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Management accounting information systems: a case of a developing country: Vietnam

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This study discusses the relationship between management accounting information systems and the relevance and usefulness of those systems in hospitals in Vietnam. In particular, it investigates how hospitals have improved/intend to improve their accounting activities and how they have tried to implement known managerial (accounting) systems to improve efficiencies. The study shows the influence of management accounting in hospitals in an environment that is rapidly changing from centrally governed to a more open capital market environment. Based on survey data from 53 hospitals in Hanoi and surrounding provinces, the study reports whether those environmental changes have resulted in actual or planned changes in management accounting activities. Our results show that in response to environmental and regulatory changes, Vietnamese hospitals have improved accounting functions and are planning to continue their development further. However, the improvement is not always in-line with what is expected in western countries.

Keywords: management accounting information systems; hospitals; Vietnam

JEL Codes: M41; M48; I18

1. Introduction

Healthcare is a significant part of any country's Gross Domestic Product (GDP) and therefore, adequate healthcare management has become important giving the rise of healthcare costs. Attempts to decrease those costs can only be successful if the managers have the appropriate information and if the management accounting information systems within their organizations are designed properly. This study will address how management accounting departments are helping hospital managers to improve efficiency in a developing country: Vietnam.

Vietnam started its move towards an open market economy in the late 1980s and has adjusted many of its regulations to accommodate this goal. Among these changes have been the liberalization of healthcare and medical practitioners' receiving the right to open private hospitals and pharmacies (Flessa and Dung 2004). The healthcare industry in Vietnam has had more than 15 years to change from being fully regulated and supported by the government to less regulation and government subsidy. This change has created an excellent research opportunity to determine whether management accounting systems in hospitals have responded to the changes in regulation and funding and the increased

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healthcare needs. A priori, we expect to see that management accounting in Vietnamese hospitals has changed in response to the environmental (both regulatory and economic) shifts. On the other hand, we may also find that changes in healthcare have been postponed because the industry was not willing to accept changes in accounting practices.

Our results indicate that environmental changes have resulted in the adoption of advanced managerial accounting methods in Vietnamese hospitals during recent years. As Vietnamese hospitals are operating in a more competitive environment, managerial accounting methods are seen as useful tools in decision-making for hospital management. New regulations by the government together with new healthcare developments, for example new technology, influence costs and revenues most in hospitals.

In Section 2, we provide an overview of current managerial issues in healthcare and hospital systems, including background on how hospitals have attempted to control costs, specifically, activity-based management/costing (ABC), Just-in-Time (JIT), outsourcing, and evidence-based management/evidence-based best practice (EBBP). In Section 3, we present a more detailed background description of Vietnam and its healthcare industry. Section 4 reports the data selection and collection. Analysis of our data is reported in Section 5 followed by Section 6 that discusses our findings. The conclusion is in Section 7.

2. Current managerial (cost) issues in the healthcare industry

Healthcare systems have seen many changes, such as horizontal mergers, vertical combinations and creation of managed-care firms, in the last decades. Managed-care firms have now penetrated the US market. Greenberg and Goldberg (2002) show that increased competition led to the formation of vertically integrated systems of hospitals and health maintenance organizations. Most of the evidence in the literature indicates that the healthcare industry adjusts its accounting information system in response to changes in healthcare policies, regulations, and sources of revenue. For example, Hill (2000) reports that many US hospitals without an appropriate management system had to adopt a cost system after the introduction of the prospective payment system by Medicare.

In general, healthcare institutions can be motivated to change if environmental changes demand it. To respond to changes, management accounting needs to be able to provide relevant data; and to create savings, accounting departments must use the data to implement cost savings measures such as ABC, JIT, outsourcing, and more recently EBBP to reduce costs.

Although activity-based costing has achieved some prominence as a technology for managers in the healthcare industry, research shows that it is not widely used in healthcare industry (e.g. Lawson 2005). Since hospitals are more complex than other healthcare providers and thus have greater implementation costs, the results are not surprising. Some have found that ABC as a management tool does not reveal more accurate cost estimations than other conventional techniques of cost allocation and other techniques, such as budgeting, benchmarking, and strategic planning are used more often in healthcare organizations (e.g. Armstrong 2002).

