system	13.3%	53.3%	33.3%	2.20	0.661	4
lack of specific training	17.8%	48.9%	33.3%	2.16	0.706	5
Lack of clear accounting standards	22.2%	46.7%	31.1%	2.09	0.733	6
Lack of staff motivation and incentives	20.0%	73.3%	6.7%	1.87	0.505	7
Insufficient Top Management commitment	35.6%	46.7%	17.8%	1.82	0.716	8
Availability of appropriate accrual accounting software	42.2%	48.9%	8.9%	1.67	0.640	9

**Note: measured on scale 1= no problems encountered to 3 = significant problems encountered*

The above mentioned factors, hindering the implementation process of the accrual accounting system in the Greek public health sector, are also found in the public sectors of other developed countries (Christiaens, 2001; Hepworth, 2003, Brusca, 1997, Pendlebury and Karbhari, 1998; Jones and Puglisi, 1997, Guthrie, 1998; and Pallot, 2001, Montesinos and Vela, 2000; Monsen, 2002, Newberry, 2002, Goldman and Brashares, 1991; Hodges and Mellet, 2003, Hoque and Moll, 2001, Cohen et al., 2007).

The costs of implementing accrual accounting

The high cost of implementing an accounting system is considered to be a top concern to many researchers regarding the successful implementation of a new accounting system (Lawson, 2005; Udpa, 1996; Canby, 1995).

In order to measure the cost of implementing and adopting an accrual based accounting system (i.e., training costs, adjust existing or install new Information systems, consultants' fees) a single-item scale was used. Respondents were asked to rate the implementation cost of the accruals in their organization in comparison to the anticipated accounting benefits derived from the reform on a five-point likert scale that ranged from 1 = very low and 5 = very high. As displayed in table 5, the majority of the respondents (75.6 %) believe that the perceived benefits from the adoption of accruals exceed the respective costs.

Table 5. Results of respondents' perception regarding the cost of implementing ABAS

	Percentage of Hospitals					Mean	St. deviation
	1*	2	3	4	5		
The cost of accrual basis accounting system adoption	33.3%	31.1%	11.1%	22.2%	2.2%	2.29	1.218
(N=45)	(15)	(14)	(5)	(10)	(1)		

**Note: measured on scale 1 = very low to 5 = Very high.*

Long-term experience in accrual accounting concept

Hospitals with long term experience in accrual accounting are assumed to have gathered all the relevant necessary experience and to be familiar with the accrual concept by now. These hospitals are expected to have resolved most of the accounting and implementation problems and shortcomings emerged during the accrual accounting system installation and to have progressively overcome most of these difficulties as they are getting familiarized with it. Thus, hospitals with long-term experience in accrual accounting are assumed to exhibit a higher level of perceived benefits from the new accounting regime. As shown in table 8, most of the hospitals (57.8 percent) are in the early stages of running accrual accounting (one or two years that have issued financial statements on an accrual basis). The number of years since first financial statements published is included in our study as a variable in order to capture at least some of the variation due to timing issues and to test the influence of learning experience effect on accounting benefits (Christiaens, 2001; Cohen et al., 2007).

Table 6. Years since accruals accounting adoption

Number of Hospitals			
Years	Frequency	%	Mean (St deviation)
1	7	15.6	3.20
2	19	42.2	(2.222)
3	5	11.1	
4	4	8.9	
5	3	6.7	
6	2	4.4	
7	1	2.2	
8	2	4.4	
9	2	4.4	
Total	45	100	

General Education level of accounting Department and organization size

The last two factors, the education level (staff; executives) as an indicator of general professionalism of accounting staff and the hospital size, have been described as implementation barriers at Lüders's (1990) contingency model, affecting the successful implementation of accounting systems. These factors are included in our study in order to quantify its impact and effect on the perceived benefits of accrual accounting adoption.

Table 7. Accounting Dept. personnel's education level

	Secondary Education	Undergraduate studies	Postgraduates studies	Total
Education Type	57.8%	39.2%	2.2 %	100 %
Education Level	Low	Medium	High	

As displayed in Table 7, the education variable has been categorized into two stages, the secondary education comprising high schools, secondary schools or gymnasiums and the post-secondary education or higher education, also referred as tertiary education stage, which includes undergraduates and postgraduate studies providing by colleges, universities and institutes of technology.

According to our data, most of accounting employees (57.8 percent) within hospitals graduated in the secondary education level and only a 2.2 percent has acquired a postgraduate Degree, such as Master's or Ph.D.

