The Irish Accounting Review (2006), Vol. 13, No. 2, 21-34

PRELIMINARY FINDINGS ON ABC ADOPTION IN CANADIAN HOSPITALS: REASONS FOR LOW RATES OF ADOPTION

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ABSTRACT

Activity based costing (ABC) can be traced to the years before the Second World War, but its popularity in recent years has been widespread following the Johnson and Kaplan (1987) article. Both teaching and practice have been impacted by the extensive research and literature in this area. However, it is evident that there has not yet been widespread successful implementation of ABC. Adoption rates have been lower than expected given the potential advantages of using ABC suggested by leading academics and professional organisations around the world. We found through initial surveys that there are low rates of adoption of ABC in hospitals in Ontario. Since hospitals are under severe budgetary pressures, have a high variety and complexity of cases and a high level of shared resources, we would expect more adoption of ABC. We use the approach suggested by Scapens (1990) to ascertain the determinants of this low level of adoption. Our studies focus on four hospitals in Ontario, Canada, using surveys and interviews. Our preliminary findings are that the application of social theory, as suggested by Scapens (1990), provides useful explanations for the low ABC adoption rates in hospital care in Canada.

INTRODUCTION

Today, there is a strong media focus on the increasing cost of health care in Canada, Ireland, the United Kingdom (UK), the United States (US) and, indeed, in many other countries around the world, leading to public policy and private sector efforts to contain these costs. This gives rise to a common concern in these countries - how best to control the rate of growth in health care expenditures whilst still delivering good health care. Total (or macro) health care costs are driven by numerous and complex micro level decisions by politicians, clinicians and managers. Therefore, macro cost control can only be achieved through reference to micro level analysis.

Hospitals have increasingly adopted cost accounting and case mix analysis systems (Orloff, Little, Clune, Klingman and Preston, 1990). Activity cost systems are gaining considerable attention in industrial settings that are competitively constrained because these systems provide a link between cost drivers and

organisational activities. Although the development of micro-activity costing seems apparent in the use of diagnostic related groups (DRGs), cost escalation and the difficulty of making informed decisions remain unresolved problems. One approach to better understanding and controlling these trends is the implementation of "total cost management", which relies on an activity based costing framework (Hoyt and Lay, 1995). The main objective of this paper is to assess the level of implementation of case costing (an example of activity based costing or ABC) in the health care sector in Ontario. We are particularly interested in gaining some insight into the reasons for the level of adoption of ABC and the barriers to its adoption in Canadian hospitals.

The path-breaking Yale study by Fetter, Shin, Freeman, Averill and Thompson (1980) entitled *Case Mix Definition by Diagnostic Related Groups*, ushered in a decade of discussion and debate on the linkage of costs to clinically-specific criteria. Research on DRGs actually preceded the activity costing principles introduced by Cooper and Kaplan at Harvard in the mid-1980s. Also, as early as 1983, the "program expense model" introduced by Hayes and Lay (1983) traced real resource consumption in the Canadian hospital setting with an input-output methodology (Hoyt and Lay, 1995). With activities as the focus, a new definitional framework renders a different picture of the organisation to be examined more closely. The new system employs computer technology to accumulate more detailed costs by activity (Ostrenga, 1990).

The focus of this paper is on low rates of adoption of case costing in Ontario, but there are parallels in the Irish experience (Eden , Maingot and Doyle, 2006). From the case sites in Ontario and in Ireland, no public teaching hospital or private not-for-profit hospital has fully implemented an ABC system. A private for-profit hospital in Ireland is an exception to the rule, where fully fledged case costing has been implemented(Eden et al., 2006). There are no for-profit hospitals in Ontario.

While the intention in Canada was to link funding to case costing, the reality is that the link has been very marginal. Incremental budgeting remains the main funding mechanism. In Ireland, a portion of hospital funding is incremental and a portion is linked to case mix measurement.