The most likely areas where JIT can be adopted in the healthcare sector are in material management and pharmaceuticals. Another important area for JIT in a healthcare setting is to increase the flexibility of the workforce. Many organizations have tried to solve their staffing issues with the JIT technique. Hospitals have, for example, redesigned their nursing units according to the concept of patient-focused care, which includes the use of workers with multiple skills. Many hospitals in the USA are using external staffing companies with many vendors and units, and also in many different disciplines (Aptel *et al.* 2009).

Outsourcing information technology functions, for example, has long been seen as having high potential for cost savings. The healthcare industry is an IT-intensive industry and regulatory mandates have resulted in increased standardization of transaction processing, security, and privacy information; for example, 29% of information technology in healthcare is outsourced in the USA while this percentage is 48.6% in Taiwan. Hsiao *et al.* (2009) attribute this to a combination of reasons such as strength of Taiwan's software industry and uniformity of Taiwan's single payment system of National Health Insurance. Since labor costs for healthcare workers, as for any other employees in the public sector, are very low in Vietnam, it will be interesting to see whether there is any interest in outsourcing certain activities in hospitals.

Pizzini (2006) examines the relations among cost-system functionality, managers' beliefs about the relevance and usefulness of cost data, and actual financial performance in US hospitals. Her results show that managers believe that systems that supply greater cost detail provide more relevant and useful data. The findings support the idea that more functional management accounting systems supply managers with more relevant data, which in turn is used to make performance-enhancing decisions.

In Section 3, we present a more detailed background description of Vietnam and its healthcare industry.

3. Vietnam and its healthcare industry

Vietnam is located in southeastern Asia, bordering the Gulf of Thailand, Gulf of Tonkin, and South China Sea, alongside China, Laos, and Cambodia.¹ With more than 85 million people, the country has a very high population density.

3.1. Background on political economy

The conquest of Vietnam by France began in 1858 and was completed by 1884, and in 1887, Vietnam became part of French Indochina. Although Vietnam declared independence after World War II, France continued to rule until its 1954 defeat by Communist forces under Ho Chi Minh. Under the Geneva Accords of 1954, Vietnam was divided into the Communist north and anti-Communist south. In 1975, north Vietnamese forces overran the south, reuniting the country under Communist rule.

In 1986, the Sixth Party Congress approved a broad economic reform package that introduced market reforms and set the groundwork for Vietnam's improved investment climate. GDP growth averaged 7.8% per year from 1997 to 2004 even against the background of the Asian financial crisis and a global recession. The economy grew an average of 7.4% from 2005 to 2010.² Joining the WTO in January 2007 has given Vietnam an anchor to the global market and reinforced the domestic economic reform process. Hanoi is targeting an economic growth rate of 7.5–8% through 2012 (CIA 2008).

3.2. The organization of the healthcare delivery systems

Before the Doi Moi³ policy in 1989, the healthcare system was firmly controlled by the central government's Ministry of Health (MOH). However, the level of control has decreased as the government financial support has declined.⁴ Sepehri *et al.* (2003) report that revenues from user charges increased threefold between 1992 and 1998. In 2004, only 27.1% of spending on healthcare came from the public sector (5% from general government spending); the remaining 72.9% came from private sources (Anh

2007). Additionally as medical practitioners have received the right to open private hospitals, the power and control of the MOH has declined drastically and the private healthcare sector has been growing.

Furthermore, as a result of economic development, the healthcare industry in Vietnam uses more advanced facilities and technologies, especially in private hospitals such as the Franco-Vietnamese Hospital (FVH) with its objective of providing service to middle-income households in the Ho Chi Minh City (HCMC) metropolitan area and neighboring provinces (Franco-Vietnamese Hospital 2006). This facility has become a model for the development of private hospitals in Vietnam.

The low cost of labor has given Vietnamese hospitals their main advantage – the relatively low cost of healthcare services.⁵ Treatment at private- (e.g. FVH) and state-owned (e.g. Cho Ray) hospitals, for example, is generally half the cost for similar services in Thailand or Singapore (Anh 2007). This situation has created the possibility of medical tourism. As a result, many new projects for both foreign-owned and local hospitals, including infrastructure upgrades, have started in recent years.

