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Developing Public Sector Cost Accounting Systems—Case Finnish Defence Forces*

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This paper addresses the relationship between “new” and the “old” public performance management; the dialogue between imported idealistic designs and the inherently stable existing (performance) management systems (Carmona & Grönlund, 2003; Hyvönen, Järvinen, Pellinen, & Rahko, 2009; Scapens & Ter Bogt, 2009). We see the co-existence of imported and traditional, both idealistic and realistic models of performance management as problematic. Such performance management models are based on different institutional logics that are the taken-for-granted rules guiding behavior of field-level actors, and related practices that predominate in an organizational field. These logics help to explain connections that create a sense of common purpose and unity within an organizational field (Scott, 2001; Kitchener, 2002). The purpose of this paper is to analyze and illustrate how institutional pressures for management accounting change are formed. Most studies on change and stability of management accounting pay little attention on how institutional pressures for accounting change are formed, especially on the political field level. Our study demonstrates how various actors at the political field level participate in creating institutional pressures in diverse and sometimes contradictory ways. Drawing on archival data and 20 interviews with public officials, we seek to illustrate how different organizational field-level actors’ views on implementing cost accounting differ, and how these views have influenced the outcome of cost accounting development in the Finnish Defence Forces. Our results suggest that contradictory institutional logics exist in relation with Finnish central government management-by-results, performance management and cost accounting systems. A value-for-money ideology in the armed forces sector (see e.g., Grönlund & Catasus, 2005) at times seems to challenge and even contradict the “legalistic” tradition of developing cost accounting that conforms to budgetary laws and statues. Similarly, the New Public Management based performance prism model (Fryer, Antony, & Ogden, 2009; Neely, Adams, & Crowe, 2001), when implemented at a local level, seems to conflict with notions common in accounting literature, according to which management accounting systems should be aligned with organizations’ strategy and structure (see e.g., Abernethy, Lillis, Brownell, & Carter, 2001).

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Introduction

Recent debate has evinced the notion that public sector performance management still remains an important topic for accounting researchers. While much of the debate has concerned New Public (Financial) Management, and the tensions and potential contradictions within such ideological developments (see e.g., Lapsley, 2008), a number of studies have addressed the relationship between the “new” and the “old” public management; the dialogue between imported idealistic designs and the inherently stable existing (performance) management systems (Carmona & Grönlund, 2003; Hyvönen, Järvinen, Pellinen, & Rahko, 2009; Scapens & Ter Bogt, 2009). In this spirit we set out to investigate the competition between value-for-money and traditional budgetary control ideologies in central government and how these influence, and are influenced by accounting and control systems.

Some previous studies suggested that in circumstances where institutional pressure is applied to change performance measurement and control systems, there is a likelihood that the systems will develop over time to serve mostly other purposes than rational decision making (Ansari & Euske, 1987; Siti-Nabiha & Scapens, 2005). This does not mean that economic rationality did not exist; it is just intertwined with legitimacy in a regulated environment, where legitimacy in the eyes of financiers may actually reap financial benefits (Carruthers, 1995; Modell, 2001; Järvinen, 2009; Hopper & Major, 2007). On the other hand, existing PMS and control systems seem to exhibit inherent stability and an ability to resist demands for change, however powerful those demands may be (Carmona & Macias, 2001; Granlund, 2001; Hyvönen & Järvinen, 2006; Lukka, 2007; Hyvönen et al., 2009). However, some institutional theorists have presented a different view according to which organizations are constantly facing demands for change, and that stability, not change, is a tenuous social accomplishment that requires constant recreation (Meyer & Rowan, 1977; Lounsbury, 2008).

The literature on management accounting change has seldom addressed extra-organizational political field issues in driving accounting change (Miller, 1994; Dillard, Rigsby, & Goodman, 2004). One starting point of our study is the belief that such pressures are seldom either stable or without internal contradiction. Instead, the very concept of political field implies that various ideas and ideologies are competing against each other, which will have a profound effect on the outcome of the institutional pressure applied in various organizations. Some earlier studies have addressed the issue of conflicting logic in management accounting change. For instance, Dent (1991) illustrated how emerging accounting logic was able to challenge the traditional engineering logic in British Rail, as change in organizational management provided an opportunity for the change in logic. Similarly, Järvinen (2009) illustrated how a shift managerial discourse in the health care sector from private sector idealization to public sector transparency was connected with a change in accounting control systems, while Major and Hopper (2005) addressed the conflicting logics between top management and production workers. Modell (2001) illustrated how public organizations facing diverse institutional pressures may exercise proactive choice when developing their performance measurement systems. Such actions may cause PMS to differ across organizations, and introduce elements of unplanned consequences in the process.

In this study we observe the pressure to reform accounting control systems in the Finnish Defence Forces by interviewing the key persons who define the policy on how Finnish central government controls its agencies. Even though central government seems to have a clear agenda on how accounting should be done, the issue of controlling the agencies seems to be somewhat contradictory. We draw on institutional theory, especially the
concept of institutional logics, to interpret our findings. The co-existence of imported and traditional, both idealistic and realistic models of performance management can be seen as problematic. They are based on different institutional logics that are the taken-for-granted rules guiding behavior of field-level actors, and related practices that predominate in an organizational field (Scott, 2001). Logics help to explain connections that create a sense of common purpose and unity within an organizational field. However, while sometimes a new institutional logic introduced to an organizational field becomes dominant and a driver for change (Kitchener, 2002); at other times the competing logics seem to have the capacity to coexist for a relatively long period of time (Reay & Hinings, 2009).

The purpose of this paper is to analyze and illustrate how institutional pressures evolve. The empirical setting of our study is The Government of Finland and the management-by-results system implemented throughout the entire government in 1995. We seek to illustrate how different organizational field level actors’ views on implementing cost accounting differ, and how these views have influenced the outcome of cost accounting development in the Finnish Defence Forces.

**Data, Method and Methodology**

A qualitative case study approach was selected as appropriate for the primary goal of developing theoretical and empirical understandings of the institutionalized patterns in the central government context (see Greenwood & Hinings, 1996). The application of the performance prism model in a context where management-by-results has traditionally been viewed as a “semi-legal” agreement between central government and its agencies was “sampled in a purposeful way” (Miles & Huberman, 1994) to provide a theoretically informed case, where competing institutional logics would most likely be encountered (Yin, 1994).

The primary data of this study consists of 20 taped and transcribed interviews with public officials at the Parliamentary Auditing Committee, the National Audit Office, the Ministry of Finance, the State Treasury, the Ministry of Defence and the Defence Staff. The interviews were conducted between 2004 and 2010. In addition, our analysis draws on various legal documents, the National Audit Office’s reports and the Ministry of Finance’s archival documents concerning management-by-results, performance management and cost accounting systems.

![Figure 1. Finnish Defence Forces (FDF) in relation to the controlling central government agencies.](image)

Figure 1 illustrates the control relationships between the governmental agencies where we conducted our interviews. A bold line signifies a direct control relationship while a dotted line signifies an accountability arrangement through the management-by-results system. In the Defence Staff we interviewed seven persons...
who were implementing a new cost accounting system for the purposes of Management By Result (MBR) reporting during the period 2004-2006. At the same time, we analyzed all the reports issued by the National Audit Office on the Defence Forces starting from 1994. After this (in 2006 and again in 2009), we interviewed the director of the National Audit Office¹, as well as two National Audit Office auditors who were responsible for the Defence Forces performance reviews. In addition to the directors of the government agencies reviewed, the National Audit Office reports to the parliamentary Audit Committee², where in 2009 we interviewed two of its senior members. At approximately the same time we interviewed two senior civil servants of the Ministry of Finance, plus the director of the State Treasury³, who is responsible for the development of management and cost accounting in central government.

Our intention in the interviews was to start out from the organizational level (where our case organization was the Finnish Defence Forces, FDF) and to proceed to the political level to investigate how the pressure to reform management and cost accounting in the FDF was formed. At all interviews, at least two members of our group were present. The interviews were all transcribed verbatim, which allowed other members of the group to form their opinion on the events. After reading the transcriptions, we met to discuss and form a collective opinion and a narrative of the significant events. Finally, we used the new institutional theory framework to interpret and theorize our findings.

New institutional theory defines institutions as “historical accretions of past practices and understandings that set conditions on action” (Barley & Tolbert, 1997). Organizational forms and practices are institutionalized when they are adopted because actors take them for granted, rather than because a rational choice process found them to be most appropriate for the technical requirements for the task. In empirical work, institutionalization is typically operationalized by prevalence within a given population rather than by direct assessment of “taken-for-grantedness”. Thus, widespread adoption of organizational practices may be seen as a sign of institutionalization in itself. However, given its emphasis on conformity, institutional theory is often seen to struggle to explain non-isomorphic change and neglect the role of political processes (Fliegstein, 1996).

However, such legitimate and/or taken-for-granted actions must be continuously recreated and reproduced in order to maintain institutions (Burns & Scapens, 2000; Lawrence & Suddaby, 2006). This is not to deny the possibility (or even likelihood) of stability of management accounting and control systems (Granlund, 2001), rather it allows conceptual space to assess the processes through which stability and change are negotiated (Delbridge & Edwards, 2007). Importantly, the continuous recreation and reproduction of institutionalized patterns may imply that several competing institutional logics (Friedland & Alford, 1991) are likely to exist at any given moment. Thornton (2004) defined institutional logic as “the socially constructed, historical pattern of material practices, assumptions, values, beliefs, and rules by which individuals produce and reproduce their material subsistence, organize time and space, and produce meaning to their social reality”. Thus the concept of institutional logic refers to the broader cultural beliefs and rules that structure cognition, (i.e., how key

¹ The National Audit Office reports directly to Parliament. It audits the state’s finances and asset management in order to ensure that public funds are spent wisely and in compliance with legislation.
² The Audit Committee is one of the standing parliamentary committees. Its main tasks include the control of government’s accounts and budgetary spending. One key task of the Audit Committee is to ensure that Parliament’s decisions concerning governmental finances are acted upon in governmental agencies.
³ The State Treasury operates under the Ministry of Finance, and its tasks include arranging a wide range of financial services for governmental agencies, keeping government’s central accounts, and administering government’s pension schemes as well as other insurance issues.
decision-makers tend to focus on only a few issues and a limited number of possible solutions, which has a profound effect on the decision-making process and its outcomes) (Ocasio, 1997).

Importantly, the concept of institutional logics will offer potential explanations for different organizational practices that persist over time. Recent research has identified situations where competing institutional logics have the capacity to continue to co-exist for a lengthy period of time. For instance, Kitchener (2002) and Reay and Hinings (2009) have investigated the conflicting institutional logics of managerialism and professionalism and identified various mechanisms that allow actors to manage the rivalry between the institutional logics.

Management-by-Results: Finnish Central Government and the Defence Forces

MBR and the Performance Prism Model

Earlier the control in public sector management was strictly based on the legislation and other norms, but in the MBR system the control of government agencies is based on target setting. The shift from ex-ante orientated control to ex post orientated control took place gradually between 1995 and 2003, when the MBR system was introduced and developed for Finnish central government in various fields of administration. In 2002 there were two different committees or working groups whose task was to develop operational and financial reporting in the Finnish national government. The Speakers’ Council of Parliament established a committee to develop reporting procedures concerning the economy of the national government. The other working group was set up by the Ministry of Finance with the task of developing financial reporting, accountability and responsibility for performances in the national government. Based on the work of these two committees, operational and financial reporting in the national government was developed in 2003, and reforms were implemented in legislation and practice in 2004. Reforms took place both on government level as a whole and on the individual agency level. The steering role of the Ministry strengthened in issues concerning evaluation and reporting on operations and finances of the agencies. The financial report was developed at government level as a whole.

Today, the MBR model of Finnish central government is an agreement-based interactive steering and control model. Its operational core is in the ability of the agreement parties to find the appropriate balance between the available resources and the results to be attained with them (Handbook on Performance Management 2/2006). The interaction between two parties takes place, for example, between the Ministry of Defence and the FDF. The basic aim of the MBR reform was to improve the efficiency, and actors’ opportunities to achieve the goals by giving more operational freedom, and to improve accountability. The latter also meant new reporting requirements, where government agencies were obligated to report on the achievement of targets. According to some writers, the shift in MBR methods was also ideological—the basic idea of the MBR reform was that the public sector management was obligated to produce more value for taxpayers’ money (Meklin & Näsi, 1994).

The MBR model has not, however, remained unchanged. One and the latest of these innovations is the so-called performance prism (PP) model (Fryer, Antony, & Ogden, 2009; Neely, Adams, & Crowe, 2001) adopted in 2004 to be the core of the MBR model in central government in Finland. In 2004, by executing the budget legislation reform and launching the prism model, the Ministry of Finance aimed to provide a common framework for the MBR system. The purpose of the reform, according to the Ministry of Finance (Handbook on Performance Management 2/2006) was “to enhance performance management and accountability in the administration significantly”. According to the Ministry, better performance management and accountability
requires “reform of government annual accounts reporting and accountability procedures as well as rigorous development of accounting functions and management practices”. Furthermore, “proper performance management includes the ministries ensuring that proper performance targets are set (also regarding their own operations) and the agencies presenting true and fair information on their operations in their annual accounts”.

In the budget legislation provisions, the basic criteria for performance was redefined and required to be applied throughout the whole of Finnish central government, in all administrative sectors. The core concepts of performance made a distinction between policy effectiveness, operational efficiency, outputs and quality management, and the management of human and financial resources. Policy effectiveness (outcome targets) applies to broader benefits or social impacts (such as promoting gender equality, or reducing infant mortality). The policy effectiveness reflects how certain operations generate greater public good.

In the PP model, the content of control has been diversified, and a clear distinction has been made between strategic outcome targets and operational performance targets. To attain and report on the social impacts and outcome targets (policy effectiveness) were emphasized as being the responsibility of the ministries, while both the ministries and agencies under their control were responsible for attaining and reporting the operational performance targets. As pointed out, the output targets should be connected with operations and resources as closely as possible, whereby their attainment depends directly on what the agency does and how it is managed (Handbook on Performance Management 2/2006).

The output targets—representing operational performance—are such that the government agency itself can influence them. The targets, when set in an ideal way, are concrete and operational such that they cover as large a part of the operations as possible. According to the Ministry of Finance, the output targets should be set primarily as indicators and only secondarily as verbal targets. They should be derived from a government agency’s strategy and to be essential from the point of view of its operations. They should be clear and comprehensible to everybody, evaluable, measurable and time-dependent. The output targets should also be ambitious and challenging, but at the same time attainable and realistic. They should also be acceptable, jointly outlined and agreed (Handbook on Performance Management 2/2006).

Basic performance criteria

![Figure 2: The Performance Prism (PP) model.](image-url)
All in all, the PP model (See Figure 2) represents a new definition of MBR-related performance management system in Finland. The Ministry of Finance puts stress on the importance of creating a link between controlling on the one hand and decision-making, monitoring and evaluation on the other. By developing the PP model, the intention of the Ministry of Finance has been “to make the contents of control more strategic”, to create a close link between targets and the allocation of resources, and to gain “true and fair information in the result reporting”. The ministries responsibility for the strategic control of their operational branches was stressed (Handbook on Performance Management 2/2006).

Implementing MBR in the FDF

The military was the first agency to implement MBR in the Finnish central government context. Officially, the military’s MBR implementation began when the Ministry of Defence made the decision to implement a new accounting system with the related MBR management project. This administrative reform was based on the guidelines drafted for the central government’s MBR model.

Before the MBR reform, the majority of units in the FDF had not used any management accounting tools whatsoever. As MBR progressed, performance measurement systems were introduced. This involved decentralizing many accounting functions and renewing the budgeting system with the intention of making budgetary accounting and follow-ups easier. At this stage, the FDF aimed at creating such accounting control systems that would provide information on productivity, efficiency and performance as well as revenues and costs by a business area. In order to promote cost consciousness the accounting system should allocate costs both to outputs and activities/responsibility areas. This implied that the accounting systems had to be technically developed.

The Defence Staff’s Planning Unit became responsible for drafting targets for the development of management accounting. The idea was to set only rough guidelines for individual organizational units, as the idea of MBR also included a certain degree of decentralization—the individual units were free to set their targets, but also had to be able to justify them. All in all, most organizational units were given significant freedom in doing this, as long as the information was made available. It was deemed important that various local information systems employed in various organizational units would be compatible with each other in the future. Specific attention was paid to defining outputs that would describe the units’ key activities, and could thus be subject to cost calculations. At first, many of the performance measures were financial, and intended to give feedback to the units in case (e.g., of budget lapse). Different sectors in the FDF were obliged to finish this process so that it was possible to start extensive reporting of performance measures as well as outputs and their costs at the beginning of 1994. Some units had started this process earlier, and produced reports on performance measures and analyzes concerning the causes of the measures. For instance, some units of the Navy and Air Force had their own reporting systems that covered (e.g., the extent to which territorial waters were patrolled, what extraordinary events or disturbances had occurred, and what measures had been taken in such circumstances). Regarding cost accounting calculations, the cost of one hour of operating a military aircraft and the cost of training conscripted military for one day were calculated and presented in the first MBR contract negotiations.

As MBR was being implemented, the National Audit Office repeatedly called for an improvement in cost accounting and reporting throughout the Defence Forces. In fact, these critical comments were raised in virtually every National Audit Office report between 1996 and 2005—to almost no effect at all. Then,
beginning from 2004, the performance prism model became the dominant tool for conceptualizing the MBR system and the demands over providing accurate cost information seemed to somewhat wane. However, even though cost accounting lagged behind, the number accounting reforms the FDF began to plan and implement were numerous. Internal transactions and transfer prices were followed in much greater detail. The list of the FDF’s assets was replaced with a balance sheet, which also included ordnance, and depreciations were calculated. Income statements and balance sheets were to be calculated at a subunit level. The plans also included the development of cost accounting and internal allocation systems, but these were never implemented in practice. It seems that the organizational actors were able to make proactive decisions pertaining to what aspects of MBR related performance measures were put to use (Modell, 2001; Hyvönen et al., 2009). While the National Audit Office complained, the Ministry of Defence seemed to be satisfied. A senior official of the Ministry of Finance commented:

The ministries were not able to act in the way they planned, and what was expected from them. One could say that the ministries were lax. They were... excessively liberal... […]... They were satisfied with any level of effort. The outcome was that we implemented these changes in budgetary acts and statutes that we call the sharpened management-by-results. It’s a like a verbal joke, the sharpened MBR. What it meant in practice was that these demands for reporting, they were written down in laws, especially concerning the ministry level. There were some demands directed at agencies that provide results, but mostly the directives were aimed at ministries that demand the results. And then there were some changes in content, in ideology. We separated the policy effectiveness and the operational results from each other, at a written norm level. We made the famous performance prism for marketing our thoughts.