OBJECTIVES OF THE PAPER

The common argument is that firms producing many different, complex products from common facilities will have the most need for, and receive the most benefits from, ABC. In addition, we expect that firms facing fierce price competition would have the most need to use ABC information to improve their measures of cost and identify the most profitable products or services. Although the beginnings of ABC can be traced to manufacturing, especially as firms faced global price competition, the approach is equally applicable to hospitals. Cooper and Kaplan (1999) suggest that organisations, in looking to demonstrate the potential benefits from building an activity-based cost system, can start with two rules to help guide the search for ABC applications.

1. Look for areas with large expenses in indirect and support resources.
2. Look for a situation in which a large variety exists in products, customers or processes.

Although these principles were developed in the context of business, we believe that they can be applied equally to the health care sector.

Ontario hospitals typically have 500 Case Mix Groups (CMGs) with four levels of intensity and a high proportion of indirect costs (typically 40 to 45 per cent of total costs). This would seem to satisfy the Cooper/Kaplan criteria for ABC costing. The Ontario Case Costing Project (OCCP) both piloted and implicitly recommended the adoption of case costing in hospitals. The pilot hospitals were funded by OCCP to implement case costing and they did so by 1996. All hospitals in Ontario were provided with a copy of the *Guide to Case Costing* in that year to ensure comparability. One can infer from this action that case costing was intended for all hospitals in Ontario. However, this has not occurred. Not only has there not been widespread application of case costing, but the number of pilot hospitals dropped from 13 to nine. It is important to point out that the adoption of case costing was voluntary, although the adopting hospitals were offered funds for implementation.

In light of the above, the main objective of this paper is to assess the low rates of adoption of case costing (ABC) in hospitals in Ontario. We are particularly interested in gaining insight into the reasons for low rates of adoption and the barriers to adoption.

PREVIOUS RESEARCH

Hospitals in Canada, Ireland, the UK, the US and elsewhere in the world have used a variety of costing approaches. One such method is the "top down" costing which involves breaking down department or division expenditures to obtain procedure-level costs (Travis, 1987). The most prevalent top down costing approach is called ratio of cost to charges. This method estimates procedure-level costs by computing an overall ratio of departmental aggregate costs to charges and applying this ratio to charges for individual procedures (Orloff et al., 1990). It should be noted that costs derived through this method are based on aggregate information and may not accurately reflect the actual costs of a particular procedure provided by a department (Burik and Duvall, 1985; Schimmel, Alley and Heath, 1987).

An alternative approach that hospitals are increasingly adopting is known as "bottom up" costing. This approach tracks specific costs at the event level; that is, the labour, materials and overhead cost associated with a particular procedure are determined as the procedure is being performed (Travis, 1987). The cost derivation referred to above may use actual costs. However, while the actual costs approach is one of the most precise costing methods, it entails extensive effort and expense (Orloff et al., 1990). This method appears to be similar to the activity based method (case costing) advanced by Cooper and Kaplan (1992) and duplicated by others in

the UK (Innes and Mitchell, 1995, 1997; Innes, Mitchell and Sinclair, 2000), in Ireland (Clarke, Hill and Stevens, 1999; Pierce and Brown, 2004), in Canada (Nicholson and Armitage, 1993) and elsewhere.

Another bottom up costing approach being used either alone or in combination with the actual costs method is based on relative value units (RVUs). This method obtains procedure-specific costs by first allocating costs to the major components (e.g. direct labour, materials, overheads) associated with performing a departmental service. RVUs are then developed based on the relative share of the cost components required to perform the procedure. This method enables managers to compare resource consumption and related costs across procedures and services within a department. The RVU approach is increasingly found in more advanced costing systems in hospitals and is often used in costing and pricing physician services (Baptist, 1987).

According to the literature, the most advanced costing method used in hospitals is standard costing (Orloff et al., 1990). Like the RVU approach, this method allocates costs to associated major components including labour, material and overhead, and, in turn, to individual procedures. Standards are then set based on expectations of normative resources required to complete a procedure or to perform a service using efficient and effective methods. Standard costing goes one step beyond both the actual cost and the RVU approaches, however, by applying variance analysis to measure performance more critically (Bolster and Binion, 1987). The application and precision of these costing methods depend on the financial data collection methods employed. Hospital financial data are generally gathered at the department level, the procedures level or both (Orloff et al., 1990). While costing information systems can be free from errors or mistakes, the information cannot have accuracy in the sense of being exact or precise due to the allocations involved in obtaining total costs of procedures and services (Hill, 2000).