Public hospitals can be classified into three kinds: central general hospitals, provincial general hospitals, and district hospitals. Most central general hospitals are in Hanoi and HCMC. The average number of beds in central general hospitals is 560; for provincial general hospitals, the average is 357; and for district hospitals, 76 beds (Weaver and Deolalikar 2004). The distinction between provincial and district hospitals is based more on the number of beds and facilities than on geography. Although central general hospitals are the largest, the majority of patients are treated at provincial general and district hospitals. Vietnam also has a wide network of more than 10,000 commune-level health centers with at least one medical staff person (Adams 2005).

3.3. The evolution of the healthcare delivery systems: incentives and pricing

Hospital costs differ widely among regions. Weaver and Deolalikar (2004) found higher hospital costs in more populated areas, despite the fact that hospitals in remote areas have higher operating costs because of difficulty of access to supplies. The Red River Delta, where Hanoi is located, and the southeast region, where Ho Chi Minh City is located, were high cost areas. Costs were related to the number of beds, with significantly lower costs at district hospitals.

Hospitals used to charge patients according to a set of common measurements based on standards and regulations approved by the MOH; for example length of stay and number of treatments. Thus, they were able to increase their fees/revenues by increasing the number of patients treated. With increases in costs (the inflation rate is estimated to be 50–60% in healthcare) and in new medical services provided, after increasing hospital fees and charges in 2006, the MOH proposed the following two new methods of pricing:

- (1) A system comparable to diagnosis-related groups.
- (2) A system based on actual services that patients receive during treatment.

Under Decree 10, which grants the hospital director the power to manage the costs and revenues of the facility, a large number of health treatments are now offered on a for-pay basis. User charges are collected mainly at the hospital level and therefore have a great impact on financing hospital activities. Out-of-pocket payments are the major form of financing hospital costs; between 70 and 80% of costs are covered by users of facilities (Lindholm and Thanh 2003). However, the majority of healthcare costs is

related to drugs; for example, in 2000, 80% of healthcare resources were spent on drugs in Vietnam compared to 15% in Sweden (Lindholm and Thanh 2003), costs that are mostly covered by patients.

4. Sample selection and data collection

To collect the necessary information, we designed a questionnaire for those in charge of management accounting (Chief Financial Officers (CFOs) hereafter) in hospitals.⁶ Since hospitals can operate under different ministries in Vietnam, lists from the MOH, Ministry of Defense, Ministry of Transportation, Ministry of Public Security, and Ministry of Post and Telecommunication were consulted for sample selection.

Because it is not common to respond to mailed survey questionnaires in Vietnam, the sample was selected such that answers to questions could be collected during personal interviews. Given our location in Hanoi, all hospitals in Hanoi and within 90 km of Hanoi were selected for this study. The data were collected with the help of 13 MBA students at Hanoi Business School. The students were divided into groups and were assigned specific provinces/hospitals. The data collection process had multiple steps: (1) ask for an introduction from a third party, (2) contact by telephone, (3) arrange a meeting, (4) send the questionnaire in advance for data preparation, and (5) conduct the interview. All interviewees received a thank you gift after the interview was completed.⁷

The sample consists of 30 hospitals in Hanoi and 30 in 9 surrounding provinces. Clinics were excluded from the survey because they have only a few beds and generally no logistics department. Although the number of private hospitals may be increasing, the majority of hospitals in Vietnam are still public hospitals, and this fact is reflected in our sample: 54 (90%) of the 60 were public hospitals, 3 were centers, 1 was an institute, 1 was a private hospital, and 1 was a joint-stock hospital. The sizes of the hospitals were also different: two were medical centers and had no beds (they were later dropped from the sample), 31 had fewer than 200 beds, and 27 had more than 200 beds. The average number of beds was 267, and excluding the two medical centers, the smallest hospital had 12 beds. After deleting hospitals with incomplete data, we had 53 observations: 26 hospitals in Hanoi (12 small and 14 large) and 27 hospitals in the provinces (15 small and 12 large).

Table 1 provides comparative data on the size of the hospitals and total and logistics hospital budgets for 2005. The last two columns of the table report the increases in the budgets from 2000 to 2005. Our data indicate that the hospitals' total budgets increased approximately 67%, with the largest for Hanoi large hospitals at 77% and the smallest for provincial small hospitals at 53%. However logistics budgets did not follow the same pattern. Increases in logistics budgets were only 37%, with the smaller hospitals both in Hanoi and in the provinces receiving the largest increases, averaging 61% and 92%. Given that larger hospitals show smaller increases in their logistics budgets, our results suggest that larger hospitals were able to control logistics costs better than smaller hospitals. Consequently, we have partial evidence that the size of hospitals influences cost control for the logistics functions. In the following section, we report the results of our management accounting survey.