Thus, with the “sharpening of MBR” the pendulum of governmental control policy over agencies swung back from the liberalism of devolved budgets to writing down the control system requirements in the law. However, we argue that regarding the control policies, the Finnish central government was not a united actor with homogeneous goals. Instead, we saw two traditions of administrative thinking at work; the traditional thinking where the central government controls its agencies through the legal framework and stressing societal outcomes, and the more recently emerging approach, where agencies are controlled outside the legal framework by setting quantifiable goals and stressing the cost/benefit issue of control. We interpret these as competing institutional logics (Reay & Hinings, 2009) and name them “legalistic logic” and the “value-for-money” logic. The performance prism-model emerged as a result of one conflict between these logics. However, enough ambiguity and contradictory messages concerning central government aims survived to allow the FDF to choose which accounting and control systems to implement.

The Two Institutional Logics

Legalistic Logic within the MBR Framework

The Finnish central government system is of Nordic origin and often referred to as sector government. In short, this means a system where sector ministries (e.g., education, defense, etc.) are rather independent of each other, each led by a chancellor (civil servant) and an appointed minister of the cabinet. Under each sector ministry there exist several governmental agencies. For example, organization of the defense branch consists of the minister of defense at the political level, the ministry of defense at the central government level, and the Finnish Defence Forces as its most important government agency.

Traditionally, each government sector was given its budget, which was then broken down into government agency budgets on a line-item basis. In order to control spending, transfers of funds between the items were discouraged. For example,
In the old times we had a line item for pencils, and a line item for paper. If we ran out of pencils, we had to apply for Parliament to grant us permission to transfer funds from the paper line item in order to purchase new pencils (Senior official, Ministry of Finance).

Budgetary accounting at the central government level is cash based. Accruals-based accounting was adopted in central government agencies in 1997, which meant that an income statement would be prepared. Constructing a balance sheet is in most agencies a technical reporting matter rather than an accountability arrangement, as agencies are not separate legal entities and therefore their debt and equity are those of central government. As the government agency’s funds flow from the central government treasury, the only accrual-based income comes from services sold outside the government. This makes the income statement look quite peculiar, and was thought by the interviewees to limit its use for accountability and control purposes:

We could have a budget that has our income less expenses, income would be all the funds allocated to us, and then you would deduct expenses and the difference is zero. But our budget consists of these expenses (sales to outside) less all our expenses, and the end result is always negative … […] and here we have it, two billion, two and a half billion Euros in the red. (Project manager, Lt. Col., Defence Staff)

Despite various accountability and control system reforms such as accruals based accounting, contracting mechanisms and the performance prism model, the monitoring of resources spent has remained the core of all financial reporting. Our interviewee continued:

Our main reporting issue is how much we have spent in each activity, in a particular organization unit, and from what budgetary account, they were previously called line items, the money came from. (Project manager, Lt. Col., Defence Staff)

Control in central government seems to be focused on using of budgeted funds. Other controls exist, but are significantly weaker, and may in some instances contradict the traditional legalistic framework. For instance, performance measurement may be decoupled from increases/decreases in the agency’s funding, and the contracting mechanism may not in all cases be binding. Regarding the latter point, one interviewee commented:

The National Audit Office has complained that the Ministry of Finance cannot effectively control many issues, let’s take IT as an example. We cannot force other governmental sectors to implement anything. What we do is contracting between agencies, because the National Audit Office happened to say that let’s make the contracts. And then the sector agencies agree let’s have the shared service centre to take care of IT. And this is without thinking of the legal side of the issue like… a contract [between two agencies] within the central government is not like legally binding. So we think whether the government should write something in the statutes about this. So this is the way central government can have management control. (Controller, Ministry of Finance)

Value-for-Money Logic

On a broad scale the value-for-money logic seems to be linked to decentralization of government budgets and the resulting abandoning of line-item based resource control. As the government agencies became accountable for their own budgets, the taxpayers were seen to have the right to know what outputs, services or “value” they got for their money. This was especially the case when the resource consumption of a government agency increased. At the same time, the legalistic framework that bound resource consumption sometimes at a minute level had to be at least partially dismantled.

A fundamental change took place that was at the beginning of the 90’s, I was involved in the background work, so we concluded that this was going to be managerialistic thinking. We would not draft any laws about this. This is not about laws. This is an alternative way to control public service production. Laws are being revoked. We do not write new ones. We revoke laws and do not write new ones. (Senior official, Ministry of Finance)

In relation to performance measurement, the key implication of value-for-money ideology in central
government is that mere controlling and reporting of budgetary spending is not enough to establish accountability and control. Instead, the costs should be linked to various performance measures concerning quality and measurable output of public services. Budgets were devolved very much the same way as in the British devolved government project (see e.g., Collier, 2001). As budgetary control was reduced, new the MBR system that replaced it required that new performance management systems be introduced. Relating to this, one interviewee emphasized the need to monitor quality of services in addition to quantity and costs.

In the central government, quality is about rule of law and customer satisfaction. Rule of law, that somebody is holding it up. That includes many controls. Then customer satisfaction, we either improve it or diminish it. So these are the basic components of quality. Measuring of customer satisfaction, in those functions where it makes sense, is quite widely adopted... [...] our agencies have realized that it must have resources. (Senior official, Ministry of Finance)

In addition to performance measurement, accounting in general was seen as an increasingly important feature of the MBR system. This was especially the case with the ministry level—the ones who demand results. However, the problem of motivating the agencies remained, which was stressed by many interviewees. (e.g., the director of the National Audit Office):

The critical feature in the management-by-results system is the state of accounting, and it must be improved... but the impression is that we have not had efficient incentives for that. (Director, National Audit Office)

The unwillingness of many government agencies, especially the FDF, to implement adequate accounting systems had been the driver for the 2003 tightening of norms regarding the MBR system, which had been labeled “sharpening MBR”. Originally it included the idea that all government agencies should develop a uniform costing system (according to activity-based costing principles). This idea soon had to be abandoned.

Already in 2005 the idea of a uniform costing system was abandoned, so it’s enough to have a simpler system, if we can just call it management accounting in some way, when it provides the information we need to assess the agency’s performance. That was a sort of loosening of the regulations. (Director, National Audit Office)

While the idea of uniform cost accounting/activity-based costing system across the central government was abandoned, the law defining the MBR system still contained the idea of cost accounting as a central tool for the MBR. The interviewees whom we interpret as proponents of the value-for-money logic criticized this heavily, arguing that bordered on the absurd to have binding law/statute level guidelines on (e.g., how to implement management and cost accounting systems). For instance, one interviewee stated:

We have been thinking about what should be included in that law, and our opinion is to remove such items, I mean if it is illegal for someone not to do cost accounting the way somebody else tells him to ... this situation is just preposterous ...[...]... no one in there (National Audit Office) really understands cost accounting. It is like they have no conception of the reality. They don’t understand what is possible and what is no. (Controller, Ministry of Finance)

Contradictory Logics and Management Accounting Development in the FDF

While in times of peace the Defence Forces is in effect, a training and educative organization, its main “output” was seen by the interviewees to be the ability to defend the nation’s territory by arms in times of war. Unsurprisingly, most interviewees thought that performance measures, numerous as they may be would not capture this ultimate mission of the FDF.

Performance measures that are reported up here (to the Defence Staff) number about four and a half hundred. But how do we lead an organization with them? In sharpening the management by results there was this phrase ‘accurate and sufficient information’—it was well said. And it means that different organizational levels must have such information so that they can run the organization ... [...] ... here in the Defence Forces we think that, in terms of our desired outcome, the most important thing is that we have the ability to defend Finland. (Commodore, Defence Staff Quality Manager)
In fact, Catásus and Grönlund (2005) viewed performance measurements for welfare concepts (such as national security) as problematic since the measures indicate the quantity of services the public sector provides and how much they cost. This way, performance measurement practices limit the extent of services and keep people away from them. Another criticism leveled by the interviewees at the value-for-money framework in the military context was that in order to function properly, the performance measurement would in practice imply output quantification. National defense, however, is a pure public good.

(MBR system) is an ideal model … […]… and then we have sectors where such ideal models cannot be implemented in any way, for instance if there is a collective output, and then what if the output is actually about being prepared for something, and then there are all kinds of issues relating to (military) secrets … […] … war-time performance is, so to speak, an imaginary thing. (Official, Ministry of Finance controlling department)

While the FDF was able to resist pressures to develop new cost accounting systems, much criticism was leveled at its accounting function. This criticism came from both sides. Those interviewees identifying themselves with the legalistic tradition would criticize accounting personnel for not being able to implement the cost accounting systems required by the MBR system, while those interviewees identifying with value-for-money ideas saw the accounting function as obsolete, concentrating on trivial issues instead of the big picture of governmental agency finances.

Some of these people who have the title CFO are actually more like chief bookkeepers, and they have such a difficult time in getting rid of that role to become CFO’s. And to understand it really, that they should no longer be thinking can we record this transaction to that account, or is this invoice acceptable. (Controller, Ministry of Finance)

The requirements for the accounting and finance function were seen especially to be problematic in the FDF, where many accounting tasks are in fact carried out by military personnel (Hyvönen et al., 2009). In such an environment the increasing role of value-for-money logic will most likely influence occupational roles and identities and therefore “frame” the arena where output measurement and quantification are either accepted or criticized. In fact, earlier studies have illustrated how the changing of managerial agendas and discourses have shaped accountants’ occupational identities, and where conflict between identities and discourses occurs, give some accounting methods more appeal than others (Skaærbæk & Thorbjørnsen, 2007; Järvinen, 2009). Such processes may at least partially explain the rationale behind the FDF’s avoidance strategy in setting up management accounting systems. A senior official of the Ministry of Finance expressed his frustration over this:

I am more than a little bit annoyed that so few agencies have made any real efforts to develop a cost accounting system based on business accounting…[…]… In my mind this has been the greatest grief in this development process during the 1990’s, during the 2000’s. That business accounting never had the role that we had hoped it would have. What we thought in the 1990’s it would become. (Senior official, Ministry of Finance)

Conclusions

The purpose of this paper was to analyze how the competing institutional logics that we named legalistic logic and the value-for-money logic influenced the adoption and use of performance management and especially cost accounting as a part of management control in Finnish central government. Here, institutional logics are the broad cultural beliefs that shape our cognition and produce meaning to our social reality, but which must be continuously recreated to maintain them (Thornton & Ocasio, 2004).

A value-for-money ideology in the armed forces sector (see e.g., Grönlund & Catasus, 2005) seems at times to challenge and even contradict with “legalistic” tradition of developing cost accounting that conforms with budgetary laws and statues. Similarly, the New Public Management based performance prism model
(Fryer et al., 2009; Neely et al., 2001) seems, when implemented at a local level, to conflict with the notions common in accounting literature, according to which management accounting systems should be aligned with organizations strategy and structure (see e.g., Abernethy, Lillis, Brownell, & Carter, 2001).

The Parliamentary Audit Committee, which is the supreme agency concerned with the management control of governmental agencies, seemed not to be interested in accounting matters, as the officials interviewed saw accounting as irrelevant from the viewpoint of society as a whole. Thus, management-by-results accounting aspects, lump-sum budgets, performance measurement and cost accounting are operative matters and not a concern for the political or strategic decision-making process. However, the outcome of this seemingly clear and justifiable stance illustrates the strength of the traditional legalistic logic in central government. At first, the situation may seem paradoxical, as the top controlling agency distances itself from operative controls, stating only a need to control the relation of quantifiable outputs to performance. Meanwhile, a government agency such as the FDF, is able to slow down the development of accounting controls, since there is no law, and is able to obtain sufficient resources anyway. It seems that in the absence of norms, organizational actors were at least partially able to proactively choose which aspects of the MBR related performance measurement system they would implement (Modell, 2001; Hyvönen et al., 2009), and, paradoxically, this would also to some extent hinder the value-for-money–based ideas, too.

Recognizing the existence of two distinct institutional logics allows for sensemaking in such circumstances (Reay & Hinings, 2009). The situation also seems to promote heated debates in the MBR implementation process regarding who has the right to determine the guiding principles of management control over governmental agencies. The parties in such debates are not, however, divided along organizational lines. Instead, in both the Ministry of Finance and in the National Audit Office, proponents of both logics can be found. Naturally, a greater shift in institutional logic becomes possible when the top ranks of the civil service change. Importantly, both logics coexist. Frame budgets and detailed control of spending still exists, even though PMS systems have been set up in accordance with the MBR process and the performance prism model. Performance measurement is seen as a functioning solution for the training aspect of FDF, but incomplete as regards the armed defense capability, which is seen as the military’s main mission. Cost accounting is so far detached from the latter aspect that its development has been altogether halted, despite demands from the National Audit Office. In such circumstances management and cost accounting cannot be viewed just as an instrument of the new value-for-money logic. Rather, the development of management accounting systems is a necessary requirement for maintaining and recreating the value-for-money logic. Here, we contribute to the existing literature in two ways. First, by illustrating how competing institutional logics offer explanations for why the practice of performance measurement and control is heterogeneous and often paradoxical in the central government context, and is likely to remain so. Secondly, we have demonstrated the role of accounting control systems in the recreation of institutional logics, in this case what we have labeled the value-for-money-logic.

All in all, our study has addressed the importance of institutional logics that exist on the political field level (Dillard et al., 2004; Hopper & Major, 2007) and illustrated how these have the potential to influence organizational level developments in management accounting. We have interviewed the civil service members of the Parliamentary Audit Committee as well as several other government agencies in addition to the FDF, who participated in formulating the accounting-related agenda of the MBR process. The existence of competing institutional logics creates a situation where it will be difficult to implement changes (Hyvönen et al., 2009). This also has potential for creating a situation where managerial discourses become diverse, and appear
confusing to the organizational actors. Such circumstances may also shape accountants’ occupational identities, and where conflict between identities and discourses occurs, give some accounting methods more appeal than others (Skaærbæk & Thorbjørnsen, 2007; Järvinen, 2009). In addition, the lack of interest in the issue of government agency management control at highest level leaves the field open for a competition between the two logics, among the government agencies and their top civil servants.

References


An Increasing Rift Between Tax and Book Income After the Introduction of IFRS in Portugal

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From January 1, 2010 the Portuguese system of financial accounting and reporting is based on the International Financial Reporting Standards (IFRS). In Portugal, the taxable income of companies is derived from the accounting profit/loss. Adjustments are made to this figure to compute the taxable income. In this paper I will highlight the accounting and tax treatment of impairment losses in tangible assets, provisions, and the fair value method, concluding that the gap between accounting and tax rules did not diminish with the new system. In every one of the mentioned topics the rules inserted in the corporate tax code are quite different from the IFRS based accounting statements. Thus, an opportunity was lost to move towards a more harmonized system of computing book and tax income as far as corporate income tax is concerned.

Keywords: book-tax harmonization, IFRS and taxable income, corporate tax base

Introduction

Taxes influence the investment, financing and dividend decisions of companies (Scholes & Wolfson, 1991; Damodaran, 2001; Martins, Cruz, Augusto, Silva, & Gama, 2009). One of the main factors that impact taxable profits and the tax burden of companies is the way that corporate income taxation is more or less conformed to the accounting rules. That is, if corporate taxable revenue is subject to a set of rules–usually established in the corporate income tax code (CITC)–that are quite different from accounting standards, then corporate decision makers have a greater incentive to include the tax advantages/disadvantages in computing rates of return from certain assets (Slemrod & Bakija, 2004; Sanches, 2006).

Usually, the CIT is, in many countries, very detailed about the accounting expenses that can also be deductible for tax purposes. Tax legislators fear that if deductible expenses are not strictly detailed, taxpayers can inflate them to manipulate taxes due.

Many authors have been discussing a progressive divergence between financial and taxable income (Desai, 2003; Jones, 2006). Researchers in this area argue that the costs of complexity would justify a progressive harmonization of accounting and tax rules (Hanlon & Maydew, 2009; Lopes, 2008).

However, in many countries (including Portugal) the course that has been followed is, in my view, at best not a trend for harmonization and, more probably, an increasing rift between tax and accounting rules.

From January 1, 2010 the Portuguese system of financial accounting and reporting is based on the International Financial Reporting Standards (IFRS). Although from 2005 firms listed in the Portuguese stock
market had to adopt this system, as only a few dozen companies are listed in the Lisbon Stock Exchange, 400,000 firms subject to financial reporting 2010 marked a watershed.

The new IFRS based system has significant differences from the old one. Some of the most highlighted divergences are the very extended the use of fair value to recognize gains or loses in several balance sheet items, and the impairment tests that several asset classes are subjected to. But other aspects such as new types of provisions, rules for revenue recognition or the newly denominated biological assets and its valuation are also relevant departures from the old system.

In Portugal, the taxable income of companies is based on the accounting profit/loss. Adjustments are then made to this figure to arrive at the taxable income. Thus, given such important changes in the computation of accounting profit/loss (which will be, from now on, influenced by impairment loses, reversions, new provisions, new depreciation schedules, revaluations, the gains and losses derived from fair value changes, etc.) what was the reaction of the tax legislators? Did they accommodate in the computation of taxable revenue the main changes in the accounting side? Or did they move towards an even greater separation of accounting and tax rules?

The first purpose of this paper is to analyze the tax influence of the introduction of an IFRS based system in Portugal focusing on three relevant areas. Firstly, the tax treatment of impairment charges in tangible fixed assets will be highlighted. Then, a tax analysis of provisions will be presented. Also, the impact of fair value in the computation of some assets and its tax consequences will be stressed. Finally, the study will draw some conclusions about the (growing) gap between financial and taxable income in Portugal.

Impairment Charges in Tangible Assets

Introduction

An asset is said to be impaired if its recoverable value is less than its book value. The recoverable value is the higher between the fair value (less the costs related to the asset’s sale) and the use value. When an asset, by itself, has no cash generating power, then, as it is well known, impairment tests must be applied to groups of assets which are designated by “cash generating units” (CGU).

As far as the accounting side is concerned, some important questions arise regarding impairment tests:

How to aggregate assets in CGU?
How to compute the use value, when no market value exists as a proxy for the fair value?