Similarities between Canada and Ireland

In Ireland, a key problem encountered in the implementation of ABC was the lack of sophistication of the information systems in collecting the activity data (Eden et al., 2006). As significant work is underway regarding hospital information systems and electronic patient record systems, this may result in an easier implementation of ABC in the future. Difficulties associated with information systems were also experienced in Canada.

There were also similarities between the two countries in respect of the reasons for adoption of ABC: more accurate cost information, improved insight into cost causation, improved cost control, better use of resources, medical inflation and advances in medical technology. The champions for ABC in both Canadian and Irish hospitals were the directors of finance or the Vice Presidents (VPs), Finance. (Eden et al., 2006) A further similarity is that hospital funding is not directly linked to case cost in either Canada or Ireland. Doctors in both Canada and Ireland have no direct incentives to optimise health care costs since their compensation is not tied to the hospital budget and, in most sites studied, they are not directly involved in the management of the hospital's budget.

Differences between Canada and Ireland

According to Eden et al. (2006), no Irish acute public teaching hospital or other not-for-profit hospital has fully implemented an ABC system. Varying degrees of adoption of activity based concepts and principles were employed in each of the above case sites (Doyle, 2000). The private for-profit hospital is an exception to the rule (Eden et al., 2006). This case site is a classic illustration of the shift from ABC to activity based management as it demonstrated how ABC could be used as a costing tool and as a strategic tool to inform strategic management decisions. The private not-for-profit hospital adopted ABC solely to use it as a negotiation tool with the health insurer. It is only in the acute public teaching hospitals that attempts are being made to embed the principles of ABC into the budgetary process and to use this information to engage clinicians in hospital management. The Irish evidence suggests that most hospitals adopt a hybrid form of ABC and full costing, whereas in Canada the adoption of case costing has been declining over the last decade.

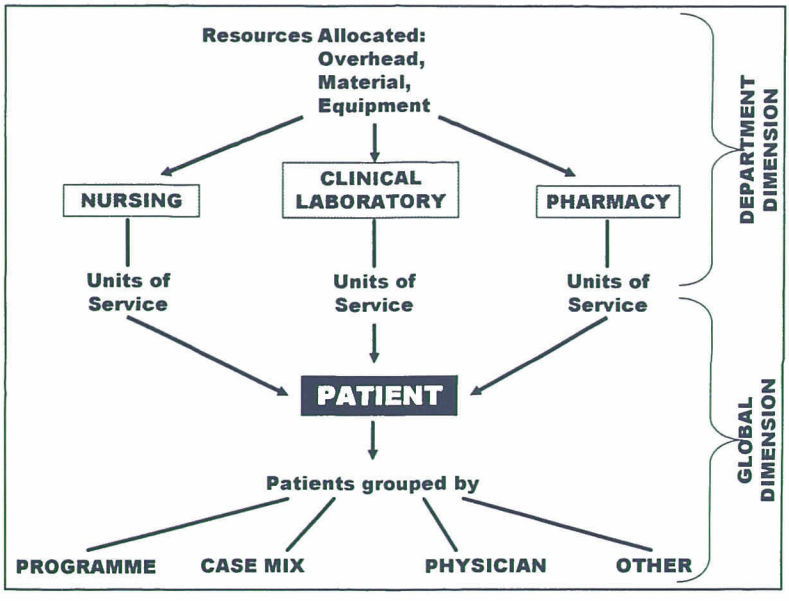
While the intention in Canada was to link funding to case costing, the reality is that it has been very tenuous. Incremental budgeting remains the main funding mechanism. In Ireland, a portion of hospital funding is incremental and a portion is linked to case mix measurement - inpatient budget (20 per cent) and the day case budget (10 per cent). In the future, should funding be directly linked to activity (funding per DRG, for example, or funding per procedure), there may be an incentive to fully implement an ABC system (Doyle, 2000).