5. Analysis

Our Management Accounting survey contained nine questions related to functions of accounting departments, hospital partnerships and outsourcing practices, and changes

Table 1. Hospital total and logistics budget.

	Number of beds	In 2005 Total budget	Logistics budget	Increase from 2000 to 2005	
				Total budget (%)	Logistics budget (%)
All hospitals (<i>n</i> = 53)	289	1599,731	306,009	66.98	36.77
Hanoi-small (<i>n</i> = 12)	90	705,717	230,525	68.32	92.44
Hanoi-large (<i>n</i> = 14)	516	4228,823	718,127	77.39	45.24
Province-small (<i>n</i> = 15)	90	208,851	49,475	52.57	61.15
Province-large (<i>n</i> = 12)	471	1384,163	324,386	61.53	28.00

Notes: (1) Amounts are reported by CFOs of the hospitals and are translated to US dollars. All questions were communicated in advance so CFOs would have enough time to compile the answers and if necessary review historical data.

(2) The following is reported:

- (a) Average number of beds;
- (b) Average total hospital budget; and
- (c) Average logistics hospital budget.

(3) The last two columns report increases in total and logistic budgets from year 2000 to 2005.

necessary to improve hospital operations. The following section contains the results of the survey and our findings. Furthermore, our analysis provides information on how the results differ when the data are grouped by hospital location and size.

5.1. Summary of survey responses

When asked about the usefulness of the management accounting information system, the CFOs reported that their predominant use of the accounting information system was related to short- and long-term budgeting and control and to cash flow management. They also indicated that they did not believe accounting information was helpful in making decisions related to medical treatments: measurement of the cost of medical treatments, measurement of the cost of nonmedical operations, usefulness of medical treatments, and the need to acquire additional technology. Table 2 provides more details on the perceived usefulness of management accounting information. It shows the percentage of responses with χ^2 test results for independence.

Since we anticipated that the answers of our survey questions will be different when size and location of hospitals are considered, we provide in each of our tables information for all hospitals and for hospitals sorted by location and size. CFOs in hospitals in Hanoi and Provinces as well as CFOs in small and large hospitals have very similar beliefs for the use of accounting information for budgeting and control and cash flow management. The measurement of cost of medical treatments is significantly different for hospitals sorted by size with a χ^2 of 10.8 ($p=0.0044$) and the usefulness for measurement of the cost of medical treatments is different for hospitals sorted by location with a χ^2 of 16.3 ($p=0.0003$)

Table 2. Perceived usefulness of management accounting information.

	Measurement of medical treatments (%)	Measurement of cost of medical operations (%)	Usefulness of medical treatment (%)	Measurement of used and unused capacity (%)	Usefulness of logistic department (functions) (%)	Budget setting and budget control (%)	Cash flow control (%)	Price setting for medical treatments (%)	The need to acquire additional technology (%)	Long-term planning (%)	Employees' performance evaluation (%)	Control of contracts with external parties (%)	Information for legal and regulatory obligations (%)
<i>Panel A: All hospitals</i>													
All	**	*			***	***	***		***	***	**	**	**
1 (n=53)	26	31	27	21	8	9	9	22	14	6	12	13	21
2	55	51	42	44	41	28	26	34	57	38	48	48	38
3	19	18	31	35	51	62	64	44	29	56	40	38	56
<i>Panel B: Hanoi vs. province hospitals</i>													
Hanoi					*	*	*			*		*	
1 (n=26)	35	38	55	24	8	15	19	35	20	8	17	15	31
2	50	50	32	44	56	27	23	30	52	46	52	58	27
3	15	13	14	32	36	58	58	35	28	46	30	27	42
Province	**		**		***	***	***	*	**	***	*	*	**
1 (n=27)	19	26	4	19	8	4	0	11	8	4	7	12	12
2	59	52	50	44	27	30	30	37	62	31	44	38	19
3	22	22%	46	37	65	67	70	52	31	65	48	50	69
<i>Panel C: small vs. large hospitals</i>													
Small	***	*			*	***	***		***	*			*
1 (n=27)	22	27	21	26	12	4	4	15	20	12	15	19	15
2	74	58	42	33	36	30	26	31	64	31	38	42	27
3	4	15	38	41	52	67	70	54	16	58	46	38	58
Large		*		*	**	*	*		*	**	*	*	
1 (n=26)	31	36	33	16	4	15	15	29	8	0	8	8	27
2	35	44	42	56	46	27	27	38	50	46	58	54	19
3	35	20	25	28	50	58	58	33	42	54	33	38	54

Notes: (1) 1 = very low and low; 2 = adequate; 3 = good and very good.
(2) A χ^2 test for independence for each variable was used with *0.05; **0.01; and ***0.001 level.