On the corporate tax side, a crucial issue that legislators have to deal with is related to the nature of the impairment charges themselves. If, as usually, they are treated as costs for financial reporting purposes, the net revenue calculated by the accounting system is reduced. But given that they are estimates of loss of value in assets, tax authorities fear that an automatic acceptance of these losses for tax purposes could undermine taxable profits.

1 In this section the analysis of impairment charges will be restricted to tangible fixed assets. As it is well known, I chose this type of assets because in others such as inventory, receivables, the accounting and tax procedures do not significantly depart from the previous rules.
2 As defined in the Accounting Standard No. 12 (NCRF 12), fair value is “the amount for which an asset–or a cash flow unit–can be sold in a transaction between equally informed and non related parties, less the costs of selling”.
3 The use value is defined by the same Standard No. 12 as “the present value of the cash flows that are expected for the continuous utilization of an asset during its useful life plus its residual value”.
Some Issues on the Accounting for Impairment Losses

Turning to the questions mentioned above, it must be said that the problem of aggregation assets in CGU is a very complex one. To illustrate the potential complexities of this aggregation, let us imagine a bike factory which produces two types of bikes—A and B—in two production lines.

Even if one assumes, for the sake of simplicity, that the cutting, wielding and painting machines are different in both lines, some equipment (for example the quality control tools) can be shared by both lines. If each of the two lines are considered a CGU, then how to apportion the assets forming the quality system to each of the CGU?

Even if this problem is solved (e.g., on a pro rata basis) and still related to the example given, how to impute the salespeople cars or laptops to each CGU? Or how to impute all the administrative equipment used in offices to each CGU?

Recognizing these complex problems, many firms use the whole company as a CGU, therefore evading the question of imputing assets to several CGU.

Even in very large firms, as the next transcription of Bayer financial report for 2003 shows, CGU are formed by aggregating a very large number of assets. In this case, the “strategic business entities” were the central concept in testing for impairment. Thus, the financial reports of companies and the included notes to the financial statements, can be used to exemplify how, in practice, the complex problem of aggregating assets in CGU is solved.

Assets were tested for impairment by comparing the residual carrying amount of each cash generating unit (CGU) to the recoverable amount, which is the higher of the net selling price or value in use. In line with the definition of cash generating units, those of the Bayer Group were identified as being the strategic business entities, since there is the next financial reporting level below the segments.

In fiscal 2003, impairment tests were performed for the Polyurethanes, Coatings, Fibers; Plastics, Rubber; Chemicals; and Pharmaceuticals, Biological Products segments and their strategic business entities, which are shown in Table 1.

Table 1

<table>
<thead>
<tr>
<th>Segment</th>
<th>Strategic business entities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polyurethanes, coatings, fibers</td>
<td>Polyether, Fibers, Polyester, TPU, Films</td>
</tr>
<tr>
<td>Plastics, rubber</td>
<td>Styrenics, Rubber Chemicals, BR/Butyl, Technical Rubber products</td>
</tr>
<tr>
<td>Chemicals</td>
<td>Textile Processing Chemicals, Paper, Fine Chemicals, Inorganic Pigments</td>
</tr>
<tr>
<td>Pharmaceuticals, biological products</td>
<td>Plasma</td>
</tr>
</tbody>
</table>

The second question rose before about how to compute the use value of an asset (or a CGU) is plagued by the well known difficulties of forecasting cash flows and computing the appropriate cost of capital.

Every finance book\(^4\) treats these questions profusely, and every professional that has to apply them knows that little changes in assumptions (e.g., sales growth, operating margins, working capital requirements, risk premia or the growth rate in perpetuity) produces big variations in the value of the firms, lines of businesses or

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\(^4\) See Damodaran (2001); Bodie & Merton (2000).
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individual assets.

Regarding, for example, the problem of risk premia to be used in the computation of the equity cost of capital, Damodaran (2008) claimed that the different ways of estimating risk premia and the results from empirical studies support a wide range of values. According to the same author, one could justify, depending on different assumptions, 3% or 12%!

This author uses the past evolution of risk premia in the US (see Table 2) to illustrate how difficult it can be to choose among several numbers, depending on the method used in the computation of historical premia.

Table 2
The Historical Risk Premia in USA

<table>
<thead>
<tr>
<th>Year</th>
<th>Stocks-T bills</th>
<th></th>
<th>Stocks-T bonds</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Arithmetic (%)</td>
<td>Geometric (%)</td>
<td>Arithmetic (%)</td>
<td>Geometric (%)</td>
</tr>
<tr>
<td>1928-2007</td>
<td>7.78</td>
<td>5.94</td>
<td>6.42</td>
<td>4.79</td>
</tr>
<tr>
<td>1967-2007</td>
<td>5.94</td>
<td>4.75</td>
<td>4.33</td>
<td>3.50</td>
</tr>
<tr>
<td>1997-2007</td>
<td>5.26</td>
<td>3.86</td>
<td>2.68</td>
<td>1.51</td>
</tr>
</tbody>
</table>


If for a developed financial market such as the US the problems are paramount, they are clearly more complex when the equity cost of capital has to be estimated in countries like Portugal, where the stock exchange is very narrow in terms of listed firms and present a much lower degree of liquidity (Alpalhão & Alves, 2003).

Using, once again, the Bayer financial report for 2003 to present an example of how companies deal with these problems, the company produced the following information regarding impairment tests, the relevant cost of capital and, finally, the charges taken against profits:

The value in use was determined from the present value of future cash flows, based on continuing use of the asset by the strategic business entity and its retirement at the end of its useful life. The cash flow forecasts were derived from the current long-term planning for the Bayer Group. This discount rate was determined from in-house analyses of the weighted average cost of capital (WACC). A capital structure for each subgroup was determined for each subgroup by first calculating its theoretical stockholder’s equity on the basis of market capitalization of Bayer AG, taking into account sector-specific financing structures. For the global strategic business entities subjected to impairment testing, the WACC used to discount the estimated cash flow varied between 6% and 10%, depending on the specific risk intrinsic to the respective asset. The following capital cost bands were applied to the segments tested for impairment (see Table 3).

Table 3
Capital Cost of Segment for Impairment

<table>
<thead>
<tr>
<th>Segment</th>
<th>Capital cost (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polyurethanes, Coatings, Fibers</td>
<td>6-8</td>
</tr>
<tr>
<td>Plastics, Rubber</td>
<td>6-9</td>
</tr>
<tr>
<td>Chemicals</td>
<td>7-8</td>
</tr>
<tr>
<td>Pharmaceuticals, Biological Products</td>
<td>9</td>
</tr>
</tbody>
</table>

The following impairment losses were recognized on the noncurrent assets of the Bayer Group and its
AN INCREASING RIFT BETWEEN TAX AND BOOK INCOME

reporting segments (see Table 4).

Returning to the new financial accounting system introduced in Portugal in 2010, the treatment of impairment charges is to consider them as costs, therefore reducing net income. Obviously that as impairment losses can include significant charges against profits; the tax authorities had a particular interest in regulating its treatment.

Table 4
Impairment Losses on the Noncurrent Assets of the Bayer Group and Its Reporting Segments

<table>
<thead>
<tr>
<th></th>
<th>2002</th>
<th>2003</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goodwill</td>
<td>5</td>
<td>167</td>
</tr>
<tr>
<td>Intangible assets, (excluding goodwill)</td>
<td>200</td>
<td>511</td>
</tr>
<tr>
<td>Property, plant and equipment</td>
<td>84</td>
<td>1,131</td>
</tr>
<tr>
<td>Total ( mil euro)</td>
<td>289</td>
<td>1,809</td>
</tr>
</tbody>
</table>

The Tax Treatment of Impairment Losses

The tax treatment of impairment losses is regulated in Article 35, No. 1, of the (revised)\(^5\) corporate income tax code (CITC).

The rule established in the legal framework is that impairment losses recognized in tangible assets, intangible assets, biological assets (non consumables) and investment properties can be tax deductible.

Article 38, No.1, of the CITC states the factors that can lead to tax deductible impairment losses, which are: exceptionally fast technical innovations, changes in the legal context with adverse effects, natural phenomena and disasters.

For example, if a pharmaceutical company has a CGU producing a drug which is taken out of the market by a legal decision of the Health Ministry, or, in the same company, a technical innovation renders its production line obsolete before the end of its estimated useful life, and then conditions are met to deduct these impairment losses for tax purposes. But these are necessary–not sufficient-conditions.

In fact Article 38, No. 2, mandates a previous analysis by the tax authorities to allow the applying company a deduction of the impairment loss. That is, after the accounting recognition, the firm sends a complete file to the tax authorities stating the causes and the amount of the impairment charge. And only after its validation by the tax authorities can the firm deduct the loss for tax purposes.

Tax authorities can validate or not the accounting loss. If they validate the impairment charge, no divergence arises between book and tax income. But if it is denied, then Article 35, No. 4, establishes that the firm can deduct (for tax purposes) the loss in the subsequent years until the end of the asset’s life. This is a way of not flatly denying (but postponing) the tax deduction of the loss.

An example (see Table 5) illustrates how this operates when tax authorities deny the impairment deduction in the year when it occurs. Suppose that a company acquired a tangible asset in year 1, and that the depreciation rate, also used for tax purposes, is 10%. Moreover, its residual value is nil and in year 4 an impairment charge of 150 is recognized.

If, in year 9, the asset is sold for 180, what is the gain/loss for accounting and tax purposes?

Given the assumptions, in year 9 the accounting gain is computed as:

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\(^5\) This revision was triggered by the introduction of an IFRS-IAS based new accounting system (SNC). Given that new items such as impairments, fair value, etc., appeared (or were developed) on the accounting side, they had to be regulated by the CITC.
Gain (ACC) = 180 - (1000 - 4*100 - 4*75 - 150) = 30

On the other hand, the tax loss is given by:
Loss (TAX) = 180 - (1000 - 800) = -20

The difference comes from the amount of the impairment charge that, for tax purposes, was not deducted in years 9 and 10. The consequence of the tax authorities not accepting the loss of 150 in year 4 implies that 150/6 = 25 is allowed as a tax deduction from years 5 to 10. Thus the accounting gain is transformed into a tax loss, resulting from the (not yet deducted) impairment losses of years 9 and 10, which are 25 in every of these two years.

Table 5

<table>
<thead>
<tr>
<th>Year</th>
<th>Depreciation (ACC)</th>
<th>Impairment loss</th>
<th>Net book value</th>
<th>Tax corrections to accounting income (Tax)</th>
<th>Deprec + Impairm (Tax)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>100</td>
<td>900</td>
<td>-</td>
<td>-</td>
<td>100</td>
</tr>
<tr>
<td>2</td>
<td>100</td>
<td>800</td>
<td>-</td>
<td>-</td>
<td>100</td>
</tr>
<tr>
<td>3</td>
<td>100</td>
<td>700</td>
<td>-</td>
<td>-</td>
<td>100</td>
</tr>
<tr>
<td>4</td>
<td>100</td>
<td>150</td>
<td>450</td>
<td>+ 150</td>
<td>100</td>
</tr>
<tr>
<td>5</td>
<td>75</td>
<td>375</td>
<td>-25</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>75</td>
<td>300</td>
<td>-25</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>75</td>
<td>225</td>
<td>-25</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>75</td>
<td>150</td>
<td>-25</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>75</td>
<td>75</td>
<td>-25</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>75</td>
<td>0</td>
<td>-25</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

Some conclusions can be highlighted. The tax authorities will have a significant leeway to accept or deny impairment losses recognized by firms in the new Portuguese corporate tax environment. In situations of refusal by the tax authorities, significant book-tax divergence can arise from the distinct rules for the accounting and tax treatment of impairment losses.

Given that, in most cases, especially when technical innovation triggers an impairment of assets, tax authorities will have a tough job analyzing its impact on assets’ valuation, its foreseeable that they will play a defensive game, by denying the tax deduction of such losses. The future proportional deduction of the loss is a way of giving firms a tax deduction in subsequent years and reduces the negative effect of these contentious issues between firms and tax authorities. This is a technical tax solution where pragmatism and political considerations may have been the foundations of the legal text.

Provisions

Introduction

Usually, the CIT is, in many countries, very detailed about the accounting expenses that can also be deductible for tax purposes (D. Schanz & S. Schanz, 2010).

When it comes to provisions tax policy is an important tool for influencing when they are recorded. A more generous tax treatment (meaning that these expenses, when they are recognized, have a tax cost advantage over its accounting treatment) would send a signal to firms about how certain expenses are encouraged.

In this section, I will compare the accounting treatment that the recent introduction of International
Financial Reporting Standards (IFRS-IAS) in Portugal established relatively to provisions and analyze the related changes in the CIT.

As I shall illustrate, with a hypothetical example, the tax treatment could be more attuned with the accounting side. The solution was adopted in the new CIT clearly restricts-comparably to the accounting treatment-the tax deductively of provisions. Thus another element of book-tax divergence is introduced in the CITC.

**The Treatment of Provisions for in the New Portuguese Accounting System**

From January 2010, Portugal adopted the “Sistema de Normalização Contabilística (SNC)”. It is an IFRS-IAS based system, moving the Portuguese accounting concepts and practices towards the international trends defined by the International Accounting Standards Board (IASB)⁶.

Regarding provisions, one Accounting Standard (NCRF 21) deals with “Provisions, contingent liabilities and contingent assets”⁷. This standard states specific rules concerning:

1. When is a provision recognized?
2. How to compute its recorded amount?
3. What are the specific rules (if any) for some specific provisions?

The first question is of paramount importance. The fact is a provision recognized or not directly affects the net income of a company. Thus, economic and financial measures of performance such as return ratios, solvency ratios and others are influenced. As it is well known, a variety of stakeholders make decisions partly based on the reported performance (Damodaran, 2001).

The rule for recognizing a provision states that if it is probable⁸ that a future outflow arising from a present liability resulting from past events will occur, and an estimate can be made for that outflow, then a provision must be recognized.

Alternatively, if a reasonable estimate can not be made, a contingent liability must be disclosed in the notes to financial statements. Finally, if the possibility of future outflows is remote, then neither a provision nor a contingent liability is included in the financial reports. These concepts and situations can be discussed with real life examples taken from financial reports. The next transcript, from the Portugal Telecom annual report of 2008, is a good example:

**Regulatory Investigations and Litigation may lead to Fines or Other Penalties**

We are regularly involved in litigation, regulatory inquiries and investigations involving our operations. Current inquiries and investigations include several complaints before the Autoridade da Concorrência related to alleged anti-competitive practices in our wire line business, including complaints against:

- PT Comunicações for alleged anti-competitive practices in the broadband Internet market. This complaint was formerly against Telepac, which merged with a PT affiliate that later merged into PT Comunicações. On September 2, 2009, PT and PT Comunicações were notified by the Autoridade da Concorrência of its decision imposing a fine of A45 million for PT’s alleged abuse of its dominant position in the broadband internet market. On September 29, 2009, we appealed this decision before the Commercial Court of Lisbon. We have not recorded a provision for this contingency.

- PT Comunicações for alleged abuse of dominant position relating to the alleged refusal to provide access to its ducts. On August 1, 2007, Autoridade da Concorrência imposed a fine of A38 million for this alleged anti-competitive practice.

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⁶ This is, in my view, not a radical change. The previous regime–based on the Plano Oficial de Contabilidade (POC) and Accounting Directives–had already introduced several features of IAS-IFRS. But the new regime is more systematic, more complete in terms of standards and makes a broader use of concepts such as “fair value”, “impairment charges”, “biological assets” and others.

⁷ See Almeida et al. (2009), for a more detailed analysis of this NCRF.

⁸ In this context, “probable” means, according to NCRF 21, “more probable than not”.
and the Company has appealed this fine before the Commercial Court in Lisbon. On March 2, 2010, PT Comunicações was cleared by the Commercial Court of Lisbon from the fine imposed in 2007. On March 12, 2010, the Autoridade da Concorrência appealed the decision of the Commercial Court to a higher court (Tribunal da Relação). The appeal suspended the decision of Autoridade da Concorrência pending a decision by the higher court. We have not recorded a provision for this contingency.

Discussing why the firm did not record a provision is an interesting way of consolidating the economic and legal basis for the decision. It also shows the complexities of real life situations when a manager has to decide to record a provision, and reduce profits, or simply to disclose a contingent liability.

It is obvious that provisions are, by nature, very dependent on forecasts of events. The outcome of a lawsuit, the outflows linked to warranties effectively used by customers, or the environmental expenses related to the cleaning of a mining site in five or ten years are dependent on estimates of future expenses. The role of external experts can be quite important, as in many cases a firm has no internal expertise to forecast if a future probable outflow will happen and its magnitude.

On top of this, auditors must keep a detailed assessment of the reasonableness of provisions, in order to check if the level of accuracy of financial reporting is appropriate. Some past events do not bode well for this task (Mulford & Comiskey, 2002; Toffler, 2003).

Given these sources of uncertainty related to the recognition of provisions, what does the relevant Portuguese accounting standard (NCRF 21) establish regarding the process of computation? In general terms, §§ 35 to 46 of NCRF 21 deal with this question. The principle established is that the availability of a reliable estimate is the cornerstone of the process of computing a provision. This implies the ability to forecast future expenses, which must be based on a detailed plan where cost estimates have to be included.

The important question of how to deal with present estimates of expenses that will happen in latter periods is also treated in NCRF 21, by allowing the use of present value techniques.

As far as environmental related provisions are concerned, §39 establishes what types of expenses can be included when a provision is recognized.

When the present value is to be used, §§42 to 46 specify detailed rules for using this method. After stating the acceptability of discounting when the time value of expenses is “material”, the standard also establishes that a detailed plan, including a schedule for forecasted outflows, must be available to check the reasonableness of estimates.

It also deals with the questions related to discount rates, and the revisions of estimates whenever new information can impact the forecasted expenses related to environmental liabilities.

As the example used in this section of the paper is based on the present value of future outflows, it is worthwhile to develop this topic. In fact, when a provision is to be recognized by its present value in some initial period then, in future periods, until the expenses are really incurred with the correspondent outflows, the method of capitalization must be used in order to allocate to every reporting period the additional relevant cost.

As an illustration, if a mining company is operating in year 1 and (in the same year) recognizes a provision of 500 for environmental related expenses that are expected to be borne in year 5, and assuming a discount rate of 6%, then the recognized cost in year 1 is $500/1.06^4$, or 396.04.