ONTARIO CASE COSTING PROJECT (OCCP) 1995

The OCCP (1995) is a project to gather patient level case data. This project was championed by the VPs, Finance, of hospitals in Ontario in the late 1980s. Historically, financial and management reporting in hospitals have been geared to tallying costs and reporting them by functional centre (department or cost centre). It is highly resource intensive to attempt to retrieve workload data on individual patients or groups of patients if done on a special one time approach from that historical data. The case costing approach proposes to generate patient costs by integrating financial, clinical and statistical data. The key is to gather patient specific data as a by-product of care delivery documentation and communication.

The case costing document lays out a four step approach[1] to tracking direct costs and allocating indirect costs - by identifying cost drivers - to patients and programs. These are the principles of ABC costing as advocated by its proponents including Cooper and Kaplan (1992, 1999) and others. The initial data for 1995 represents approximately 250,000 patient discharges, 15 per cent of hospital costs in Ontario and 99 per cent of the case types. This sample provides results that are comparable for the past five years for all hospitals. The OCCP patient level data allows an initial analysis by "patient service". A four step process was used to get to active data collection; the first three were to verify the validity of the process and data reliability prior to the pilots. (See **Figure 1** below)

FIGURE 1: CONCEPTUAL APPROACH TO CASE COSTING



The OCCP started in July 1992 in a partnership with the Ontario Hospital Association and the Ontario Ministry of Health. Case costing as proposed by the OCCP is a form of ABC, where the cost objects are patients and groups of patients. Case costing is a guideline for government funding to validate or replace Resource Intensity Weights with Ontario Case Weights. The case costing system was in place by 1994/95 and the first costing results under this method were reported in 1996. The Senior Management Committee responsible for implementing case costing throughout Ontario never followed through with the recommendation and a consequence of this was that most hospitals have not implemented case costing (Lay, 2003). In response to this low level of implementation, the Ministry of Health is investigating possible incentives to encourage adoption. They have funded a study by the Change Foundation that reported on this matter in October 2004 (Murray, Hannam and Wong, 2004). The Change Foundation was interested in how case costing could assist hospitals with strategic decision making and program and financial management.

RESEARCH METHODOLOGY AND DESIGN

Case Study – Scapens

We chose the case study approach to answer the research questions. We designed a questionnaire based on the work of Nicholson and Armitage (1993) to test the Cooper/Kaplan rules and to identify the level of adoption. We interviewed key personnel in four hospitals following the Scapens approach to case study (1990). Scapens (1990) argues that case studies allow us the possibility of understanding

the nature of management accounting in practice where we can study techniques and systems directly. He argues, as do Johnson and Kaplan (1987), that there may be differences between the formal systems and what managers actually use. Our case studies are aimed at what Scapens (1990) calls the Explanatory Case Study, although he points out that the differences among the different types is not clear cut. Our focus is on the specific case(s) to identify links, or lack of, between theory and practice.

Some of the key limitations of our approach are as follows. We are limited to a small sample size due to time limitations and lack of homogeneity of hospitals which would allow mail out. There is also a high likelihood of interviewer bias which is partly offset by the structured questionnaire.

Social Theory

Scapens (1990, p. 268) describes case study research grounded in social theory as follows:

> To study management accounting as a social practice, it is necessary to look at the relationship between social action and the dimensions of social structure. This will involve locating structures in both time and space i.e. setting them in their wider social context and examining how they have evolved through time.

This approach implies that the management accounting system is part of a legitimisation of organisational activity and a source of power in the organisation. As he points out, such systems do not arise as a result of economics based theory or positive theory; the social actors shape the practice.