Table 3. Effect of the following on revenues (cost) during the previous 5 years.

Revenues				Costs			
New regulations by the government (%)	New healthcare developments (e.g. new technology) (%)	Changes in specialization (%)	Changes as a result of outsourcing (%)	New regulations by the government (%)	New healthcare developments (e.g. new technology) (%)	Changes in specialization (%)	Changes as a result of outsourcing (%)
<i>Panel A: All hospitals</i>							
All (n = 53)	***	***	***	***	***	***	***
1	0	0	0	2	8	8	15
2	25	47	57	43	33	46	62
3	75	53	43	55	60	46	23
<i>Panel B: Hanoi vs. province hospitals</i>							
Hanoi (n = 26)	***	**	**	***	**	*	
1	0	0	0	0	4	8	20
2	28	46	43	38	40	44	55
3	72	54	57	62	56	48	25
Province (n = 27)	**	**	***	**	**	*	***
1	0	0	0	4	11	7	11
2	22	48	68	48	26	48	67
3	78	52	32	48	63	44	22
<i>Panel C: small vs. large hospitals</i>							
Small (n = 27)	***	**	***	**	**	*	***
1	0	0	0	4	8	11	8
2	35	48	65	44	35	44	71
3	65	52	35	52	58	44	21
Large (n = 26)	***	**	**	***	**	**	
1	0	0	0	0	8	4	22
2	15	46	48	42	31	48	52
3	85	54	52	58	62	48	26

Notes: (1) 1 = greatly decreased and decreased; 2 = stayed about the same; 3 = increased and greatly increased.
(2) A χ^2 test for independence for each variable was used with *0.05; **0.01; and ***0.001 level.

We measured the effect of changes in healthcare environments by asking CFOs about the effect of these changes on the hospital's revenues and expenses. Specifically, we questioned CFOs with respect to the effect of four environmental changes: new regulations by the government, new healthcare developments (e.g. new technology), changes resulting from the hospital's specialization, and changes resulting from outsourcing initiatives or new partnerships. Their responses indicate that new regulations have a costlier effect on their operation than other changes. They also report that changes other than new regulations, on average, result in a net increase in revenues (after costs are considered). This result is expected as most regulations limit revenues and/or increase the level of required services (hence increasing costs). On the other hand, when organizations introduce change without outside influence, most changes are intended to improve the organization's financial position, that is, increase net revenues. Table 3 contains details of CFO responses to this question. All four environmental changes are considered to have effects on revenues and costs (all p -values are at least smaller than 0.01). None of those environmental changes have a significant effect for hospitals by size or location.

Question 6 of the survey asked how CFOs used cost and revenue information in certain decisions. This question is different from that reported in Table 2 (question 5 of

Table 4. How often revenues and costs are considered for the following decisions.

	Choice of medical treatments (%)	Choice of hospital specialization (%)	Choices of infrastructure (%)	Hiring and firing (%)	Choices/ methods of logistics (%)
<i>Panel A: all hospitals</i>					
All	**	***	***	***	
($n = 53$)					
1	52	56	69	81	38
2	15	12	12	13	22
3	33	33	20	6	40
<i>Panel B: Hanoi vs. province hospitals</i>					
Hanoi		*	***	***	
($n = 26$)					
1	52	60	71	81	29
2	11	11	11	15	7
3	37	37	22	4	44
<i>Panel C: small vs. large hospitals</i>					
Small	*		***	***	*
($n = 27$)					
1	44	48	73	83	50
2	11	15	12	17	8
3	44	37	15	0	42
Large	*	**	**	***	
($n = 26$)					
1	60	64	64	78	25
2	20	8	12	9	38
3	20	28	24	13	38

Notes: (1) 1 = never and very seldom (annually);

2 = seldom (two or three times a year); and

3 = sometimes (monthly) and all the time (weekly or more).