In year 2, the cost to be recognized is $0.06\times396.04$, or 23.76. In year 5, the amount of accumulated provision is, naturally, 500. But, and this is an important point, as I shall highlight later, the lion share of the
cost is imputed to period 1. If the tax treatment of the provision follows this accounting method, then a
c onsiderable tax saving is made in the year of recognition, because deductible costs will be much higher that in
periods 2 to 5. But if is this is not the case—that is, if the tax deductively follows a different rule when
compared to the accounting treatment of these provisions—than significant tax advantages or disadvantages
can arise.

The Tax Treatment of Provisions in the New CIT

The first thing worth stressing when comparing the provisions established in the SNC with the ones which
tax deductively is permitted under the Portuguese CIT is the narrowness of the latter.

In fact, in the SNC the following provisions are allowed:

(1) Taxes;
(2) Warranties given to customers;
(3) Lawsuits;
(4) Job related injuries and professional illnesses;
(5) Environmental damages;
(6) Onerous contracts;
(7) Restructuring;
(8) Other provisions.

In the CIT, the ones that are allowed for tax purposes are:

(1) Litigation processes and related liabilities;
(2) Warranties given to customers;
(3) Environmental damages.

These two sets of provisions (the one allowed by the IFRS based accounting system and the tax deductible
much restricted set) are very clear in their differences. A first important point to highlight is the wide disparity
between book and tax principles applied her.

No significant surprise should arise. Historically, tax legislators tend to be cautious when it comes to the
tax deduction of expenses based on estimates. Thus, depreciations, impairment charges, provisions or changes
in fair value have a quite detailed tax discipline (Martins, 2010). The main purpose of which is to set limits or
conditions for the acceptance of these expenses in the computation of taxable income.

Another relevant issue to mention is that, for tax purposes, the provision for warranties given to customers
is based on a proportion that is to be computed based on the average of warranty related expenses for the last
three years, divided by the amount of sales under the warranty rule in the same three year period.

But no one knows what to do—regarding taxable income computation—if a company starts its activity and
has no historical data to base the proportion to be used in the computation of tax deduction. For accounting
purposes it could use, for example, the sector average; but given the wording of the tax law, that method could
be disallowed.

Another topic is the not deductively of provisions for restructuring charges. Given that, in times of
economic crisis, these provisions can be quite frequent, another important time difference—and related
deferred tax asset—is to be recognized, therefore contributing to increase the rift between tax and book income.

A final important point is that the Portuguese CIT deals with provisions in Article 39. But a whole
separate Article 40 deals specifically with the tax treatment of provisions for environmental damages. What are then the main features arising from Articles 39 and 40?

Article 39 establishes what type of provisions is tax deductible. (This list was already shown above). As far as the topic of this section is concerned, it is of particular interest Article 39, nº 3, which states: “When the provision is to be recognized by the present value, the expenses related to the discount method are also subject to this regime.”

Thus rule implies that, for example, when a provision for a liability arising from a lawsuit that is expected to be settled some years later, then the accounting and tax treatment are similar. If company ALFA expects to pay a former employee that sued the firm an amount of 50,000 € to be disbursed four years latter, if conditions for recognizing a provision are met and the discount rate is 6%, then, in year 1, the accounting and tax expense is 39,605 €.

Thus, from a tax policy perspective, and in what concerns provisions for environmental damages, three solutions are possible:

(1) According the same treatment, therefore allowing the accounting expense to be tax deductible in the period they arise;

(2) According a more favorable tax treatment, by allowing a higher deduction in early years, and therefore, coteries paribus, increasing the present value of the tax deduction;

(3) Establish a more restrictive regime for tax deduction, thus creating a tax disadvantage when comparing to the accounting treatment.

What solution did the Portuguese new CIT implemented? Article 40 of the CIT states:

The annual expense … is equal to the estimated total costs to be incurred at the end of exploration of the site where environmental damage was done, divided by the number of years that are left to the end of the operating activities.

Thus if company BETA Inc which is operating, say, a mine, is expecting to close its activities at year 6 and forecasts, at the end of year 1, an amount of 900,000 € to repair environmental damages, then the tax deductible amount for each year (1 to 6) is 900,000/6 = 150,000 €.

It is obvious that this is a very different regime from the accounting one. If present value was allowed for tax purposes, and supposing a discount rate of 6%, the tax expense in year 1 would be 672,532 €.

The tax regime is clearly less favorable than the one established in accounting rules. The case study presented below will get into this difference in greater detail.

Before dealing with the quantitative impact of the tax/accounting differences, what reason can be envisaged to justify the disparity in the regimes for provisions for lawsuits or customer’s warranties on the one hand, and for environmental damages on the other hand?

It is always difficult trying to read the motives of tax legislators…In my view, the disparity can possibly be traced to the fact that in estimating future environmental liabilities companies have greater leeway, in comparison with the two other types of provisions.

In fact, future outflows related from a lawsuit or for warranties have a substantial external base to be estimated. This could be a motive influencing a more restrictive approach by tax legislators. In a lawsuit, an external part (the plaintiff) claims a certain amount to be settled by the defendant (the company). In warranties, the tax rule establishes a maximum percentage of annual expense that can be recognized for tax purposes,
which is related to the average warranty expenses of the past three years.

But when it comes to environmental damages, a future estimate of expenses is dependent on the management own assessment. May be this greater potential flexibility induced a stricter tax regime.

What is unquestionable is that the tax treatment of provisions for environmental damages is clearly less advantageous than the accounting treatment, and, on top of this, it is also less generous than the one granted to other types of tax deductible provisions. It can thus be concluded that the tax factor is a potential negative influence for the recognition of this provisions. The next section uses an example as a hypothetical teaching tool to consolidate students’ perception of the divergence between tax/accounting methods of computing provisions for environmental expenses and to guide them to appraise the more or less environmental friendly aspects of the tax code.

Fair Value Method and Some of Its Tax Consequences

Introduction

Accounting as been moving from as historical cost (HC) based paradigm towards a fair value (FV) centered methodology of valuation (Tournier, 2000). The new IFRS based Portuguese system (SNC) followed this trend.

Whoever has attended finance courses understand that if financial reports are to be helpful to gauge the value of a company as a going concern, the historical cost has little meaning. Figure 1 is an appropriate tool to introduce students to HC Vs FV controversies.

Figure 1. Accounting values: Two perspectives.

However, many in the accounting research dispute the view that financial reports should have a sits primary objective firm valuation (Holthausen & Watts, 2001).

In tax terms, article 18 of the CITC establishes the most important rule about the tax effects of using fair value (FV). It states, in its § 9, that accounting gains and losses resulting from FV do not affect taxable income. However, these gains and losses affect taxable income when:

(1) They arise from financial instruments recognized at FV, provided that, being equity instruments, FV is based on prices taken from a regulated market and the taxpayer does not hold more than 5% of the share capital in the participated firm.

(2) The CIT code explicitly allows fair value gains or losses to influence taxable income.

This legal solution to establish the FV impact on taxable income is thus characterized by:

(1) A rule: FV does not influence taxable income. If this rule was unqualified, then a total separation between accounting and tax consequences of FV would have been the choice of the Portuguese tax legislators;

(2) Several exceptions, which are not, in my view, always clear in their meaning;

(3) A legal arrangement that could be better, especially when compared with the ones enacted regarding provisions or impairment charges.
I turn now to the discussion of these topics.

An Overview of Some Tax Rules Regarding Fair Value

According to Accounting Statements (NCRF) enacted in Portugal in 2010, FV can be used in every major category of assets. Thus, fixed tangibles, intangibles, biological assets, inventory, trade receivables or financial instruments, can be recognized at FV, provided that a reliable estimate (e.g., prices taken from organized market) exists.

However, even for assets recognized at historical costs (e.g., a tangible asset used in production or, more commonly, a group of assets that are aggregated in cash generating units or cash flow units) impairment tests must compare recorded values with recoverable amounts. The recoverable amount is being the higher of FV (less the cost of selling) or the value in use. Thus, even for some assets recorded at HC, the use of FV is (indirectly) linked to periodical valuation through impairment tests.

Nonetheless, the aim here is to focus on assets whose primary valuation method (that is, the chosen method for regular bookkeeping) is FV. And, in these cases, article 18, § 9, of the CITC establishes a general rule that FV accounting does not influence taxable income. In short, it seems that a total non conformity between book-tax would have been set up regarding FV. But this is not the case.

In fact, after stating this general rule in § 9, another rule (§ 9a) related to financial instruments can be summarized in the following way:

1. If they are not equity instruments then FV gains and losses are tax relevant;
2. If they are equity instruments FV is tax relevant, but only if some conditions are respected.

Then, in a sort of legal construction I find not the best one, § 9b explicitly states that FV accounting has tax effects every time it is allowed by the CITC.

This means that we have to browse through the whole CITC to find other cases when FV impacts taxable income. Two examples can illustrate this problem. In article 23, it is established that losses arising from the use of FV in consumable biological assets are tax deductible. In article 50, it is stated that revenues or expenses arising from the use of FV in assets that are part of a portfolio of life insurance companies are tax relevant. And other examples of tax relevance of FV can be found in articles 20 and 49. A wide dispersion of rules can be found in CITC as far as FV tax impact is concerned.

This is confusing, given the general nature of the rule in article 18, and that the same article 18 includes rules for the tax treatment of some financial instruments. This legal solution does not facilitate taxpayer’s application of the corporate tax code rules, nor tax experts’ perception of the legislator intentions.

As a comparative exercise, I find that the tax treatment of provisions or impairment loses in more rational. In the case of provisions articles 39 and 40 concentrate all the rules regarding their tax deduction. In the case of impairment charges, articles 35 and 38 are the ones where the tax treatment is to be found. Why such dispersion in the case of FV?

Still regarding FV, it is worthwhile to stress another particular case of book tax non conformity. When dealing with biological assets (BA) the appropriate NCRF states that FV is, by default, the right valuation method. The NCRF goes as far as establishing that there is a presumption that for every BA there is a source which can support the FV accounting method. This presumption is valid for consumable and non-consumable BA.

The NCRF also states that this presumption can be refuted at the time of initial recognition.
When it comes to the tax side, Articles 20 and 23 of the CITC state that FV gains or losses recognized in consumable assets are tax relevant. But regarding non consumable BA, the use of FV (mandatory by the accounting statement) is irrelevant for tax purposes. We get to this conclusion because article 18 states the general rule of tax irrelevancy, and no other article in the CITC establishes—following article 18, § 9b—that FV changes in non consumable BA are to relevant.

For non consumable BA, Article 35 states the possibility of impairment losses being tax deductible. This means that a company recording a non consumable BA using FV has no chance of seeing any change in the value of the asset being tax relevant, as the NCRF only allows impairment tests in BA that are recognized in a company balance sheet at HC. To sum up, the firms must use FV by default, given the accounting rule; and then the tax code denies tax relevancy to any FV change. It would not be surprising if companies that hold no consumable BA say that FV is not applicable to their case, and only HC can be used as valuation method. Using this expedient, at least impairment charges have a possibility of being tax deductible.

An Example of FV and HC Tax Consequences for Non Consumable Bio Assets

As examples have been used in this paper to illustrate other book-tax non conformities, in the case of BA and FV, suppose a vineyard with 1000 acres in the Portuguese wine region of Douro (where Port wine grows) was bought, in 2011, for one million euro. The vineyard is fully planted with the variety “Touriga”, which is used for strong reds.

Supposing also that (which is generally the case) a market price exists for the vineyards in the region, the firm recognized a BA using FV as the valuation method.

If, in 2012, a disaster (such a plague or acid rain) befalls upon the vineyard and its current market price is reduced by 40%, the company records a loss in the FV in the appropriate account of SNC set of accounts. But given the tax rules, this loss is not tax deductible.

However, had the company used the HC method (claiming that no market price existed regularly for the vineyard) then an impairment loss would be recognized. Under articles 35 and 38 of the CITC, if the tax authorities allowed the deduction that loss could be used to diminish the taxable revenue.12

The choice of FV would hinder the company tax position in the case of an upcoming loss; where the use of HC would be more tax favored. I can not see a defensible reason for such a disparity and non-conformity situation.

Conclusion

Recently, the Portuguese accounting and tax rules for computing corporate profits were changed. In the area of impairment losses, provisions and fair value important changes occurred, as Portugal adopted an accounting framework based on IAS-IFRS. As provisions are estimates, the tax authorities tend to impose limits to the deductively of provisions, given its nature and its potential for tax manipulation. When it comes to specific provisions, such as provisions for future environmental liabilities, tax policy has a tool for influencing how these are recorded for tax purposes. A more generous tax treatment (meaning that these

10 More specifically, they are deductible only after (accordingly to article 38) the tax authorities authorize to be.
11 Portugal’s main wine varieties are quite diverse from the world trend that adopted “Cabernet”, “Chardonnay” or “Merlot”. Typical local varieties such as “Touriga”, “Bical” or “Alvarinho” make unique wines now progressively being recognized in international markets.
12 And here is a case where the tax authorities have a perfectly reasonable ground to authorize the deduction, given the objective cause of the vineyard loss of value.
expenses, when they are recognized, have a tax advantage over its accounting treatment) would send a signal to firms about how environmental related expenses are encouraged. Thus, if decision makers respond to incentives, tax policy could be a tool for more environmental friendly decisions.

The use of fair value and its differences in tax matters in comparison to the use of historical cost can be a complex issue to deal with. Once again, the tax rule scan is quite different from IFRS based principles, and prone to increase the rift between tax and book income.

References
The Art of Publishing

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This paper’s goal is to help accounting academics better navigate the editorial review process to increase the likelihood of a manuscript’s publication. The authors draw on their years of experience as active scholars, reviewers, and editors of academic journals to provide practical insights on manuscript preparation, submission, and revision. Specific topics include (1) selecting an appropriate journal, (2) choosing an appropriate strategy to address a research question, (3) organizing a paper’s structure including the abstract, motivation section, literature review, implications and conclusions, (4) writing style and (5) revising a manuscript.

Keywords: publishing, research, journal submission

Introduction

Publishing in accounting academic journals is no easy feat. The process can be so daunting that many faculty members publish relatively few articles in their academic careers. Accounting doctoral programs often focus on a limited number of research strategies targeted for publishing in a select set of academic journals. They rarely discuss approaches to journal selection and submission, or the process of framing a manuscript. Consequently, accounting faculty may not understand the practicalities of the research and manuscript submission process. Faculty members can become frustrated by the process and simply give up. This is tragic given that many of our colleagues have research and pedagogical experiences to share, but do not, given their negative experiences with journal review procedures. Our experience as authors, reviewers, and journal editors, has prompted us to a broader, more complete perspective to help potential authors navigate the research and publication process, so that their work ultimately can improve the accounting discipline.

We provide practical insights into how to properly motivate a manuscript and manage it through the review process. These include discussions of research strategy and journal selection. We also present guidance for organizing and preparing a paper, with an emphasis on critical content and a manuscript’s structure including abstracts, motivation, literature review, implications and conclusions. Our discussion also addresses the effect of writing quality on the review process, and ultimately a paper’s acceptance for publication. We conclude by presenting guidance for addressing referee comments and revising a manuscript for resubmission. Our approach is to pose questions for the reader to consider to which we then provide our insights.

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Selecting a Journal

Who Is the Target Audience for the Manuscript?

Authors often select publication outlets for reasons that may negatively impact publication chances. For example, accreditation pressures increasingly are prompting business schools to develop “journal lists” to direct faculty publication efforts. However, all written works may not be suitable for all of these journals’ readerships. Therefore, prospective authors should ask themselves who their target audience is, who do they wish to impact, and who would be attracted to the manuscript style. If the target audience is largely academic, the author should submit the manuscript to a journal whose stated objectives convey that academics are the predominant audience. Authors must be realistic about the impact and message of their manuscript. When submitting to academic journals, authors should expect to revise and resubmit the manuscript prior to its acceptance, usually once, but no more than three times. Most academic journals consume between three and six months between submission and initial editorial response.

If the audience is largely business professionals, authors should be aware that manuscripts published in these journals are often invited. While the journals may consider unsolicited manuscripts, they do not actively pursue them as do academic journals. In contrast to academic journals, review time is short as these “practitioner” journals frequently publish monthly, and articles usually are free of complex statistical analysis of quantitative data. Authors can expect a required revision that is largely editorial in nature, but nothing like the revision requirements encountered when submitting to an academic journal.

Who Is the Editor?

Journal editors have very different attitudes and perspectives on manuscript submissions. We have observed two distinct editorial mentalities that we call “the keepers of the keys to the Kingdom” and “The promoters of scholarship.” The former looks to reject most papers presumably to maintain or elevate a journal’s “status” among a narrow readership, while the latter works with authors to find a way to publish a paper so that an author’s findings can be shared with a broad audience. Knowing something of the editorial perspective can help authors decide where to send a manuscript, and what to expect from the paper review process. Certainly the “academic grapevine” can provide clues. Academic colleagues discuss their experiences at academic meetings, and editors frequently participate in forums where they answer questions about their journals. Faculty mentors, colleagues at doctoral-granting institutions, and friends all can provide useful insights. Authors also should recognize that editorships change, particularly at journals sponsored by academic organizations, where editors may have fixed terms.

What Does the Author’s Academic Institution Expect?

As noted previously, some institutions create journal lists to guide promotion and tenure decisions, as well as annual performance measurement. These lists usually are based on published journal rankings, although such ratings often are flawed by research methodologies. Authors need to familiarize themselves with such standards, whether they are official or simply customary. One of the most difficult decisions authors routinely face is whether to conduct research and write to a journal list or to impact an audience.

When selecting a journal, authors also may find it useful to consult Cabell’s Directory of Publishing Opportunities, an on-line publication available in many university libraries. This resource provides a comprehensive listing of journals in all academic areas and details readership, editorial philosophy, submission process, and acceptance rates. Many institutions place a great deal of emphasis on published journal acceptance
rates despite the fact that this information is self-reported and cannot be confirmed independently.

**What Are the Journal’s Mission and Preferred Research Strategies?**

Most journals provide a statement of their mission. Below are parts of three from major academic journals that give authors a clear perspective on the kind of manuscript they seek.

*The Accounting Review:* “should be viewed as the premier journal for publishing articles reporting the results of accounting research and explaining and illustrating related research methodology...The primary, but not exclusive, audience should be—as it is now—academicians, graduate students, and others interested in accounting research.”

*The Journal of Accounting and Economics:* “encourages the application of economic theory to the explanation of accounting phenomena. It provides a forum for the publication of the highest quality manuscripts which employ economic analyses of accounting problems.”