The following steps in obtaining case study evidence are advocated (Scapens, 1990):

1. Collecting evidence:
   This involves collecting formal and informal evidence, and the researchers should be alert for evidence contrary or in agreement with theories or ideas from the review of the literature and previous research.
   Typical approaches involve interviewing managers, observing meetings and acquiring documentation. Sometimes informal information is an indicator of the validity of information sources.
2. Assessing evidence:
   The researcher validates or assesses the evidence by comparing it with other evidence dealing with the same issue. Other evidence might be interviews with other subjects, records checked and observations. If characteristic distortions emerge about particular sources, the researcher will be able to verify the information from that source. In addition, the researcher should attempt to validate his/her own interpretations of the evidence to avoid personal bias.
3. Identifying and explaining patterns:
   As the research progresses, patterns and inconsistencies should emerge in the case that may be related to patterns discovered in other cases. The pattern model developed from the cases should always be compared to existing theories.

Research findings: cases

We conducted interviews with staff of four hospitals: the Chief Executive Officer (CEO) at Hospital A; the VP, Finance, and the Director, Decision Support, at Hospital B; the Chief Operating Officer (COO), Cancer Care Facilities, C; and the CEO of Hospital D. We used a structured questionnaire carried out in an informal setting[2]. These interviews were conducted in the autumn of 2004 and the winter of 2005.

Case 1: CEO, small, non-teaching hospital

This hospital is a small, non-teaching hospital located in a town about 20 miles from a major centre. This hospital adopted case costing on a voluntary basis and was one of the hospitals in the pilot project.

- Cost accuracy/cost drivers

The CEO said that 80 per cent of costs were caused by 20 per cent of cases. He indicated that more accurate cost information was sought by patient and by physician for purposes of cost control, cost causation, and the impact on cost causation on budget negotiations. He indicated that there is systemic lack of control in hospital costing that drives the need for case costing. The increased use of technology – MRI scans and the like – has increased the share of indirect cost and, therefore, the need for more sophisticated costing.

- Champions[3]

Little interest was shown by senior management or physicians, other than those at the pilot hospitals at the time of the inception of case costing, and he referred to the fact that the champions of case costing were the VPs, Finance, in hospitals in Ontario, not line staff.

- Problems encountered

The major problems encountered in the implementation of case costing were the lack of standardised care maps and medical records. The coding of medical records is a highly manual and subjective activity. Standardised care maps provide the treatment protocols to be followed for particular illnesses. Medical records provide data for case costing – nursing hours, imaging records, drugs used, patient stay and so on. They regarded case costing as just another task to transfer information to another record.

- Overall

This hospital has not adopted the most recent version of case costing for several reasons. (1) There has been no linking of funding to case costing. (2) Hospitals that ran deficits, and were not on case costing, have had their deficits underwritten by the province. However, hospitals using case costing that eliminated their deficits by way of good cost management were thereby penalised. This created a negative incentive for the continued implementation of case costing. (3) The most recent version of case costing is considered too detailed, vastly increasing the cost of data collection.

Case 2: VP, Finance; and Director, Decision Support Systems; medium size, non-teaching hospital, 1,500 employees

This hospital is a medium size, non-teaching hospital located in a major centre. This hospital has not adopted case costing and it was not one of the hospitals in the pilot project. It is currently considering case costing, depending on funding from the Ministry.

- Cost accuracy/cost drivers

The VP, Finance, said that 80 per cent of costs are caused by 40 per cent of cases. He indicated that average costing per weighted case was all that is required by the Ministry and all that they needed for their decision making. Therefore, they did not provide feedback with respect to case complexity, number of cases or case type. Only the Director, Decision Support, is involved in the case costing initiative and is an active proponent of it. More accurate cost information by patient, by physician, or for purposes of cost control and cost causation through case costing is not a priority. The VP indicated, for example, that the patient care protocols provide information on physician utilisation and therefore this is not required from case costing. They argued that the increased use of technology - MRI scans and the like - has not increased the share of indirect cost because these costs are traceable to patients. Therefore, there is not a need for more sophisticated costing in their opinion.

Their higher priority needs for incremental cost information are driven by policy, not cases. For example, the Ministry has implemented a province-wide infection control protocol for hospitals and money has been allocated to reduce wait times for certain procedures. These have important cost implications that are not necessarily related directly to case costing.