(2) A χ^2 test for independence for each variable was used with *0.05; **0.01; and ***0.001 level.

Table 5. Fixed costs and logistics costs to total costs.

	Fixed costs (%)	Fixed costs (five years ago) (%)	Logistics costs (%)	Logistics costs (five years ago) (%)	Fixed costs in five years (%)
All ($n=53$)	79	79	23	22	77
Hanoi ($n=26$)	75	78	26	24	74
Province ($n=27$)	83	80	20	19	81
Small ($n=27$)	83	75	25	20	80
Large ($n=26$)	65	60	15	15	75

Notes: (1) fixed costs and logistics costs are compared to total costs;
 (2) all are estimates.

the survey), as the information in Table 2 is related to the usefulness of accounting information in general and it is not limited to revenues/costs (e.g. CFOs might have considered information on planning and control in their answers reported in Table 2). In response to question 6, as Table 4 reports, CFOs mentioned that they used revenue and cost information mainly for logistics decisions and very seldom for choices of infrastructure, hiring and firing decisions, choices of medical treatments, and choices of hospital specialization.

A χ^2 test for independence showed that choices/methods of logistics are significantly different for hospitals based on size with a χ^2 of 7.2 ($p=0.028$) and for hospitals based on location with a χ^2 of 6.5 ($p=0.039$). Given the significant level of logistics costs (see Table 1), we expected that accounting information played a significant role in logistics decisions. Interestingly, the revenue/cost information is not used for choices of medical treatment and items that have a more long-term effect.

The management of a hospital does not have control over many of the costs. Most of the fixed costs are incurred without the management's control. For example, the rental fees and salaries of cleaning staff will need to be incurred to continue operations. Therefore, we asked what the estimated fixed costs compared to total costs were for the hospitals. Fixed costs were anticipated to be around 80% of total costs. Only large hospitals reported fixed costs of approximately 65%. Those hospitals also showed only 15% for logistics costs. Table 5 provides a summary of the responses.

Interestingly, CFOs did not believe that the percentage of logistics to total budget had changed from 2001 to 2005; they reported almost the same percentage (with one or two percent fluctuation) while larger hospitals had reduced this cost substantially in 5 years as we could see from our budget data.⁸

When we asked CFOs what they thought was needed to improve their hospital operations, they ranked the following the lowest: hiring more nurses, Entering into long-term contracts with suppliers, admitting more patients to utilize extra capacity, outsourcing parts of logistic operations, and reducing the total costs by outsourcing. Hiring more nurses is not relevant for their improvement. Creating incentive systems for doctors to save costs is the most desirable improvement for all hospitals followed by acquiring new technology and infrastructure investment (Table 6).

CFOs do not believe that their accounting information system should be used for decisions related to outsourcing and management of excess capacity. A χ^2 test for independence revealed that for hospitals based on size, outsourcing part of logistic operations is significantly different with a χ^2 of 7.2 ($p=0.024$). This holds also true for reducing the total costs by outsourcing with a χ^2 of 11.9 ($p=0.0026$).

Table 6. Operation improvements.

	Infrastructure investments (%)	Purchase more equipments (new technology) (%)	Enter into long-term contracts with suppliers (%)	Admit more patients to utilize extra capacity (%)	Outsource parts of logistic operations (%)	Hire more medical doctors/ specialists (%)	Hire more nurses (%)	Create incentive system for doctors to save costs (%)	Reduce the total costs by outsourcing (%)
<i>Panel A: All hospitals</i>									
All	***	***	*		***	**		***	**
<i>(n=53)</i>									
1	4	2	15	25	36	13	30	4	33
2	26	25	44	29	9	40	43	13	15
3	70	74	40	46	55	47	26	83	52
<i>Panel B: Hanoi vs. province hospitals</i>									
Hanoi	***	***			*			***	*
<i>(n=26)</i>									
1	0	4	24	28	35	15	31	8	19
2	35	23	48	28	12	54	50	19	23
3	65	73	28	44	54	31	19	73	58
Province	***	***	*		**	**		***	*
<i>(n=27)</i>									
1	7	0	7	22	37	11	30	0	46
2	19	26	41	30	7	26	37	8	8
3	74	74	52	48	56	63	33	92	46
<i>Panel C: small vs. large hospitals</i>									
Small	***	***			*			***	**
<i>(n=27)</i>									
1	7	0	23	19	52	22	41	7	52
2	2%	22	35	37	11	30	33	15	4
3	67	78	42	44	37	48	26	78	44
Large	***	***	*		***	**		***	*
<i>(n=26)</i>									
1	0	4	8	32	19	4	19	0	12
2	27	27	54	20	8	50	54	12	28
3	73	69	38	48	73	46	27	88	60

Notes: (1) 1 = strongly disagree and disagree; 2 = neutral; and 3 = agree and strongly agree.
(2) A χ^2 test for independence for each variable was used with *0.05; **0.01; and ***0.001 level.