*Advances in Accounting Education:* “is a refereed, academic journal whose purpose is to meet the needs of individuals interested in the educational process. We publish thoughtful, well-developed articles that are readable, relevant and reliable. Articles may be non-empirical or empirical. Our emphasis is pedagogy, and articles MUST explain how teaching methods or curricula/programs can be improved.”

Some journals have preferred research strategies and, conversely, strategies they do not consider. For example, some journals do not consider opinion research, particularly when the authors gather their data through a survey instrument. After reading the journal’s mission statement, authors should examine articles in the journal and contact the editors if they are concerned about the desirability of their research strategy for that journal.

**What Are the Journal’s Submission Procedures?**

Here are a few questions authors should consider.

1. Does the journal have a submission fee and, if so, will your school reimburse you? Can you get a pre-review from the editor?
2. Can you submit to multiple journals at the same time?
3. Have you reviewed the journal’s submission requirements?
4. Can you ask the editor prior to submission to make sure that there is NOT already a similar paper in the journal’s pipeline?

As editors we always respond to such requests to save time for everyone concerned. However, here is an example of what not to do:

“I’m wondering if you have any interest in the article. I haven’t sent it out and I’m contacting three journals to see if there’s an interest. Turn around time is important because the college is going through AACSB re-accreditation review. The dean requires a blind review and reviewer comments to be excited by the research.”

**How Many Articles Does the Journal Publish?**

Authors should examine the journal directly (or at least look at their website to see manuscript titles). They also should determine how many manuscripts the journals publish. We computed the annual number of articles published for following journals: *Journal of Accounting & Economics* (34), *The Accounting Review* (52), *Journal of Accounting & Public Policy* (24), *Advances in Accounting* (31), *Journal of Accounting Education* (9) and *Issues in Accounting Education* (12).

**Research Strategies**

We recommend that authors utilize the Buckley, Buckley and Chaing’s (1976) chart in Figure 1. In formulating an appropriate research strategy to gather data, the chart will help scholars select a sound way to answer the research question they pose. It clearly indicates that selection of a research question should precede the selection of a research strategy. The chart breaks research down into four categories defined as follows:
(1) Opinion: Seeking the views, judgments or appraisals of other persons regarding a research question;
(2) Empirical: Experiencing or observing phenomena him/herself rather than through the mediation of others;
(3) Archival: Examining recorded facts (original documents, secondary, i.e., published data gathered by others);
(4) Analytic: Using internal logic (23-26).

We have found two fatal flaws in manuscript submissions; unacceptable data and poor motivation. Authors can address other problems such as an incomplete literature review or inappropriate selection of a statistical technique. It is impossible, short of re-doing a study, to deal with data and motivation issues.

Abstracts

The abstract not only begins the manuscript but sets the tone. It is a strong, marketing tool. Rather than it being the last item they write before submission, authors should take time to give this element serious thought. Authors should ask themselves the following questions:

(1) Does the “executive summary” put the reader in a POSITIVE frame of mind?
(2) Do you emphasize the paper’s motivation (e.g., belief revision), major findings and implications?
(3) Do you simply “cut and paste” the introduction and/or conclusion into the abstract?

Below is an example of a weak abstract and what a reviewer says about it.
“Recently, NASBA has focused its attention towards mandating specific ethics coursework within the previous 150-hour requirement for eligibility to sit for the uniform CPA examination. This push for ethics heightened attention about ethics and is the basis for this study. The primary objective of this research study is to test the hypothesis that ethical coverage in accounting programs is an important factor in recruiting decisions for entry-level accounting positions… the results suggest that ethical coverage in accounting programs is not an important factor in recruiting decisions for entry-level accounting positions.”

Reviewer’s concern often is this:

“I am not clear about its incremental contribution to the recruiting literature.

At present, the entire motivation for the study stems from the so-called push for ethics education by the NASBA. I do not believe that this is an adequate motivation for the study to be accepted at Advances in Accounting Education. For example, the fact that this study concludes that ‘recruiters do not value ethics coursework’ is quite bold.”

Motivation

The Abstract introduces the manuscript and begins to market the topic. The Motivation should add significantly and present a compelling case for why the authors have written the manuscript. One of the most commonly cited reasons by referees for rejecting a manuscript is “poor motivation.” Professor Gerald Solomon at Indiana University uses a simple question based on the idea of “belief revision” to clarify what a properly motivated paper is. In assessing motivation, he asks “how has the manuscript changed the way a reader thinks about the issue presented?” If a paper has not affected a reader’s perception of the research question, then the paper is poorly motivated. Conversely, a well motivated paper is one that changes the way a reader thinks about an issue: It has “revised beliefs” that were previously held.

Here are several questions authors should ask themselves.

(1) Did selection of the research question precede the research strategy?
(2) Is there a lack of meaningful and tractable implications?
(3) Why did you take the time to engage in this project?
(4) Does the manuscript only update an older study or add a variable to a published model?
(5) Is the manuscript clear about what the contributions are?

We have found that at times scholars have a research strategy they wish to use and then they seek a research question. Invariably, they lack sound motivation for the research they conducted. The best answer for why they take the time is that they identified an interesting research question and the authors sought possible answers.

A paper’s motivation must provide a compelling case for why the authors wrote a manuscript, but more importantly why it should interest someone, and ultimately be published. An example of a poorly motivated manuscript follows.

“This paper presents a model that seeks to identify and integrate professional skill sets with the educational core values of the college in the development of the accounting curriculum. The model also serves as a unifying mechanism that enables faculty to design courses that develop skills at increasingly more sophisticated levels as students’ progress through the accounting curriculum. The model is utilized in the development of required as well as elective course offerings. And the model utilizes professionals and academics in the ongoing assessment of skills.”

The problem with the manuscript’s motivation is that it simply does not change the way the reader thinks about accounting program development and execution. Moreover, it implies that there is some unstated problem
with current accounting program curricula (i.e., the absence of profession skill set instruction) that motivated the development of this model. Nothing in the paper would “motivate” a program administrator to consider adopting the model. Conversely, the following paper extract clearly illustrates an example of a well motivated paper.

Teaching tax research challenges instructors to provide students with ample opportunities for hands-on practice and detailed feedback in resolving tax situations. We provide a researcher-reviewer pedagogy for tax research assignments that goes beyond the traditional approach to teaching tax research. We believe this pedagogy provides additional benefits: students critically review researchers’ work and provide written constructive criticism to researchers in a professional manner. In addition, we implemented our researcher-reviewer pedagogy using technology. It provided students with hands-on review experience, improved their ability to communicate electronically, and increased their overall computer competency and comfort.

**Literature Review**

Literature reviews should be a concise discussion of specific current studies that affect the manuscript’s motivation, research question, and method directly. They should take the reader to the hypotheses or theoretical development section. Frequently they are too long and provide irrelevant details about a prior study’s research methods and findings.

Authors feel the need to include all the studies in an area, rather than just the most current ones. Since the latter citations normally include the former ones, the current ones are sufficient. Here are several questions authors should ask themselves:

1. Does it show how the manuscript fits into and extends the literature?
2. Does the discussion go to the original source or is it “lifted” from other author’s interpretations?
3. Does it include pertinent citations from the journal to which the paper is being submitted?

Authors sometimes do not go to the original source and use another author’s interpretation. Authors should go to the original source themselves and, if they cannot do so, they should omit the reference. Authors also should review the journal to which they are planning to submit and be sure they have included pertinent citations from that journal. Failure to do so can indicate the authors are not familiar with the journal and/or are simply submitting a manuscript that other journals have rejected.

Below appear two reviewers’ comments about literature reviews:

“The ‘Literature Review’ section of the paper is very long and unfocused. It goes on for 15 pages covering a wide variety of topics such as Maslow’s hierarchy, Bloom’s Taxonomy, Anderson & Krathwohl’s revision to Bloom’s Taxonomy, Gagne’s Taxonomy, distance education, teaching technology, and the effect of the Internet.”

“The discussion provides a very shallow description of a large number of subjects and fails to adequately relate the information to the research questions. The long discussion does not assimilate the information to make a convincing case that student preferences relating to the issues addressed in the research questions are relevant and important.”

**Implications**

The manuscript must provide specific, tractable implications and recommendations for the target audience. They should be more than a sentence or two buried in the abstract, introduction, and conclusion. Implications warrant their own section and detailed discussion (after findings and before the conclusion). Absence of a section for implications or not including them at all may signal the manuscript lacks a sound motivation. Authors should avoid generalities such as “The study is important because…” or “Readers will appreciate the insights provided….”

Below is one reviewer’s comment.

“The findings on work experience and SAT are ones that we generally already know or intuitively guess and
are not surprising. Again, the manuscript does not help in suggesting educational implications of the findings.”

Conclusions

Conclusions should be concise and to the point. They should not mirror the abstract or introduction or take portions verbatim from other sections, i.e. the wording should be original. Authors should be careful not to leave the impression that the conclusion is an after thought and that they no longer had any interest in writing. They should articulate clearly what they found but must be careful not overstate the study’s findings. Authors should remember that the conclusion is the last impression they leave with the reader. Here are two questions for authors to keep in mind.

(1) Does it summarize the manuscript’s motivation, findings, and implications?
(2) Does it focus on the main points that you want the reader to take away from the manuscript?

Structure

We would recommend the following guidelines. Authors must remember that readers may not be as interested in the topic as the authors. Longer is not better, particularly for the initial review. Reviewers are likely to recommend places to expand the discussion but also may suggest the overall length of the paper should be about the same or shorter when the manuscript already is long. Parsimony is highly desirable. Authors should be concise; “less” frequently is better.

(1) Abstract (250 words);
(2) Introduction (1-2 pages);
(3) Literature Review (1-3 pages);
(4) Theoretical and Hypothesis Development (3-5 pages);
(5) Methodological Approach (3-5 pages);
(6) Findings and Results (3-5 pages);
(7) Implications (1-2 pages);
(8) Conclusion (1-2 pages).

Here are two questions authors should consider.

(1) Have the authors prepared the manuscript in accordance with all of the journal’s style guidelines?
(2) Have the authors been careful to avoid typing, spelling, and grammatical errors?

Failing to observe the journal’s style guidelines shows a lack of attention to detail and, more importantly, fails to show a real interest in that journal. Typing, spelling and grammatical errors can be deadly, particularly with the safeguards many software packages provide. They raise concerns among editors that the authors may have shown the same lack of attention to detail in the data gathering and analysis. We suggest the authors ask someone to proofread the manuscript whom is not intimately familiar with the subject matter and has a strong foundation in English.

Writing Style

Authors should write in a concise, straight-forward manner and use active voice. For example, if someone can pose the question “by whom?” and the authors have not made it clear, they have used passive voice. “It was said” is passive while “Professor Smith said” is active. The latter also is better than “It was said by Professor Smith.” We recommend authors read Elizabeth Danziger’s “Writing in Plain English” (Journal of Accountancy, July 1997, pp. 71-74). Authors should consider the following points:
(1) Do not include a “meandering stream” or a “great mystery story”;
(2) Do not describe every aspect of the research;
(3) Minimize the use of non-bibliographic footnotes by incorporating them into the text where appropriate.

Authors should try to work from a detailed outline and remain focused on the topic. They should avoid withholding discussion of results as if the manuscript was a work of fiction. The adage of “tell them what you are going to tell them, tell them, and tell them what you told them” is one to consider. Authors must try to identify the important aspects of the research and recognize that reviewers can (and will) ask for more detail. Most footnotes are not necessary. Authors should realize they break the reader’s continuity with frequent references. Most explanatory footnotes can fit within the text quite easily.

Authors should share their “final” draft with others. They should try imitating the review process by sending the manuscript to friends who do reviews for journals. Encourage them to be tough; better it be they than the reviewers. Authors also might consider “brown-bag” or “working paper sessions” to get feedback from colleagues. If English is not an author’s first language, or if writing is not her/his strong point, then enlisting the aid of a professional copy-editor is a good idea.

Revising a Manuscript

Revising a manuscript is a new beginning. Thus, authors should repeat many of the points that appear above. Here are some questions to consider when authors are revising to send the manuscript to a different journal:

(1) How did you pick another journal?
(2) Did you incorporate as many of the review comments as possible?
(3) Have you adjusted the format to fit the new journal’s style guidelines?

Authors should not simply pick a new journal and send the manuscript out immediately. They should carefully and critically evaluate why they received a rejection. They should avoid what we refer to as the “dumb referee” assumption (i.e., the reviewer just did not understand. Probably the authors’ explanations lacked some important elements). Authors should share comments with a colleague if they do not understand the feedback and even consider calling the editor for assistance. They also should address some of the reviewer comments for a very practical reason; it is possible the editors at the new journal may send the manuscript to the same reviewers. One time a reviewer contacted us and said, “I reviewed this manuscript for another journal and the authors have not changed a word. Can I send you the same review I used for the other journal?”

If authors are revising based on a “revise and resubmit” they need to address every issue raised by the reviewers. Authors explain their positions on each comment openly and clearly and consider using a comment sheet. For comments authors choose not to address, they must explain why. Very little get reviewers angrier than being ignored. Most accept when authors decide not to address a comment and discuss their reasoning, but they hate it when the authors say nothing. Frequently, reviewers become more stubborn about acceptance when that happens. Authors should avoid sarcasm and stubbornness and recognize they may have to make concessions to obtain an acceptance. Below is what one author said about a reviewer. This kind of response almost guarantees a rejection.

“I have read the comments and was dismayed to learn that they were based on both distortions of what I actually wrote and mistaken assumptions about the purpose of my study. I have responded to the reviewers’ comments in the attached Word file. I am willing to revise the manuscript somewhat and resubmit it, but only if the revision is examined by people other than the original reviewers, whom I’m not sure would be able to
objectively review the revision.”

Here are two reviewer responses to poorly done revisions.

(1) “Although you did address some of our points, we both felt that the revision was quite sloppy, with numerous typos, inaccurate references within the paper to things that were ‘previously’ discussed or would be discussed ‘later’, and a continued inability to clearly articulate the importance of the results. In fact, the writing quality and organization continue to be very poor. While we both continue to find the topic very interesting, we feel that this paper is not yet ready for publication, and still requires a bit of work.”

(2) “This is the second time this paper has been submitted to … while I applaud the improvements the authors have made to the paper in response to earlier reviewer comments, I am baffled as to why the authors would not give the reviewers the courtesy of telling them why they did not consider all the suggestions of the reviewers (my assumption is that the other reviewer did not get responses either). Authors can disagree with comments made by reviewers, but it is up to the authors to justify why suggestions were not entertained and/or acted on.”

Conclusion

We have discussed journal selection and identifying the manuscript’s audience, recognizing the impact of a journal’s editor on the review process, clearly determining the expectations the author’s university has for its faculty members, reviewing a journal’s mission to determine whether the journal is an appropriate outlet for the manuscript, considering whether the research strategy the author uses is consistent with that the journal publishes, and the quantity of manuscripts a journal publishes as an indirect method for assessing the likelihood of success.

We included Buckley, Buckley and Chaing’s (1976) work on research strategies to encourage authors to identify research questions before selecting a research strategy and then determining the best one to fit the circumstances. We have seen far too many circumstances when scholars chose the research strategy first and then searched for a research question to which they could apply the strategy. Frequently this sequence leads to poorly motivated manuscripts that add little to the extant literature.

We discussed a number of manuscript components such as the abstract as a major marketing tool, the motivation that must demonstrate the author’s excitement about the research question, a concise and pertinent literature review the links the motivation with the research question and shows how the manuscript adds to the reader’s knowledge of the subject, an implications section that supports the motivation and a conclusions section that leaves the readers with a review of what they have read.

Readers saw our suggestions for a structure to apply, one that can help them appreciate the relative lengths for each section of the manuscript. They also found suggestions relating to writing style, ones that can help improve the author’s writing quality. We also discussed a topic authors rarely have learned about other than through first-hand, and many times not pleasant experiences, revising a manuscript. We intended to help authors be ready to revise and avoid the pitfalls many of us have faced.

Reference

IPSAS and Accounting Systems in the Italian Public Administrations: Expected Changes and Implementation Scenarios*

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This paper proposes to identify the main features of a possible implementation path of the International Public Sector Accounting Standard (IPSAS) standards within the Italian local public administration. In perspective, local Public Administrations (PA) may represent the reference target for the introduction of IPSAS standards but a direct application in the short-run can hardly be imagined in the Italian context. According to the CFOs of medium-small Municipalities in the Lazio Region, the IPSAS enforcement strategy swings between the “forced” model and the “spontaneous” model. The application of IPSAS standards to Italian PAs depends on specific law provisions at all institutional levels and requires a process of implementation based on a bottom-up model “governed by the center”.

Keywords: accrual accounting, cash accounting, IPSAS, public finance and accounting system reforms

Introduction

Research Question

This paper identifies the main features of a possible implementation of the IPSAS standards within the Italian local public administration.

The choice of local governments as the reference target of our analysis is connected both with the results of some recent works on the applicability of the IPSASs to the Italian Public Administration (PA), which have taken into account various public administrations (Anselmi, Donato, Giovannelli, Pavan, & Zuccardi Merli, 2009), and with theoretical assumptions developed by the academics from the early 2000 (Farneti & Pozzoli, 2005).

Considering the various types of institutions that were examined (regional and local governments, universities, cultural agencies enterprises, Chambers of Commerce), the local PAs (provinces and municipalities) have showed to represent the field of the greatest relevance in the perspective of the performance management and improved accountability of the Italian PA.

The survey carried out in 2008 (Lazzini, Zanone in Anselmi, Donato, Giovannelli, Pavan, & Zuccardi Merli, 2009) has pointed to a limited knowledge of and interest in the IPSAS standards by top public managers and civil servants. Therefore, suitable measures are required to improve information, disseminate such knowledge, and overcome a strong resistance to change.

* Although this paper is the result of the work of both authors, paragraph 1 has been developed by Raffaele Trequattrini and paragraphs 2, 3, 4 and 5 by Noemi Rossi.

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Raffaele Trequattrini, professor, Faculty of Economics and Business, University of Cassino.
Until now, the central, regional and local PAs and the NHS have seen to the modification of their financial accounting systems strictly in keeping with the introduction and development of the New Public Management (NPM) paradigm.

In an attempt to answer the research question, we have decided to follow the logical path outlined below.

Hence, we have started with an analysis of the determinants, both inside and outside the PA system, related to the adoption of the IPSASs in the Italian public sector, characterized by a heterogeneous level of interest in the reform of the accounting systems.