- Champions

The champion of case costing at this hospital is the Director, Decision Support, and his interest is driven as much by the availability of funding to standardise source documentation as by the desire to have case costs. Little interest was shown by senior management or physicians at the time of the inception of case costing. If they do implement case costing, they hope to have a case costing system that is fully integrated with the main accounting system.

- Problems encountered

The major problems encountered in the implementation of case costing will likely be adequate resources and lack of standardised care maps for the low volume activity CMGs. Standardised care maps provide the treatment protocols to be followed for particular illnesses. Medical records provide data for case costing - nursing hours, imaging records, drugs used, patient stay and so on. Medical records staff regard case costing as just another task to transfer information to another record.

- Overall

The VP, Finance, indicated that case costing provides no value. In 21 years, he had never seen a funding decision made using case costing. He gave a recent example where a procedure was transferred to his hospital and the funding formula used was case weight averaging in spite of the availability of case costs. In

addition, the formula provided $6,000 per procedure for non-teaching hospitals and $8,000 for teaching hospitals, in spite of identical care mapping for the procedure.

Case 3: Chief Operating Officer (COO), Cancer Care Facilities

The COO, Cancer Care Facilities, in two hospitals in Ontario was responsible for the coordination of departments of hospitals providing cancer diagnosis and treatment. These departments represented about 400 employees.

- Cost accuracy/cost drivers

The COO indicated that one of the hospitals providing cancer care had case costing. He considered those costs to be highly accurate. However, their usefulness is hampered by lack of benchmarks in a field with highly specialised treatment protocols. This reduces the benefits of case costing for measuring efficiency.

- Champions

The VPs, Finance, province-wide, in the various facilities were the primary individuals involved in the assessment. The cancer care facilities in Ontario did not do an assessment of case costing directly, but the important factors for case costing would have been physician costing (because of differences in treatment protocol), improved cost control and behavioural impact on physicians. Case costing is also very important for nursing mix decisions.

- Problems encountered

The cancer care departments are autonomous units and are not driven by efficiency – the reward system does not favour efficiency. The COO felt decisions concerning the establishment and funding of cancer care locations are driven by political considerations – both internal and in the larger political sphere – whereas case costing is essentially economic. The COO indicated that the major problems encountered in case costing implementation were lack of resources, lack of senior management support at Cancer Care Ontario, and variability in support from physicians. It is difficult to define standardised care maps, but where there were care maps he felt that 75 per cent of them were standardised. He indicated that the definition of activities is not a critical problem. The allocation of workload to activities is not a conceptual problem, but the lack of a workload data collection system is a barrier.

- Overall

There is a lack of conceptual understanding of case costing, and the value of case costing is not recognised by senior management at Cancer Care Ontario.

Case 4: CEO, Mental Health Facilities, 2,500 employees

Case costing was considered, but never formally assessed at this institution. The CEO indicated that case costs in mental health are driven more by degree of disability than by case type, making case costing difficult to implement. He indicated that there were two key disincentives to implementing case costing. Firstly, case costing was never tied to a funding formula with the province. Secondly, since external comparisons or benchmarks were never developed there was no ability to assess the efficiency of the operation on a relative basis, and there

was no leverage in making a case costing argument for funding based on relative productivity. The current trend is to justify funding proposals based on Resident Assessment Instrument Levels, which identify standards for care rather than case type, ranging from light to heavy. (Note that this does not rule out ABC costing, as the cost driver could certainly be the level of care index rather than case types.)

A summary of these findings can be found in **Table 1** below.

TABLE 1 SUMMARY OF CASE FINDINGS

Hospital Site	Case1	Case 2	Case 3	Case 4
Cost accuracy/drivers	* more accurate cost information for cost control, cost causation * addressed lack of control in hospital costing	*average costing per weighted case was all that Ministry required * patient care protocols provide information on physician utilisation * cost information needs driven by policy	* Usefulness hampered by lack of benchmarks in a highly specialised field – cancer care * differences in treatment protocols * behavioural impact on physicians * important for nursing mix decisions	* cost of mental health driven by degree of disability rather than by case type * case costing not linked to a funding formula * no external benchmarks
Champions	VP Finance	Director, Decision Support	VP Finance	None
Problems encountered	* lack of standardised care maps and medical records * coding of medical records highly subjective * no tie to funding	* lack of resources * lack of standardised care maps for low volume CMGs	* cancer care units are autonomous units * reward system does not favour efficiency * lack of resources * lack of senior management support * lack of a workload data collection system	N/A
Overall conclusion	Latest version not adopted	Not adopted (Adoption dependent on receipt of funds)	Not adopted	Not adopted