6. Discussion

We anticipated that the relationships between management accounting information and its perceived usefulness will be different when size and location of hospitals are considered. As both Weaver and Deolalikar (2004) and Pomberg *et al.* (2009) indicate, provincial hospitals have different characteristics from those in large cities. In addition, Aptel *et al.* (2009) and Pomberg *et al.* (2009) show that larger hospitals are more able to adapt to changes than smaller hospitals.

Environmental changes and their effects on costs and revenue have no significant relationship for samples based on size and location. This finding is reasonable as the environmental effect is external to the hospitals and may influence the usefulness of accounting information similar for all hospitals. New regulations are most important for cost considerations whereas new healthcare developments (e.g. new technology) have the highest revenue effect.

When we divided the sample based on size and location (small/large and Hanoi/provinces), we observe that the perceived usefulness of management accounting information for the measurement of costs of medical treatments is significantly different for small and large hospitals, while the usefulness of medical treatments is seen differently between Hanoi and provincial hospitals. Only a few small hospitals consider management accounting information as useful in their decision to measure the cost of medical treatments and much more provincial hospitals than Hanoi hospitals consider it to decide for the usefulness of medical treatments.

Costs and revenue effects on decisions of choices and methods of logistics are significantly different for both: hospitals based on size as well as Hanoi and provincial hospitals. Hanoi and large hospitals are taking revenues and costs more often into account for those choices and methods. As mentioned above larger hospitals had reduced logistics cost substantially over the last years.

These results can be explained by the different reaction of the provincial and Hanoi hospitals to Decree 10, which grants the hospital director the power to manage the costs and revenues of the facility. Seventy percent of central hospitals (including Hanoi) had adopted this Decree by 2005 while only 40% of provincial hospitals had adopted Decree 10 by 2005 (Lieberman and Wagstaff 2009, p. 128). Consequently, the cost/revenue information may be considered more relevant for Hanoi hospitals than for provincial hospitals that had not adopted this Decree. A similar argument can be made for the fact mentioned above that provincial hospitals use more other management accounting information than Hanoi hospitals do. Since these hospitals did not manage their cost and revenues, they emphasized using other useful accounting information.⁹

When we inspected answers to question 9 in the survey questionnaire related to needed improvements for their hospital operations, we found some interesting answers. Generally, it seems that CFOs do not believe that their accounting information system should be used for decisions related to outsourcing and management of excess capacity.¹⁰ But large hospitals do consider outsourcing parts of logistics operations and reducing total costs by outsourcing much more often compared to small hospitals. This is not unexpected. Given the low labor cost, it is more interesting for larger hospitals to outsource. In general, we propose that the hospitals in our sample do not believe that savings through outsourcing and managing excess capacity are significant.

Hiring more nurses is not seen as necessary. This is interesting because Vietnam has a much lower ratio of nurses to physicians than the most countries.¹¹ Creating incentive systems for doctors to save costs is the most desirable improvement for all hospitals. The compensation scheme for doctors has not been changing, while the country was undergoing a transition from a state-controlled healthcare system to a consumer-driven model. People working in private industries are seeing their salaries and standard of living go up but doctor's have not seen this change.¹² Physicians are not usually part of the accounting information system process for financial information. To improve the conditions for them and creating incentives can lead to a greater use of accounting systems and thus, long-term effects in cost reductions.

If relevant aspects of society have not been adjusted for changes in the healthcare industry, we may find that the industry will not accept or implement appropriate changes. For example, Cichon (1991) emphasizes that transition from a centrally planned healthcare system to a mixed and market-oriented system, requires a transformation in the social system also. That is, if the labor market had never supported healthcare costs and the responsibility was that of the central government, changes in the labor market should also accompany a change in the financing of the healthcare system from the central government to the private sector. Otherwise, the transformation will not have the expected results.