Then, reference has been made to the main pressures exerted by the political and institutional system that affect the implementation policies and that may represent a key factor for the adoption of the IPSAS standards as well as other measures addressing the modernization and the managerial and organizational requalification of the PA. The latter includes quality-oriented measures and the introduction of pay-per-performance systems (Cepiku & Meneguzzo, 2010).

A review of the external pressures exerted on the outside of the different PAs and connected with the wave of the legislative innovations adopted in 2009 is particularly important to understand the institutional and administrative feasibility of alternative implementation policies of the IPSASs.

**Theoretical Background**

Recent and interesting considerations relative to the strategies for implementing the IPSAS standards (Ponzo in Anselmi, Donato, Giovannelli, Pavan, & Zuccardi Merli, 2009) have identified three alternative ways for the enforcement of the IPSASs, the so-called “forced”, “stimulated” and “spontaneous” arrangements.

Considering the variety of pressures derivating from the political and institutional context, we have chosen to examine the law concerning the reform of the public accounting and public finance, enacted in 2009.

This law, which confirms the prevalence in the Italian model of adoption of NPM, which may be defined as the PA modernization by laws, contains a series of information on the harmonization of the PA accounting systems. Such information makes up the reference framework for the future development of the IPSASs introduction and diffusion process.

The public finance and public accounting reform reflects an IPSASs implementation strategy based on a top-down approach (“forced” strategy). The key player is the central General Accounting Department (RGS-Ministry of Economy and Finance), entrusted with the public finance coordination, and associated with a number of measures, including IPSASs.

At the end of this paper we discuss a possible course of action for the introduction of the IPSASs.

The local PAs have highlighted a considerable reactivity and ability to answer to both the institutional pressures and the regulatory innovation with respect to the various NPM leverage tools (Rebora, 1999), including the accounting systems (Steccolini, 2004; Mussari, 2005).

In perspective, the local PAs may represent the reference target for the introduction of the IPSAS standards based on bottom-up approach (Cepiku, Meneguzzo, & Senese, 2008), consistent with the “spontaneous” implementation and, above all, coherent with the successful experiences of the adoption of the NPM logics in Italy.

In this paper we will systematize and analyze the institutional reference framework, backing up the public management approach with a plurality of interpretations that may lead to an improved understanding of the actual ability to implement the national guidelines on the harmonization of the accounting systems.

These interpretations may be referred to a variety of disciplinary approaches, from the legal approach,
which may be used to analyze the contents of the reform laws, to those peculiar to public economics and public finance, policy evaluation and administrative sciences.

It is unquestionable that the different perspectives prospects may prove useful to gain an insight into the actual institutional and administrative feasibility of potential scenarios for the implementation of the administrative and accounting innovation.

For instance, the public policy approach allows analyzing the likely implementation games (Wildawsky, 1992; Dente, 1999) that can be played by the various actors involved: firstly the Ministry of Economy and Finance.

Other important actors are the Bank of Italy and ISTAT, both of which are interested in the public finance and public accounts dynamics, as well the independent control authority (Corte dei Conti), and the public research think tanks (ISAE).

Additional important players are inter-institutional cooperation bodies (CNEL) and the Committees entities that are going to be set up in a short period for the implementation of fiscal federalism.

**Methods**

From a methodological point of view, we are aware that the answer to the initial research question may not be limited to the simple explanation of the contents of the likely implementation scenario, as it requires an empirical validation.

The latter can be performed through a survey of provinces and municipalities based on qualitative research methods (case study analysis).

The analysis of case studies (Yin, 1984), grounded on a survey of some local governments IPSAS oriented implementation experiences, and could allow identifying the characteristics of the likely implementation paths.

However, the empirical analysis proved unfeasible owing to the aforementioned reasons. In fact, no IPSAS adoption experiences are currently under way within the context of local public administration and Italian NHS.

The latter, together with the local governments, make up the sector showing greater responsiveness in the acknowledgment of the accounting innovation (Anessi Pessina, 2000) and are characterized by a widespread adoption of the accrual accounting by the local PA (Anselmi & Saita, 2002).

Aware of the relevance of an initial empirical check verification, we have decided to test the suggested implementation paths through a series of focused interviews to CFOs of municipalities and provinces in the Lazio Region identified as the key players.

The proposed model will be validated at two levels in the next months. Firstly, a focused survey shall be made of a significant sample of Municipalities, regional agencies and public health and hospital authorities in the Lazio Region coherent with implementation paths courses based on bottom-up approach.

Secondly, the proposed course shall be brought to the attention of the members of the independent body entrusted with the monitoring local governments’ financial management and involving academics and practitioners. This body carries on an accounting standard setting and, up to now, published a few documents that outline the framework of the national accounting standards (Observatory for Finance and Accounting in Local Governments, 2004 and 2006; www.osservatorio.interno.it).

Besides, the validation of the implementation course by one of the key players opens up a few interesting perspectives prospects at a research method level. The social network analysis could lead to a description of the relations and interactions among the different key players examining the ways in which the implementation course may be affected and conditioned, through public policies implementation scenarios.
The Political, Institutional and Social Pressures: Constraints and Enablers

In Italy, the IPSAS standards aroused interest and reflections at both a political and an academic level. Special attention is devoted to the way in which these standards may be reconciled with the changes that, particularly in recent years, have invested affected public sector accounting (Mussari, 2005; Farneti & Pozzoli, 2005).

In fact, the debate on the introduction of the IPSASs is part of more general reflection on the role of the accounting systems in the performing State models (Cepiku, Di Filippo, & Meneguzzo, 2007), coherent with the diffusion of performance management and performance evaluation logics in the PA.

From this point of view, it seems useful to refer however briefly to the modernization processes of the Italian PA in keeping with the NPM logics.

Therefore, compared with other industrialized countries, Italy has generally lagged behind, at least in chronological terms, in the introduction and concrete implementation of the NPM principles (Cepiku & Meneguzzo, 2010; Ongaro, 2002).

In Italy, the public sector reform has affected nearly all the components of public organizations, such as human resources management and organizational structures, financial management and performance management. Moreover, the innovations referring to the accounting systems have enabled the adoption in the public administrations of managerial techniques and systems coming from the private sector (accrual accounting instead of financial accounting) and the consolidation of performance management.

These innovations have led to a redefinition of the structure of the documents of the national budget (and those of many Regional governments) based on missions and programs, in line with what happened in the French public administration (LOLF-Loi Organique de Finances) (see Table 1).

Table 1
An Overview of PA Reforms in Italy

<table>
<thead>
<tr>
<th>Tools</th>
<th>Contents</th>
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<tbody>
<tr>
<td>Introduction of private management techniques</td>
<td>(1) Accrual and cost accounting</td>
</tr>
<tr>
<td></td>
<td>(2) Managerial controls</td>
</tr>
<tr>
<td></td>
<td>(3) Reduction of differences between of the public and private status of employees</td>
</tr>
<tr>
<td>Performance management</td>
<td>(1) Strategic planning, budgeting and auditing</td>
</tr>
<tr>
<td></td>
<td>(2) A new budget structure based on missions and programs and a tentative pilot spending review initiative</td>
</tr>
<tr>
<td></td>
<td>(3) Social reporting</td>
</tr>
</tbody>
</table>

The drivers for the PA reform were mainly external (the government); the reforms have been introduced through laws and central government guidelines and adopted at different levels through bottom-up innovation processes by local governments, schools and healthcare organizations.

So far, there has been no comprehensive evaluation of the reform packages and their implementation, except for a few individual sector-specific initiatives. The reform processes were driven by the laws but failed to ensure a homogeneous adoption of the modernization tools by all the public administrations in Italy.

The reform programs introduced in more recent times by the new Italian Minister for Public Administration and Innovation are based on an action plan, the so-called “Industrial Plan for PA”. The strategy is in its second year of implementation and has been backed up by the passage of the law on the PA performance, productivity and transparency, which defines a new integrated performance framework aimed at reinforcing the planning, measurement, control, evaluation and reward processes and at integrating organizational and individual performance. A National Commission is currently being set up and shall be
entrusted with the definition and dissemination of performance evaluation and transparency-oriented tools and guidelines as well as with the collection and analysis of performance results.

The action plan on performance, transparency and productivity in the Italian PA has been followed by two national laws that went through in 2009 and represents a significant pressure for change exerted by the institutional political system.

The likely impacts at the level of the accounting system change are not yet clear. In fact, the drive for improving the PA accountability requires significant measures leading to the preliminary definition of systems of quantitative and qualitative indicators and to the setting up of accounting data bases.

Indeed, the indicators are a fundamental requirement for the performance measurement and evaluation at a PA system level, through benchmarking processes (Tanese & Lucianelli, 2001) referring to public administration (organizational performance) as well as civil servants or professionals (individual performance).

Furthermore, the economic-financial dimension is one of the performance dimensions together with other such as service quality, impact of public policies, effectiveness, ethics, transparency and sustainability.

Therefore, we need to understand how the new accounting principles are going to support an improved evaluation of the economic-financial performance and how relevant the economic-financial dimension is going to be in more general framework of PA accountability.

Accrual accounting represents one of the likely answers of the PAs to the demand for accountability with regards to the use of the resources coming from the economic system, the management of the public and collective asset and the evaluation of the performance (services costs, efficiency and actual results).

The contents of the accounting function are enriched when moving from the traditional approach based on budget equilibriums and legitimacy towards a new orientation focused on ensuring support to political decision makers and the administrative techno-structure.

Then, the adoption of the IPSASs ensures the overall representation of the activity, improving the transparency with respect to external stakeholder. In terms of efficiency and effectiveness, an accrual-based accounting system places at our disposal information useful for the control of expenditures, in a cutback management and spending review perspective.

Hence, this allows the evaluation of the costs related to programs and services, and the monitoring of the allocation of resources. With regards to the environmental sustainability, this system allows the evaluation of the sustainability of public policies and of the impact of the privatization process.

The adoption of the IPSASs is consistent with the internal and external requirements of the public sector which call for a development of the economic-financial institutional information with regards to the improvement of public policies formulation, implementation and control.

The accounting standards contribute to a comprehensive survey of managerial decisions, a clear representation of the results and a quantification of the public value created.

The relevance attached by the recent law for the modernization of the PA to the performance management cycle and to the formulation of performance plans and reports is, in our opinion, an important indicator of the relatively lower priority attributed to the official accounting documents.

In fact, the investment on the performance management cycle, stress the centrality of the programming, budgeting and control systems in the PAs.

Other important pressures for change are represented, there are (1) fiscal federalism, (2) performance, transparency and productivity and (3) fiscal federalism. By the law on fiscal federalism (2009) and by the bill
The law on fiscal federalism introduces relevant changes in the Italian PA.

The law foresee a redistribution of the functions among the various government levels (from the central level to the regional and local levels), the introduction of new fiscal policies, the adoption of criteria for the transfer of the financial resources at a vertical level (from the center to the periphery) and at a horizontal level (among Regions; moreover the law).

The fiscal federalism is going to have a direct and immediate impact on different areas from the development of the public governance to the strategic and organizational choices of the public administrations.

A well designed and accurate economic-financial database represents a prerequisite for an effective implementation federalism.

In this perspective, it is very important to assess the impact that the new IPSAS accounting standards may give to the successful implementation of the new law on federalism. In our opinion, the importance of the performance management cycle represents a key indicator of the relatively lower priority attributed to the accounting documents.

In any case it should be borne in mind that the IPSASs are extensively used in public administrative systems (for instance, in Switzerland) characterized by an institutional and fiscal federalism (Bergmann, 2009; Caperchione, 2006) through the Harmonized Accounting Model (HAM) introduced between 1977 and 1981. The HAM did not introduce accrual-based accounting standards, as it has required a new system of public accounts based on the presentation of three accounting documents.

Finally, the third relevant driver for change is represented by the public accounting and public finance law that is going to be analyzed below.

**The 2009-2010 Public Finance and Public Accounting Reform**

A concise (synthetic) reference to Italy’s public accounting evolution process should prove useful in term of better understanding of effective impact and innovation.

The choice to analyze the introduction of the economic accounting was linked to an assessment of the weaknesses of the financial accounting, with special focus on the formality of the decision making process. This later is characterized by an insufficient comprehensiveness, a limited transparency and the complexity of the budget procedures.

The local health and hospital authorities acted as the pilot organizations in the reform of the PA accounting systems.

This first experiment was followed by the reforms of the accounting systems of local governments, central administrations, Regions and social security institutions.

The local governments have integrated their financial accounting with economic surveys, while the central administration has decided to introduce an economic-analytical accounting survey.

Besides, the reform process has also called for the introduction of strategic and management control, or rather of integrated systems to monitor to activities and policies of the Italian public administration.

Table 2 synthesizes the key stones of the path followed by the different public organizations in term of the reform of accounting systems and of the introduction of programming and control systems.
Table 2
The Reforms of the Accounting Systems

<table>
<thead>
<tr>
<th>Reforms of the accounting systems</th>
<th>Timeframe</th>
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<tbody>
<tr>
<td>Local health authorities and hospital authorities</td>
<td></td>
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<tr>
<td>(2) Introduction of management control systems</td>
<td></td>
</tr>
<tr>
<td>Local governments</td>
<td></td>
</tr>
<tr>
<td>(2) Introduction of managerial control instruments</td>
<td></td>
</tr>
<tr>
<td>(3) Introduction of performance budgets (based on objectives, programs and resources)</td>
<td></td>
</tr>
<tr>
<td>(4) Content and structure differentiation of the financial statements</td>
<td></td>
</tr>
<tr>
<td>Central government</td>
<td></td>
</tr>
<tr>
<td>(1) Introduction of a budget structure in keeping with the state organizational structure (budget by centers of accountability)</td>
<td>1978 and 1999</td>
</tr>
<tr>
<td>(2) Content and structure differentiation of the financial statements</td>
<td></td>
</tr>
<tr>
<td>(3) Introduction of managerial control instruments</td>
<td></td>
</tr>
<tr>
<td>(4) Adoption of an analytical accounting system</td>
<td></td>
</tr>
<tr>
<td>Social security and pensions agencies</td>
<td></td>
</tr>
<tr>
<td>(1) Introduction of the accrual accounting system by accounts and cost centers, side by side with the financial accounting</td>
<td>1999 and 2003</td>
</tr>
<tr>
<td>(2) Breakdown by accountability centers</td>
<td></td>
</tr>
<tr>
<td>(3) Introduction of cost centers within the accounting system (adoption of an analytical accounting system)</td>
<td></td>
</tr>
<tr>
<td>(4) Introduction of managerial control instruments</td>
<td></td>
</tr>
</tbody>
</table>

*Note.* Source: Our elaboration.

The pillars of the 2009-2010 public accounting reform are the coordination of public finance and the harmonization of the accounting systems, as well as the implementation of measures addressing the public spending transparency and controllability.

The institutional framework of the reform is characterized by the political and administrative decentralization and by the need to coordinate the State functions with such international bodies as the United Nations and the European Union that make reference to the IPSAS standards.

This has led to the definition of measures addressing the public accounting reform, new rules concerning the financial sustainability of the laws, the harmonization of the accounting systems and the redesign of the public finance control systems.

The reform of the national budget structure has foreseen the change of the budget planning cycle, in term of missions (34) and spending programs (164) related to quantified and measurable objectives and specific result indicators.

The process provides also for the transition from the mixed accrual-and cash-based budget to the cash budget alone, together with the gradual extension of the cash budget application to all the public administrations.

The adoption of new comprehensive accounting standards is likely to allow the consolidation and the monitoring of the PA accounts.

Furthermore, the adoption of a national budget based on missions and programs is coherent with the economic and functional classification of the European Union (national and relative satellite accounts).

Besides, State, Regions and local governments are requested to adopt consolidated budgets with information on their public local agencies and companies.

Further indications relate to the definition of a system of performance indicators as well as the more
detailed identification of the financial planning documents.

As a result, the public finance and public accounting reform may represent a relevant prerequisite for the introduction and dissemination of the IPSAS accounting standards.

Some authors (Bergmann, 2008) have underlined the convergence between the accrual accounting systems, referred to the IPSASs and the GFS (Government Finance Statistics, version 2001 GFSM2001), and connected with the SNA (System of National Accounts).

Two aspects require special attention; the model of implementation of the new reform law, consistent with top-down logics and less interested to the specificities and peculiarities of the system of the Italian Public Administration.

The introduction and enforcement of the accounting and administrative innovation requires institutional and administrative capabilities in term of strategic coordination, management and governance of 10.418 public organizations and agencies, operating in many sectors of interventions and with a high degree of diversification (D’Autilia, Ruffini, & Zamaro, 2009).

A relevant mismatching between the GFSM2001 and the accrual accounting standards is represented by the consolidation of the balance sheets of Municipalities and Provinces that emerge more and more as the key public stakeholders of a network of public organizations, agencies and enterprises delivering services to the their communities.

Eight thousand Italian municipalities control nearly 1,500 entities, including local public enterprises, quangos, local agencies and private public partnerships.

In fact, there are many statements in the reform law, from the formulation of consolidated balance sheets to the setting up of a “national data base” of the public administration.

The Transition Towards the IPSASs and the Proposed Model of Change

The IPSASs may represent a reference point, a “good accounting practice” that should be the aim of the various PA systems, including Italian PA, at an international level (Bergmann, 2009).

However, in the Italian context, a direct application in the short-run may hardly be imagined, as stressed by a number of studies written by academics and practitioners interested in public accounting and public management issues (Mulazzani, 2008).

The application of IPSAS standards to Italian PAs depends on specific law provisions at all institutional levels; it is important to underline that the regional and local public administration enjoy full autonomy in accounting matters.

This situation, combined with strong pressures coming from the institutional political system, can facilitate the adoption of the IPSASs and requires a process of implementation based on a bottom-up model “governed by the center”.

A dirigistic and top-down model is ruled out. The introduction of the IPSASs needs special attention to the prevailing institutional and organizational culture of the PAs and, in particular, special interventions for filling the gap between the IPSASs and the basic features of Italy’s public accounting system (Anselmi, Donato, Giovannelli, Pavan, & Zuccardi, 2009; Mulazzani, 2008).

In Italy, there are considerable differences between the private and public sector in term of economic and financial statements (D’Alessio, 2008).

On the other hand, in the Anglo-Saxon countries, the accounting documents of private enterprises are closer
to an assets liabilities based approach, and this gives rise to a convergence between private and public sector.

In fact, the IPSASs were developed in contexts that differ to a considerable extent from the Italian context, (i.e., those of the United States and the Anglo-Saxon countries), where the concept of “public sector” takes on a different connotation with respect to the role played in the economic and social system.