Finally, the variable size is included in our study in order to examine its impact on accrual accounting adoption's perceived benefits. The indicator size has been incorporated in prior governmental accounting studies but without exhibiting a clear impact on accrual accounting implementation. Some researchers believe that larger public organizations are positively associated with the level of success (Christiaens, 1999 and 2001), however, there are studies which found no significant relationship (Evans and Patton, 1983; Robbins and Austin, 1986) and even studies with an observed negative relationship (Luder, 1990; Cohen and Kaimenakis, 2007). In our study, the natural logarithm of hospital beds is used as a proxy for the size of hospitals and not the total revenues or assets due to the different nature of public organizations goals and objectives compared with these of private sector (see table 8).

Table 8. Hospitals number of beds

Number of Hospitals			
No of beds	Frequency	%	Mean (St deviation)
Up to 100	12	26.7	348.4
100 – 350	17	37.8	(291.82)
350 -500	4	8.9	
Over 500	12	26.7	
Total	54	100	

In order to answer the last research question regarding the relation between actual accounting benefits, problems, accrual implementation cost, learning experience effect, CEOs educational background, education level of accounting staff and hospital size, a correlation matrix and a multivariate regression were used to examine if statistical significant correlations and associations exist between the above mentioned variables on the perceived benefits from accrual accounting adoption (see table 9).

From the analysis of the bivariate correlation it is evident that accounting benefits, implementation problems, implementation cost, size and education level are significantly highly correlated with benefits variable. More specifically, the correlation among accounting benefits and hospital size and education level of accounting employees exhibits a positive statistically significant Pearson correlation coefficient with $r= 0.331$ ($p < 0.05$) and $r= 0.394$ ($p < 0.01$) respectively.

The correlations among accounting benefits and implementation problems and the cost of accrual accounting system implementation reveal a negative and statistically significant

Pearson correlations coefficients of $r = -0.520$ ($p < 0.01$) and $r = -0.614$ ($p < 0.01$) respectively.

These findings further confirm the strong relation among the above-mentioned variables in the context. However, the variable regarding hospitals' accrual accounting learning experience, shows a negative path coefficient, but without exhibiting any statistically significant correlation, with the satisfaction. The same conclusions can be drawn from the analysis of Spearman correlation coefficients.

Table 9. Pearson and spearman correlation matrix for all the variables.

Variable (N = 45)	Benefits	Problems	Size	Cost	Years	Educ_level
Adoption Benefits	1.000	-0.510**	0.341*	-0.502**	-0.175	0.365*
Implementation Problems	-0.520**	1.000	-0.285*	0.570**	0.151	-0.098
Hospital Size	0.331*	-0.235*	1.000	-0.130	0.207	0.296
Implementation Cost	-0.614**	0.567**	-0.119	1.000	0.173	-0.232
Experience effect	-0.070	0.018	0.282	0.121	1.000	0.112
Level of education (%)	0.394**	-0.077	0.275	-0.245	0.171	1.000

Notes : The correlations above the diagonal correspond to Spearman two-tailed correlations. The correlations below the diagonal correspond to Pearson two-tailed correlations.

** Significance at 1% level (two-tailed); * Significance at 5% level (2-tailed)

The univariate tests provide valuable information regarding a large number of variables over a sample. But, although, the univariate results are informative there is a question of whether the association is a direct association or whether there is a joint correlation with a third or fourth variable. Thus, this study uses a multivariate regression analysis to examine the effect of the five factors that were presented in the previous section on the accounting benefits from the coercively imposed ABAS in public hospitals.

The results of the Ordinary Least Squares (OLS) regression are presented in the table below (Table 10).

Table 10. Coefficient estimates of ABAS perceived benefits

Independent variables	Hypothesized Sign	BENEFITS	Collinearity statistics	
			Tolerance	VIF
Implementation problems	-	-0.241 (-1.745*)	0.636	1.573
Hospital size	+	0.192 (1.570)	0.812	1.231
Implementation cost	-	-0.379 (-2.696**)	0.611	1.636
Learning experience effect	+	-0.120 (-1.025)	0.877	1.140
Level of education (Staff; executives)	+	0.247 (2.054**)	0.837	1.195
Adjusted R ²	0.467			
F-statistic	8.710***			
Durbin-Watson	1.643			

Notes: Ordinary least squares coefficients, with corresponding t-statistics in parentheses. Intercept terms are not reported. *BENEFITS* = the average number of perceived accounting benefits derived from the accounting reform (10 likert items); *IMPLEMENTATION PROBLEMS* = the average number of perceived obstacles faced in relation to the accounting reform (9 likert items); *HOSPITAL SIZE* = the natural logarithm of hospital beds; *IMPLEMENTATION COST* = dichotomous variable, where 1 = the cost of adoption is high and very high; *EXPERIENCE EFFECT* = the number of years publishing financial accrual statements; *LEVEL OF EDUCATION* (Staff; executives) = Compound average of the level of finished studies (PhD, master, bachelor and secondary level) of accounting department personnel.