7. Conclusion

Healthcare is a significant part of any country's GDP, no matter how it is managed (private or public). Given the rising cost of healthcare, it is not surprising that hospitals attempt to increase their revenue and/or decrease their costs. These attempts can only be successful if the managers have the appropriate accounting information.

Studying healthcare systems in other-than-developed nations enables researchers to examine changes in hospitals in a rapidly changing regulatory and economic environment. These changes create an excellent research opportunity to determine whether management accounting in hospitals have responded to the changes in regulation and funding and the increased healthcare needs, an opportunity that is no longer available in developed countries. Vietnam provides such an opportunity. Vietnam's healthcare industry will continue to play a key role in the country's economic development.

Vietnam has implemented various healthcare policies addressing key issues in healthcare reform including healthcare system financing. Different methods have been suggested for improving effectiveness and reducing costs in the healthcare industry. These improvements can only take place if accounting information systems provide appropriate information.

The current study extends prior research by obtaining information on the current and expected status of management accounting in Vietnam. We created a set of data based on responses to a survey questionnaire collected from those in charge of accounting departments.

Although we expected to find different levels of relationships between the accounting in small and large hospitals, we did not find a meaningful pattern to show that larger hospitals have been more successful in developing accounting functions. We also found only some significant differences between hospitals located in Hanoi and those located in provinces. It is possible that the small sample size has contributed to our lack of findings.

Vietnamese hospitals have been reluctant to adopt some of the methods that US hospitals consider necessary for costs savings such as collaboration and outsourcing. We found a corresponding lack of interest by CFOs in accounting data that are needed for collaboration and outsourcing. We suggest that lack of interest in such methods could be related to the low cost of labor (and labor capacity) in Vietnam.

This study is the first of its kind to address management accounting system information and its perceived usefulness in Vietnamese hospitals. We did so by collecting data from those in charge of management accounting. We did not address how management accounting information is linked with logistic functions in Vietnamese hospitals. Such an extension is warranted, as it will further our understanding of the effect of accounting information systems on logistics functions and costs. If we observe changes in the administration of healthcare (such as in logistics), then we should see corresponding changes in the system that provides the relevant information for appropriate logistics decision-making: management accounting.

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Notes

1. The information about Vietnam was collected mainly from the CIA's World Fact Book-Web-site for Vietnam at (<https://www.cia.gov/library/publications/the-world-factbook/geos/VM.html>) accessed on 22 June 2009.
2. From: http://www.indexmundi.com/vietnam/gdp_real_growth_rate.html, accessed 20 August 2010.
3. The Doi Moi "renovation" was first introduced in 1986. The reform focused on economic efficiency, while the political system remained unchanged.
4. The government's contribution to the health care industry declined from 68.8% in 1994 to 46.8% in 2002. (Sources: MOH 1996, 2000, 2002, Department of Therapy, reported in MOH (2005)).
5. However, the cost of labor is on the rise. For example, given the change in government policies since the late 1980s, even fully subsidized medical education has changed to a system very similar to that of the USA; combining student-paid tuition and fees with some government subsidies (Bicknell *et al.* 2001).
6. The questionnaire was written in English, translated to Vietnamese, and finally translated back to English to make sure that the Vietnamese and English questions carried the same meaning. The questionnaire is available upon request.
7. Not all contacts were successful. Some could not meet; in one case, we made a mistake in the spelling of the name and the interview failed. When interviewees were concerned about providing information which was internal to their hospitals, we provided assurance that the information would be reported in the aggregate.
8. Large hospitals in Hanoi and provincial hospitals decreased their logistics to total budget by 4% and 6%, respectively.
9. The number of observations in each subsample decreases as we divide the sample into small/large and Hanoi/provinces. Our results in the smaller samples must be viewed with caution.
10. In general, Vietnamese hospitals outsource their functions a lot less than do those in western countries (Aptel *et al.* 2009, reported that more than 50% of US hospitals outsourced the linen function).
11. In 2002, Vietnam had 7.7 nurses and 5.7 physicians per 10,000 populations. Source: <http://www.who.int/healthinfo/statistics/whostat2005en1.pdf>, (Accessed 5 April 2011).
12. Bribery and under the table payments are common in Vietnamese hospitals.

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