Furthermore, the international accounting standards are based on the progressive moving from a cash-based accounting to an accrual-based accounting system.

In Italy, instead, the starting model is the financial accounting system, quite different from the cash accounting system. Furthermore, in Italy there is a clear-cut distinction between formal budget, which authorize the spending policies, and the final statements, which present the operating results.

In general, prior to embarking on the IPSAS adoption process, public organizations needs to comply with a few preliminary requirements represented by the harmonization of the accounting standards, and the choice of the type of accounting system.

Besides, public organizations need to pay the utmost attention to the value of both the analytical accounting and the strategic and operational management control, as well as to the organizational aspects (human resources, information systems).

With reference to the specificity of the Italian context, it is better to adopt a two stages approach for the introduction of the IPSAS standards. The initial phase is devoted to a redefinition of the accounting system, the design of the processes/procedures and the rethinking of the organizational aspects. This initial phase should be followed by the implementation phase, with the start-up of pilot projects in given types of public administrations. The assessment of success and difficulties resulting from the pilot projects allows developing a path for the further implementation of the IPSASs.

The IPSAS adoption process requires the harmonization of the standards in terms of homogeneity of the administrative-accounting regulations for all the PA levels (State, Regions, and Local Governments).

The harmonization of the accounting systems at the various government levels is a prerequisite in order to enhance the transparency of the decision-making processes and the coordination of public finances, as well as to overcome the fragmentation of the regulatory framework.

There are still substantial differences in the criteria for drawing up forecast-type budgets and appropriation accounts, with considerable difficulties in the accounts consolidation operations.

To-date, the accounting practices are quite heterogeneous, given the coexistence of financial accounting for planning purposes, accruals accounting for reporting purposes, cash accounting for the requirements coming from the EU (SEC95).

The considerable lack of homogeneity is matched by a weakness in the financial planning and management and in the accounting systems of quite a few Italian public organizations.

Notwithstanding the public accounting reform process above mentioned, there are still relevant information needs in term of managerial and social accountability, in line with institutional decentralization and fiscal federalism.

The processes leading to the liberalization and privatization of the local public services, together with the development of public/private partnerships, require a quick and deep redesign of the public accounting systems.

Therefore, has becoming more and more urgent he transition from the current situation towards the introduction and dissemination of diffusion of public accounting documents, aligned with the new accounting standard. In this general framework the IPSASs could facilitate the harmonization of the accounting models.
The convergence between Italian PA financial management with the financial management of the PAs of other advanced countries represents a priority and could probably reduce the discretion of many public organizations in the formulation of the financial reports and performance reports. The changes in accounting systems could play a relevant role in term of strengthening the strong impact on the quality of the decision-making process at both levels, political and technical–administrative.

The choice of the reference accounting principles must be based on the use of a dual accounting system (financial and accruals-based), systems that need to be differentiated with regards to planning, programming and control systems of the various public organizations.

An integrated system based on the financial statement integrated by an economic-type accounting and balance-sheet structure allows meeting a variety of requirements, from the authorization to the spending processes, besides highlighting management costs, and monitoring and assessing the economic-patrimonial effects of the investment policies of the PA.

The implementation scenarios course proposed for the adoption of the IPSAS takes into account the requirements on contextualization through the formulation of a set of specific standards for the different types of PAs.

To-date (April, 2010), Italy has at its disposal just the standards of the Unit Monitoring the Finance and Accounting of Local Governments, which are general and not discretionary standards referred to the local PAs.

The currently available set of IPSAS standards do not include a full specificities of the PA at the level of both the budget documents (balance sheet and income statement) and the evaluation criteria.

A few significant steps need to be complied with in the proposed IPSAS process of adoption course, including in particular the review of the arrangement to classify revenue and expenditure in public budgets, based on a redefinition of input/sector of intervention classification and the classification and the introduction of a new planning system.

Other important milestones of the proposed course are the design of new auditing and internal control processes and systems, and the final consolidation of the systems to evaluate the performance results of public managers and employees.

There are additional important measures, including the strengthening of the analytical and managerial accounting systems and the redefinition and fine tuning of planning and control systems.

The review of the analytical accounting system allows the strengthening of the managerial accounting systems and eases facilitates the connection between the economic and the operational aspects of the management. A critical role leading role is played by the performance assessment parameters, based mainly on financial aspects and cash limits.

The review of the planning and control system allows an effective link among strategic and operational management control and evaluation of results.

In its turn, this allows the correlation between objectives/plans and resources, and the identification of indicators suitable for decision-making and control purposes.

At present, the forecast budget document contains just financial information and is broken down into spending ceilings by balance-sheet item (Basic Forecasting Units in the central and regional administrations). Furthermore, the revenue and expenditure estimates entered in the budget are based on an incremental logic that is not connected with the activity plans.

An important activity to be provided for in the process is represented by the measures addressing...
personnel training and the development of suitable skills through outside contributions as well as comparison and benchmarking initiatives.

We clearly need to get to know survey and coordinate a series of intangible resources, such as knowledge, skills and information if we are to understand the impact of these resources on the accounting system design arrangements.

In fact, the public administrations do not always have the expertise required to handle accounting tools based on standards and logics other than the traditional ones.

Quite often, it turns out that the managerial and operational training programs are not stimulated and the performance evaluation models are not sufficiently widespread.

If we are to adopt the IPSAS standards, we definitely need to see to the definition of a managerial development and training model with a view to developing adequate skills and harmonizing professional competences and personnel behaviors.

What is really indispensable is a cultural change in the PA decision-makers who are requested to work according to the strategic and operational logics peculiar to public management.

Besides, the approach being used provides for the adjustment and development of information systems capable of supporting the higher level of administrative, complexity consequent to the introduction of the accrual-based accounting and new planning, programming and control systems.

The difficulty of finding suitably specialized resources within public entities calls for the recourse to training supports in the management of the relations with the IT vendors and a study on the functional requirements of the IT applications with a view to integrating the planning, accounting and analytical accounting processes.

Table 3
A Likely Approach to the Introduction of the IPSASs in the Italian Context

<table>
<thead>
<tr>
<th>Presuppositions/intervention areas for the start-up of the ipsass adoption course</th>
<th>Start up of the pilot project for local and central governments</th>
</tr>
</thead>
</table>
| Harmonization of regulations | (1) Standardized administrative-accounting regulations for all the PA levels (State, Regions, Local Governments)  
(2) Uniform classification schemes and accounting principles for the PA |
| | (1) Review of the accounting model, implementation of new processes/procedures and organizational aspects (implementation of the human resources training plan, realization of the information system functionalities) with respect to pilot local and central governments  
(2) Impact evaluation |
| Contextualization of the IPSASs | (1) Finalization of the IPSAS issuing process  
(2) Definition of a set of specific principles for the individual PA compartments |
| | Implementation of the accounting model with respect to other entities |
| Definition of the reference accounting document | Dual (financial and accrual-based) accounting system, integrated by planning, programming and control systems |
| | Implementation of new processes/procedures and organizational aspects with respect to other entities |
| Review of the processes, procedures and organization | (1) Definition of new systems and processes for planning, programming and control, management accounting, auditing and internal control purposes  
(2) Personnel training and development of adequate skills  
(3) Adjustment and development of information systems |
| | Implementation of the IPSAS accounting principles with respect to other entities |

Note: Source: our processing of data.
Finally, the implementation phase provides for the start-up of pilot projects to test the hypothesized course on local governments and central administrations, with the consequent redefinition of the accounting model, the redesign and reengineering of processes/procedures and organizational innovation measures (development of adequate skills with respect to human resources, realization of the functionalities of the information systems) in the pilot entities (see Table 3).

The evaluation of the impacts of the initial application allows using the new reference accounting model, the new processes/procedures and the personnel training program in different public administrations/entities, with the consequent implementation of the IPSAS accounting standards.

**Initial Empiric Verification and Preliminary Conclusions**

As previously pointed out, the implementation course has been critically debated within the context of an initial empiric verification that involved the Chief Financial Officers (CFOs), that is, those in charge of the financial programming and management in the Municipalities and Provinces of the Lazio Region.

This empiric verification has been carried out based on two different operations:

1. Individual interview to understand the actual knowledge on the new accounting standards and the perception on the potential impact of IPSASs in terms of improvement of the economic-financial management of each individual local government and the local public entity, and the non-economic performance dimensions;

2. Adoption of a simplified Delphi, with the participation of all the respondents (8), with a view to understanding the best alternatives for IPSAS communication and diffusion purposes as well as for IPSAS-based training.

The decision to involve just a few small-medium sized Municipalities (from 30,000 to 100,000 inhabitants) and Provinces has led to the exclusion of the Rome Municipality and the Rome Province.

Predictably, the CFOs of the local governments were found to have medium-low knowledge of the said standards, while the CEOs and the political decision-makers were fully unaware of them.

Subsequently the CFOs being interviewed have pointed to the potential expediency of the IPSASs in terms of improvement of the information about the economic-financial management of local public entities but, according to them, the anticipated positive impact dropped to a considerable extent when considering the non-economic performance dimensions and the economic-financial information relative to individual Municipalities.

What resulted from the Delphi application proved quite interesting. Considering the alternative communication strategies, the possibility of entrusting the communication measures at an institutional level (Ministry of Economy and Finance, joint organizations), according to top-down logics, met on average with consent.

Total agreement was reported with respect to the effectiveness of training measures addressing the CFOs and the intermediate managers of the economic-financial sectors, as well as the activation of professional communities and the horizontal dissemination of knowledge.

Hence, the Delphi application has given rise to conflicting indications: considerable agreement with respect to top-down logics entrusted to the central administrations in terms of institutional communication and training towards logics of horizontal dissemination of knowledge based on cooperation and exchange of information.

Therefore, according to the CFOs of medium-small Municipalities in the Lazio Region, the IPSAS enforcement strategy swings between the “forced” or dirigistic model and the spontaneous model.

In conclusion, it should be stressed that there are quite a few economic and political reasons that call for the creation of a single system of accounting standards or an accounting language in the Italian PA, including
in particular:

(1) The progressive consolidation of the new public financial management (NPM) and the move from the cash-based to the accrual-based accounting;

(2) The widespread tendency towards processes for the standardization of behaviors and practices in public administrations (the harmonization at both a European Union and an international level);

(3) The process of liberalization and privatization of local public services, together with increasingly more widespread forms of cooperation between the public and the private sector;

(4) The growing inner and outer accountability requirement (qualified information to stakeholders), together with the need for more incisive controls on the part of the institutional control organizations;

(5) The need to allow the comparison and comparability of services costs and data among both different entities and different countries, therefore, giving rise to data benchmarking and process benchmarking practices.

The challenges, of which political decision-makers, public managers and chief financial officers are well aware, that face the process leading to the introduction and diffusion of the accounting standards are connected, first of all, with the design of the training courses that are to develop the skills required to handle accounting tools based on principles and logics that differ from those entrenched in the public sector.

Other important challenges are represented by the need for a specific declension of the IPSASs for the different typologies of PAs, and the awareness of the central role to be attached to performance evaluation and performance management, which are increasingly more crucial for the action of the PAs at an international level.

References


Consumer Trust—Challenge for E-Healthcare

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The evolution of internet within last years and continuous advances in electronic commerce and communication provide exciting opportunities to implement powerful framework of resources, tools and applications that revolutionize way in which healthcare institutions interact with their patients, as well as deliver and manage medical services. Internet-based healthcare is application of information and communication technologies across the whole range of healthcare functions. It covers everything from electronic prescriptions and computerized medical records to the use of new systems and services that cut waiting times and reduces data errors. Development and implementation of web-enabled communication, patient services and other e-health initiatives are increasingly important to maintaining competitive advantage and to compete for market share. More importantly, value added for patients by facilitating access to information and resources is expected to improve quality of services, speed of treatment and potentially to rationalize management of administrative processes. However, introductions of such e-healthcare services into market can be successful on condition that customers will recognize all these advantages and have trust in organizations provide these e-services. In this paper authors will concentrate on customer trust as key factor determining success of e-healthcare. The purpose of this study will determine character and power of trust placed by customers in e-healthcare, and to identify factors influencing customers trust to e-healthcare. Authors have ventured thesis that customer trust to e-healthcare is high as consequence of even higher customer satisfaction with traditional healthcare services and great customer trust in traditional healthcare institutions.

Keywords: customer trust, e-healthcare services, Polish healthcare market

Introduction

Internet technologies are the most popular means of communicating with other people, gathering information, purchasing goods and exploring services. Over the past decade, the number of studies about the internet has grown dramatically. Some of them focus on particular websites, while others concentrate on the use of the internet by particular social groups. In this article the authors want to focus on medicine sector, which is very important for all humans. This sector uses also the internet as a tool for creating virtual organizations and providing services for customers. Moreover, customer trust is one of the crucial factors in the development of medicine service sector. The development of the internet and the World Wide Web (WWW) has provided a new area and tools for the development of more flexible services for medical (not only administrative) applications. New possibilities are used for the creation of internet-based signal analysis, decision support and marketing activities, as well as virtual organizations. Nowadays, customers have easy access to e-services.
However, the introduction of such services into the market can be successful on the condition that customers are satisfied with the offered services and have trust in them. The purpose of this study is to identify the trust placed by customers in e-health services and to identify factors influencing customers trust to e-healthcare.

**Conceptual Background**

The growth in e-services has been stupendous over the last few years. Consumers are becoming more willing to use e-services, which opens up a completely new area of activity and competition for companies offering these types of services. Hence, the question arises: What influences consumer purchase decisions and what is the role of trust in the whole process?

One of the major differences between Business-to-Consumer internet-based services (B2C e-services) and the more traditional types of customer services is that websites of e-services frequently lack the social presence of the physical services. This lack of a social presence may impede the growth of B2C by hindering the development of customer trust in the service provider. Human interactions or at least that belief that the system has the characteristics of social presence is believed to be critical in the creation of trust. Trust itself is a major issue affecting the phenomenal growth rate of e-commerce, according to industry sources and recent academic studies (Gefen & Straub, 2003). Trust is a prerequisite of many business interactions (Dasgupta, 1988) because of the way it reduces the uncertainty that is created by dependency on others (Luhmann, 1979). Trust is especially important in an online environment when all that consumers have to go by is a computer system embedded in web pages (Gefen & Straub, 2003).

Trust is an important aspect in commerce, in general, because of the inherent uncertainty created by the need to depend upon others in many types of commerce interactions (Fukuyama, 1996; Luhmann, 1979; Williamson, 1975) and the resulting possibility of encountering opportunistic behavior, such as vendors not candidly revealing all the appropriate risks (Williamson, 1975) or behaving in an unpredictable manner (Luhmann, 1979). The same applies to e-commerce, wherein consumers need to depend upon often unknown e-vendors who may resort to opportunistic behavior (Gefen & Straub, 2003).

The presented study examines consumer trust with reference to use of e-service websites. Healthcare sector was chosen as subject of analysis. This choice was deliberate, as, on the one hand, the focus was put on sector characterized by great resource asymmetry in the relation: Business to Customer (B2C); on the other hand, authors wanted to concentrate on sector which has required degree of concentration, frequency of customer-organization contacts and customers’ freedom in the choice of a service provider.

The evolution of the internet within last years and the continuous advances in electronic commerce and communication provide exciting opportunities to implement a powerful framework of resources, tools and applications that revolutionize way in which healthcare organizations interact with their patients, as well as deliver and manage medical services (Nazi, 2005). Internet-based healthcare is application of information and communication technologies across whole range of healthcare functions. It covers everything from electronic prescriptions and computerized medical records to the use of new systems and services that cuts waiting times and reduce data errors. Internet-benefits management promises to simplify and reduce costs for employers and bring more choices and control. The development and implementation of web-enabled communication, patient services and other e-health initiatives are increasingly important to maintaining a competitive advantage and to compete for market share. More importantly, the value added for patients by facilitating access to information and resources is expected to improve the quality of services, speed of treatment and potentially to rationalize
According to character of their activity, all Healthcare Organizations (HCOs) offering services through the internet can be divided into (Chmielarz, 1999):

1. Internet HCOs with traditional outlets—they use internet as alternative distribution channel; patients have access to services in traditional branches, through the internet and other electronic channels (Model I);
2. HCOs operating only by means of internet—these are virtual HCOs without traditional branches, patients have access to services only through the internet or other electronic channels (Model II);
3. Internet HCOs created by traditional HCOs but operating separately—there is no relation between services offered through internet and traditional branches (Model III).

Nowadays HCOs which offer services in traditional branches and support their activities with internet (Model I) are most popular on Polish market. They have competitive advantage in market compared to other HCOs because they have already been operating with big number of patients (mostly loyal ones). Model II has a complementary role in market, whereas Model III is less popular and constitutes transitory form of internet organization.

There are many definitions of e-health. Nevertheless, it can be assumed that e-health is emerging field at intersection of medical information technologies, public health and business. E-health refers to health services and information delivered or enhanced through internet and related technologies (Eysenbach, 2010). The growth of e-health systems is related to evolution of the internet. As internet is becoming more widespread, friendlier and faster, the range of its uses is widening (Kosinska & Slowikowski, 2004).

The development of e-health in academia is scarce and is new issue for discussion and analysis (Alvarez, 2003). It offers means to draw together governments, organizations and professionals in collaborative partnerships in ways that were not possible before. For instance, e-procurement has helped many companies reduce their procurement costs while increasing their supply chain performance, and ultimately, their overall performance (Quesada, 2004). Numerous stakeholders, including consumers, clinicians, administrators and politicians, are already actively involved in e-health initiatives (Alvarez, 2003). E-health facilitates primary and community care and provides information on conditions which require immediate emergency treatment via virtual clinics. Also, e-health has the potential to supplement traditional delivery of services and channels of communication in ways that extend the HCO managers’ ability to meet patient needs. Benefits include enhanced access to information and resources, empowerment of patients to make informed healthcare decisions, streamlined organizational processes and transactions, as well as improved quality, value, and growing patient satisfaction. However, a diverse array of factors affect the development and implementation of e-health initiatives and applications (Nazi, 2005), including teleradiology, telepsychiatry, telepathology, teledermatology or home telecare.

**Research Model and Hypotheses**

In a later part of the paper the authors focus on medical organizations representing Model I, where internet organizations are combined with traditional outlets. These use internet as alternative distribution channel and consumers have access to services in a branch, through the internet and through other electronic channels. Models II and III are treated as fully VOs. The notion of trust is considered with reference to the analyzed model (Model I).