***, **, * indicate statistical significance at the 1, 5 and 10% levels, respectively.

The observed F-statistic of the regression is 8.710 and significant at $\alpha = 0.000$ which points at an acceptable goodness-of-fit. The validity threat of multicollinearity is examined with a Pearson and Spearman correlation test and by calculating the tolerance and variance inflation factors (VIF) for all the independent variables. No indication of multicollinearity is found between the different variables⁴⁹. Furthermore, Durbin-Watson statistic is a test to see if the assumption of independent observations is met, which is the same as testing if autocorrelation is present. As a rule of thumb, a Durbin-Watson statistic in the range of between 1.5 to 2.5 indicates independence of observations and thus we may reject the notion that data are autocorrelated (serially dependent), as is the case here. The adjusted R² suggests that 46.7 percent of the overall variation in accounting benefits is explained by the included independent variables.

The results presented in Table 10 indicate that among the five variables tested for effects on accounting benefits, the coefficients of implementation cost, education level of accounting department personnel and implementation problems are the most significant in statistical terms. More specifically, the regression exhibited that a higher level of perceived benefits is positively related with the level of education of the accounting department personnel (staff; executives) and negatively related with the cost of implementing ABAS as well as technical and organizational problems faced in relation to its implementation. On the other hand, the hospital size and the learning experience effect do not seem to exhibit a significant influence on perceived accounting reform benefits.

CONCLUSIONS

This paper presents the “journey” of introducing and implementing an accrual and management accounting system to NHS in Greece. Our findings, based on a sample of 54 public owned hospitals, indicate that the adoption rate (83%) of the accrual basis of accounting in the public health sector is quite satisfactory, when it comes to the financial transaction cycle of the accrual accounting system.

However, the implementation of the cost accrual accounting system has not yet seriously progressed almost 6 years after the declared NHS accounting reform (P.D. 146/03) as only a minority of public hospitals has complied with the respective regulatory requirements of the accounting reform (18,5%) ; although controlling operational costs was one of the main issues which initiated the accounting reform and thus establishing an accurate and updated costing system based on an accrual basis could not be but a precondition for the reform.

Furthermore, this study draws upon the management accounting innovation, and public sector reform literatures to examine some of the factors influencing the perceived benefits of ABAS in Greek public hospitals. Our findings indicate that Greek public hospitals are more likely to exhibit a higher level of perceived benefits from the new accounting regime if they are employing accounting staff and executives of a higher educational level,

⁴⁹ The Variance Inflation Factors (VIF) of the variables which comprise our model are well below the generally accepted critical threshold of 10, ranging between 1.08 and 1.63, and tolerances are of more than 0.20, indications that allude a potential severe problem of multi-collinearity (Kutner et al., 2004; Hair, 1998).

encountered fewer technical obstacles (e.g. Data limitations and collection) and organizational problems (e.g. Top Management commitment) during development phase and have a general perception that accrual accounting bring substantial benefits to healthcare organization without a high implementation and adoption cost. On the other hand, public hospitals that are either of a considerable size, or have acquired familiarization with accrual accounting in previous periods do not exhibit any significant relationship on the perceived benefits

The findings are subject to a number of limitations. Cross-sectional studies as this work presented here can establish associations, but not causality. Another factor that may affect these results is the noisiness of the measures. A mail survey prevents an assessment of the survey respondent's actual knowledge of the accrual accounting, although the surveys were mailed to Financial Managers.

Future research may further examine the relation between expected and actual benefits derived from the implementation of accrual accounting in public hospitals as well as consider incorporating other important contextual variables that have been omitted from other studies and are likely to influence the level of perceived benefits from ABAS adoption. The most notable omitted variables are the: the number of services variant as a proxy measure of hospital complexity; type of hospital (general or specialized); location of hospital (urban or rural); extent of accrual accounting use and compliance; satisfaction of the cash accounting system; CEO educational background and business orientation. In addition, the importance of inter-organizational variables such as professional consultants support and local political support must not be underestimated.

Despite these limitations, this study provides the first empirical evidence of the relation between the level of perceived benefits from ABAS adoption and contingent factors in the public secondary health care sector in Greece.

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