DISCUSSION AND CONCLUSIONS

We learned from the interviews in this small sample that case costing was not an integrated management tool at the hospitals. The case costs information was not used to assess the cost/benefit of procedures; it was not used for the day-to-day management of activity; and it was not used to defend or propose budget projections. With the increase in technology and the severe cost pressures on hospitals, one would expect, from the theory described earlier in the paper, that this is an ideal setting for voluntary ABC costing.

From our interviews, we tentatively conclude that the low adoption rate in the hospitals can be attributed to the following:

1. The overall hospital budget success or failure is driven primarily by the bargaining power of the senior management of the hospital and by political considerations. In addition, the hospital budget process is still rooted in the traditional incremental approach - spend it or lose it. Although the province has discussed and implemented funding models based on case loads, the application has been only at the margin.
2. The champions for case costing in Ontario hospitals were the VPs, Finance, of the pilot hospitals. They were unable to convince line staff of the benefits of case costing (such as a funding formula based on case costs), or those benefits were not forthcoming.
3. Doctors' compensation is on a fee for service basis paid directly by the Ministry of Health and is not tied to the hospital budget. Doctors are not directly involved in the management of the hospital's budget.
4. Other work by Lay (2003) shows that the accounting systems at most hospitals are not sophisticated enough to collect case cost information easily. The historical experience of the OCCP was that significant resources were required to bring the costing information to an acceptable level of accuracy.

Case costing (a form of ABC) has not been widely accepted in Ontario hospitals, in spite of the fit with the Cooper/Kaplan model, the support of the Ministry of Health and the apparent operational success of the OCCP. Our research suggests that the key reasons for lack of adoption are that: line managers perceive that case costing does not provide an effective funding formula; policy and political priorities drive resource allocation from governments; physicians' incentives are not tied to cost management; and case costing is perceived as just another administrative burden.

The limitations of the small sample in this study are recognised and generalisations from these results are tentative pending future work as indicated below. We plan further research in the following areas. First, the Ministry of Health in Ontario is considering the recommendations of the report of the Change Foundation (Murray et al., 2004) which proposes that the implementation of case costing in hospitals be

revisited. The authors plan to follow the progress of this possible implementation which will provide larger samples on rates of adoption in Ontario. Second, the authors plan further research of this type in other provinces in Canada. Third, the authors plan to continue collaborative work with their Irish colleague on comparative rates of adoption in Ireland and Canada using larger samples.

ACKNOWLEDGEMENTS

Financial support from CMA Canada is gratefully acknowledged.

NOTES

1 Ontario Case Cost Project.
2 The term "case costing " is used in this section as the term familiar to Ontario hospital personnel rather than ABC costing.
3 A passionate person who pushes hard for change or improvement (Drucker, 1998).

REFERENCES

Baptist, A. (1987). A General Approach to Costing in Ancillary Departments, *Topics in Health Care Financing,* Vol. 13, No. 4, pp. 32–47.

Bolster, C.J. and Binion, R. (1987). Linkages between Cost Management and Productivity. *Topics in Health Care Financing*, Vol. 13, No. 4, pp. 67–75.

Burik, D. and Duvall, T. (1985). Hospital Cost Accounting: Implementing the System Successfully, *Healthcare Financial Management*, Vol. 39, No. 5, pp. 76–88.

Clarke, P.J., Hill, N. and Stevens, K. (1999). Activity-Based Costing in Ireland: Barriers to and Opportunities for Change, *Critical Perspectives on Accounting*, Vol. 10, pp. 443–468.

Cooper, R. and Kaplan, R.S. (1992). Activity-Based Systems: Measuring the Costs of Resource Usage, *Accounting Horizons*, Vol. 6, No. 3, pp. 1–13.

Cooper, R. and Kaplan, R.S. (1999). *The Design of Cost Management Systems: Text and Cases,* (2nd ed.), Upper Saddle River, N.J.:Prentice Hall.

Doyle, G. (2000). The Emergence of Accounting Innovations: Care Setting, *Unpublished PhD Thesis.*

Drucker, P. (1998). *Adventures of a Bystander,* Hoboken, N.J.: John Wiley and Sons.

Eden, R., Maingot, M., Doyle, G. (2006). Case Studies of ABC Adoption in Hospitals: A Comparison across Canada and Ireland, *Working Paper 06–22,* University of Ottawa.

Fetter, R.B., Shin, Y., Freeman, J.L., Averill, R.F. and Thompson, J.D. (1980). Case Mix Definition by Diagnosis-Related Groups, *Supplement to Medical Care*, Vol. 18, No. 2, pp. 1–53.

Hayes, M.W. and Lay, C. (1983). Coping With Constraints: A Program Expense Model, *Dimensions*, Vol. 60, No. 7, pp. 30–34.

Hill, N. (2000). Adoption of Costing Systems in US hospitals: An Event History Analysis 1980–1990, *Journal of Accounting and Public Policy*, Vol. 19, pp. 41–47.

Hoyt, R.E. and Lay, C.M. (1995). Linking Cost Control Measures to Health Care Services by Using Activity-Based Information, *Health Services Management Research*, Vol. 8, No. 4, pp. 221–233.

Innes, J. and Mitchell, F. (1995). A Survey of Activity-Based Costing in the UK's Largest Companies, *Management Accounting Research,* Vol. 6, No. 2, pp. 137–153.

Innes, J. and Mitchell, F. (1997). The Application of Activity Based Costing in the United Kingdom's Largest Financial Institutions, *The Services Industries Journal,* Vol. 17, pp. 190–203.

Innes, J., Mitchell, F. and Sinclair, D. (2000). Activity Based Costing in the UK's Largest Companies: A Comparison of 1994 and 1999 Survey Results, *Management Accounting Research,* Vol. 11, No. 3, pp. 349–362.

Johnson, H.T. and Kaplan, R.S. (1987). *Relevance Lost: The Rise and Fall of Management Accounting,* Boston, MA: Harvard Business School Press.

Lay, C. (2003). Cost Variance Analysis in Canadian Hospitals, Presented at the Administrative Sciences Association of Canada, Halifax, 2003.

Murray, G., Hannam, R. and Wong, J. (2004). Case Costing in Ontario: What Makes for Success?, The Change Foundation, www.changefoundation.com

Nicholson, R. and Armitage, H. (1993). *Management Accounting Issues Paper 3,* The Society of Management Accountants of Canada.

Ontario Case Cost Project (OCCP) (1995). Ontario Guide to Case Costing.

Orloff, T., Little, C., Clune, C., Klingman, D. and Preston B. (1990). Hospital Cost Accounting: Who's doing what and why?, *Health Care Management Review* , Vol. 15, No. 4, pp. 73–78.

Ostrenga, M.R. (1990). Activities: The Focal Point of Total Cost Management, *Management Accounting,* Vol. 71, No. 8, pp. 42–49.

Pierce, B. and Brown, R. (2004). An Empirical Study of Activity-Based and Alternative Costing Systems in Ireland, *The Irish Accounting Review,* Vol. 11, No. 1, pp. 33–55.

Scapens, R.W. (1990). Researching Management Accounting Practice: The Role of Case Study Methods, *British Accounting Review,* Vol. 22, pp. 259–281.

Schimmel, V.E., Alley, C. and Heath, A.M. (1987). Measuring Costs: Product-Line Accounting Versus Ratio of Cost to Charges, *Topics in Healthcare Financing,* Vol. 13, No. 4, pp. 76–88.

Travis, J.F. (1987). Bottom Up Accounting Systems: A Superior Method for Controlling Healthcare Costs, *Modern Healthcare,* Vol. 17, No. 26.