In such a structure, with its variety of historical and new ties, the antecedents for trust-building behaviors are based on a common belief that individuals or groups will act in good faith to fulfill commitments, demonstrate honesty in negotiations and refrain from excessively taking advantage (Cummings & Bromiley, 1996). Additionally, the need to rely on a variety of artificial communication media can affect the process and
form of confidence in members within the network. Moreover, it is possible that remoting workers’ expectations will be more personal and idiosyncratic—being constructed in a social vacuum—as they will be isolated from the usual benchmarks of the conventional organizational structure, relationship and practice (Crossman & Lee-Kelley, 2004).

While there is an abundance of literary works on trust in sociology, psychology, management and even journals of economics, relatively little is specifically related to organizations with atypical structures and spatial-temporal relationships. In this study the authors concentrate mainly on customer trust. The customer seeking to engage in a commercial relationship with a business initially has a positive predisposition, which is a result of the combination of three constructs: disposition to trust, institution-based trust and initial trust beliefs. The customer has a general propensity to trust others stemming from personality and cultural factors (disposition to trust), enhanced by the perceived propriety of the condition (institution-based trust). In addition, the customer has initial trusting beliefs that have been formed through the transference process with information conveyed from third parties (Papadopoulou, Andreou, Kanellis, & Martakos, 2001).

Literature studies prove that trust is determined by an array of other factor groups. Very important group relates to attributes of an organization (a traditional form of functioning) offering e-services and comprises factors such as reputation of an organization or its perceived size (Jarvenpaa, Tractisky, & Vitale, 2000). Another group refers to experiences with previously purchased services (traditional) and includes the level of satisfaction and trust (developed as a result of previous contacts with a definite organization).

The latter part of the paper is focused on this factor group and on the analysis of the factor’s influence on the level of trust in organizations providing e-services. The experience in the use of services which were previously provided by traditional organizations, especially institutions of public confidence such medical institutions, has a considerable influence over the level of trust in these organizations and guarantees purchase of services provided by these institutions. It should be borne in mind that the gained trust determines both the level of perceived risk connected with the purchase of e-services and the degree of consumer loyalty. From this point of view, trust is considered to be a necessary mediating variable between satisfaction and customer loyalty (Morgan & Hunt, 1994). Morgan and Hunt (1994) reported that trust and commitment are key mediating constructs in successful relationships. Interestingly, several researchers have also found a positive relationship between trust and satisfaction (Gummerus, Liljander, Pura, & van Riel, 2004; Hocutt, 1998; Taylor & Hunter, 2003). This finding can also be explained by other research into value, where trust in a service provider reduced the perceived level of risk, resulting in an increase in perceived value, and consequently in greater satisfaction. The research also shows a significant and positive relationship between postcomplaint satisfaction and trust, emphasizing the central role of satisfaction with conflict handling in the promotion (or reduction) of trust between the parties involved (Tax, Brown, & Chudashekaran, 1998). This is due to the notion that, when a consumer perceives a company’s performance as fair and satisfactory, his/her feelings of trust (in the company) tend to be strengthened. Based on this logic, the following are proposed:

H1: Consumer’s satisfaction with e-healthcare services is positively related to his/her trust in e-healthcare organization.

Several studies have also shown a favorable effect of customer trust in traditional organizations (firms) on customer trust in VOs (Otto, 2003; Dado, 2003; Karcz & Bajdak, 2005). This is connected with a brand value which is based on strong and unique brand associations related to attributes and benefits of service and/or corporate values (Biel, 1992; Keller, 1993; Aaker, 1996) or the perception of a company as being innovative
and dynamic (Wijnholds, 2000; Kalkman & Peters, 2003). This brings us to this hypothesis:

\[ H_2: \text{Consumer's trust in a traditional healthcare organization is positively related to his/her trust in in e-healthcare organization.} \]

Some researchers have reported that trust is not directly related to loyalty (Sirdeshmukh, Singh, & Sabol, 2002; Hocutt, 1998), but others say that trust is regarded as a precondition for an increased relationship commitment (Miettila & Moller, 1990). High satisfaction can lead to high trust in a service provider, but without the involvement of any emotional commitment. While trust is necessary for an increased relationship commitment, trust by itself is no guarantee of repeat business or loyalty. This implies that mere trust in a service provider is not sufficient to increase one’s commitment to a particular organization. There must be something that mediates the relationship between trust and relationship commitment. The consumer can trust that an organization will do what it says, but still may not be loyal to that particular organization. At the same time, several studies have demonstrated the effect of satisfaction on customer loyalty (Loveman, 1998; Brown, Cowles, & Tuten, 1996; Croin & Taylor, 1992; Rust & Zahorik, 1993), and brand trust is postulated to affect customer loyalty directly, in the absence of effects on a satisfaction construct (Moorman, Deshpande, & Zaltman, 1993; Garbarino & Johnson, 1999; Gommans, Krishnan, & Scheffold, 2001). This leads us to propose the following:

\[ H_3: \text{Consumer's satisfaction with healthcare services positively influences his/her loyalty to e-services.} \]
\[ H_4: \text{Consumer's trust in e-healthcare services is positively related to his/her loyalty to e-services.} \]

Given the theoretical background and established hypotheses, Figure 1 presents a theoretical model for investigating customer trust in virtual organizations in healthcare sectors.

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**Figure 1.** A hypothesized model of consumer trust in e-healthcare.

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**Research Methods**

In order to empirically test the hypothesized model of consumer trust in e-healthcare services a survey was conducted with the use of a structured questionnaire. The questionnaire was designed with the use of a Likert scale which referred to individual factors included in the model of trust in e-healthcare services. Scales to measure each factor in the model were developed on the basis of previous literature, and where possible, the already existing scales were used. In particular, measures of consumer satisfaction were based on three items...
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(Croin & Taylor, 1992; Bitner, 1990; Wirtz, 2001), six items of consumer trust each for traditional and virtual healthcare service organizations (Sirdeshmukh, Singh, & Sabo, 2002; Doney & Cannon, 1997; Price & Arnould, 1999; Andreassen & Lindestad, 1998), and finally four for consumers loyalty to e-healthcare organization (Zeithaml, Berry, & Parasuraman, 1996). After the questionnaire preparation, the measurements were submitted for evaluation by three experts—marketing and statistic professors—in terms of wording/meaning and consistency (see Appendix).

The survey was conducted in Poland, which is a representative model for transforming countries in Europe (Kedzior & Karcz, 1998). The research was carried out on a sample of respondents selected by means of a quota-sample method-assumed quotas included age and education (Matysiewicz, 2005). The survey comprised 600 adult respondents. After the collection, all questionnaires were subject to screening and verification. As a result, 587 questionnaires were approved for further analyses.

Further on, the construct validity of model scales was evaluated by means of the Confirmatory Factor Analysis (CFA) of the pooled data from seven aspects. The CFA was conducted with AMOS ver. 3.6 (Arbruckle, 1997). The Chi-square value was significant (Chi-square=602.272, df=89, p<0.001), which might be an artifact of the sample size, thus other fit indexes are more indicative. Table 1 presents common fit indexes, guidelines regarding the index recommended values and index values for CFA models. The indexes show a good overall fit to the data.

Table 1
Goodness-of-Fit Statistics for Research Model

<table>
<thead>
<tr>
<th>No.</th>
<th>Goodness-of-Fit Statistics</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$\chi^2$</td>
<td>602.272 (p&lt;0.001)</td>
</tr>
<tr>
<td>2</td>
<td>DF</td>
<td>89</td>
</tr>
<tr>
<td>3</td>
<td>GFI</td>
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<tr>
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<tr>
<td>6</td>
<td>NFI</td>
<td>0.969</td>
</tr>
<tr>
<td>7</td>
<td>RMSEA</td>
<td>0.069</td>
</tr>
</tbody>
</table>

For construct validity, the authors examined the factor loadings of model variable items on their underlying constructs. The loadings of 12 of the 19 model variable items were above 0.7. Three other model variables had loadings of 0.6, again indicating a good fit of the measurement model (Chin, 1998). The loadings of other variable items—“I trust this healthcare institution keeps my best interests in mind”, “I find it necessary to be cautious with this healthcare institution”, “This e-healthcare institution has more to lose than to gain by not delivering on their promises” and “I do not want to use services of other e-healthcare institution” —were under 0.5. Therefore, these variable items were removed from further analysis.

Main Results and Discussion

The hypotheses were subjected to examination basically by levels of adjustment of the theoretical model and by the significance and magnitude of estimated regression coefficients (Hair, Andreson, Tatham, & Black, 1998; Gatnar & Walesiak, 2004).

The results provide support for all four homological relationships specified in our theoretical model. These relations reflect the impact of (1) satisfaction with e-healthcare services on trust in e-healthcare
CONSUMER TRUST—CHALLENGE FOR E-HEALTHCARE

institutions, (2) trust in traditional medicine institutions on trust in e-healthcare institutions, (3) satisfaction with e-healthcare services on loyalty to e-healthcare institutions, (4) trust in e-healthcare intuitions on loyalty to e-healthcare institutions.

The results confirm hypotheses H1 and H2, according to which consumer satisfaction with e-healthcare services and consumer trust in traditional healthcare institutions have effects on trust in e-healthcare institutions. In addition, Table 2 shows the explained variation ($R^2$) for each dependent variable in the model. An $R^2$ of 0.82 indicate that two constructs—satisfaction and trust in traditional healthcare institutions—greatly determine the variation in consumer trust in e-healthcare institutions. However the trust in traditional healthcare institutions has a stronger impact on trust in e-healthcare than satisfaction (0.7 and 0.61). The findings support hypotheses H3 and H4, according to which consumer satisfaction with e-healthcare institutions and consumer trust in e-healthcare have an impact on consumer loyalty to e-healthcare. An $R^2$ of 0.71 suggest that two constructs—satisfaction and trust—determine variations in consumer loyalty to e-healthcare. The impact of trust in e-healthcare (0.79) on consumer loyalty results in consumers’ belief that the institution will have a consistent and competent performance in future.

Table 2

<table>
<thead>
<tr>
<th>Estimated Coefficients in Consumer Trust to E-Healthcare Organization Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relationship in model</td>
</tr>
<tr>
<td>Dependent variable:</td>
</tr>
<tr>
<td>Customer trust to e-healthcare</td>
</tr>
<tr>
<td>- Satisfaction with e-healthcare services</td>
</tr>
<tr>
<td>- Trust to traditional healthcare institution</td>
</tr>
<tr>
<td>Dependent variable:</td>
</tr>
<tr>
<td>Consumer loyalty to e-healthcare</td>
</tr>
<tr>
<td>- Satisfaction with e-healthcare services</td>
</tr>
<tr>
<td>- Trust to e-healthcare institution</td>
</tr>
</tbody>
</table>

Notes: $^a$: estimates presented come from ERLS using EQS; $^b$: t-values in parenthesis. Based on one-tailed test: $t$-values>1.65, $p<0.05$; $t$-values>2.33, $p<0.01$. Coefficients in bold are statistically significant.

Implications and Directions for Future Research

The study results support both the model presented in Figure 1 and the hypotheses regarding the directional linkages between the model variables. The research shows that customer trust in e-healthcare in Poland is high. This high level of trust in e-healthcare institutions is a consequence of the even higher level of customer satisfaction with e-healthcare and great trust in traditional healthcare institutions. It should be emphasized that the level of consumer trust in traditional healthcare institutions is higher in comparison to e-healthcare service providers. This is due to poor market education and a less developed virtual market in Poland. It is also worth underlining the fact that customer trust in e-healthcare institutions and customer satisfaction with e-healthcare services are positively related to customer loyalty.

Bearing in mind the above-presented facts, it can be concluded that the model holds for e-healthcare services sector. From the academic point of view, our research examines some relevant issues in the field of the considered knowledge. These issues concern, among others, the role of trust in traditional healthcare institutions in creating trust in virtual ones and the importance of the notion of trust as an antecedent of loyalty to e-healthcare institutions. From the managerial perspective, the present study brings several contributions to
marketing professionals. The findings of this study indicate that e-healthcare institutions have successfully focused on the creation and maintenance of long-term relationships, implied in the treatment of consumers. The investments made to increase consumer trust in traditional healthcare institution will also enhance consumer trust in e-healthcare institutions and will strengthen the relationship between consumers and service companies.

Nonetheless, it should be remembered that this research has some limitations, which, however, can be turned into opportunities for future research. The key limitation of this study refers to the choice of healthcare sectors, which are characterized by the highest level of customer retention and the greatest involvement on the part of consumers. Apart from that, the authors have taken into consideration a limited number of determinants of trust in e-healthcare. Other determinants (cognitive or affective) or moderating variables can also influence this trust in e-healthcare. Moreover, trust in e-healthcare may include aspects other than those considered in this research. In addition, the research was conducted only in Poland, which constitutes a representative model for country in transition. Trust in e-healthcare may be different in other countries. We believe that the future focus on a different service context and on the role of various determinants, as well as on cross-country population, will contribute to a better understanding of trust in e-healthcare.

References

CONSUMER TRUST—CHALLENGE FOR E-HEALTHCARE


Items/scales of the model variables and control variables for healthcare organizations

Trust to traditional healthcare services organization:

T1. This healthcare organization is trustworthy
T2. This healthcare organization wants to be known as one who keeps promises and commitments
T3. I trust this healthcare organization keeps my best interests in mind
T4. I find it necessary to be cautious with this healthcare organization
T5. This healthcare organization has more to lose than to gain by not delivering on their promises
T6. This healthcare organization’s behavior meets my expectations

Customer satisfaction with e-healthcare services:

S1. E-services of this healthcare organization meets my expectations
S2. This healthcare organization offers the highest quality e-services
S3. I use e-services with pleasure in this healthcare organization

Trust to e-healthcare services organization:

V1. This e-healthcare services organization is trustworthy
V2. This e-healthcare services organization wants to be known as one who keeps promises and commitments
V3. I trust this e-healthcare services organization keeps my best interests in mind
V4. I find it necessary to be cautious with this e-healthcare services organization
V5. This e-healthcare services organization has more to lose than to gain by not delivering on their promises
V6. This e-healthcare services organization’s behavior meets my expectations

Customer loyalty to e-healthcare services organization:

L1. I’m going to use services of this e-healthcare services organization in future
L2. This e-healthcare services organization is worth to recommend to other consumers
L3. Nothing is going to push to change this e-healthcare services organization
L4. I don’t want to use services for other e-healthcare services organization
Six Sigma: The Panacea to Sustainability*

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Whilst there are a number of qualified methodologies, the researchers have opted to utilise the tools available through Six Sigma to prove that Six Sigma can be used to save resources and improve quality and process. Five industry sectors were identified as the ones to be surveyed using quantitative and qualitative methods and finally piloting the results on five different SMEs. Since this is a relative new methodology to the Cypriot entrepreneur and regrettably at the time of carrying out the study an international financial crisis caused a lot of financial problems to many respondents and as such could not see the immediate effects or benefits of Six Sigma and were reluctant to co-operate or participate. The Six Sigma methodology can be customized to industrial sectors and a tailored version of the methodology can be developed for a particular process or problem. The paper illustrates the problem areas identified from both the qualitative and quantitative research per industry. This is the first study carried out on Six Sigma in a small economy like Cyprus and tested on five industry sectors using both qualitative and quantitative methods.

Keywords: Six Sigma, Sigma, lean, DMAIC, ISO 9000, EFQM, TQM, SME, CAF, industry sectors, Cyprus

The global financial crisis started to show its effects in the middle of 2007 and into 2008. The world stock markets have fallen, large financial institutions have collapsed or have been bought out, and governments in even the wealthiest nations have had to come up with rescue packages to bail out their financial systems. Six Sigma is a methodology for minimising mistakes and maximising operational significance. Ultimately mistakes have a cost, a lost customer, the need to repeat in undertaking an activity, a part that has to be replaced, time or material wasted, efficiency lost, or productivity squandered. In fact, waste and mistakes cost many organisations as much as 20 to 30 percent of their revenue. In other words it has been defined as a measure of the quality of products and services, a philosophy and a process. Higher product quality is measured by higher “σ” ratings and Six Sigma uses a range of tools to achieve quality. It is disciplined, data-driven approach and methodology for eliminating defects in any process. Defects and lost customers have serious repercussions for a company particularly during economic crisis. The question however is how acceptable would such a methodology be in a small economy by SMEs?

Literature Review

During the 1990s, Total Quality Management (TQM) was the dominant theoretical and empirical paradigm for quality management and included many elements advocated by leading quality thinkers such as Deming (1986, 1994), Juran (1989) and Crosby (1979). Some argued that Six Sigma is the latest banner of TQM

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SIX SIGMA: THE PANACEA TO SUSTAINABILITY

(McManus, 1999), others disagree claiming it is something new (Pande, Neuman, & Cavanagh, 2000). Schroeder, Linderman, Liedtke and Choo (2007) have carried out an extensive comparison of Six Sigma and TQM. They conclude their comparison by saying that “what is being done in Six Sigma is not entirely new with respect to prior quality tools or principles, but the deployment approach and emergent structure of Six Sigma are new”. “The management practices and principle” offer a new structure for improvement. “The structural differences simultaneously promote both more control and exploration in improvement efforts”. Anbari (2002) went a step further and stated:

“Six Sigma = TQM + Stronger customer focus + Additional data analysis tools + Financial results + Project management.”

What Is Sigma?
Sigma is the Greek letter that is a statistical unit of measurement used to define the standard deviation of a population. It measures the variability or spread of the data.

In the world of Six Sigma companies (Ioannou, 2007), the term Sigma has to come to signify how well a business process, product, or service is meeting the requirements of the marketplace. Six Sigma has come to mean failing to meet customer requirement only 3.4 times out of a million opportunities.

What Is Six Sigma?

Six Sigma is a data-driven method focusing on the customer and the quality of the product or services provided (Islam, 2004). It is a “very basic and systematic approach based on statistical data, which provides companies with a way to reduce these uncertainties” (Lee & Choi, 2006). It is a business strategy that focuses on “improving customer requirements understanding, business systems, productivity and financial performance” (Kwak & Anbari, 2006). It is a “systematic, data-driven approach using the Define, Measure, Analysis, Improve, and Control (DMAIC) process” (Kwak & Anbari, 2006).

The definitions of Six Sigma vary from “it is a business strategy used to improve business profitability, to improve the effectiveness and efficiency of all operations to meet or exceed customer needs and expectations” (Kwak & Anbari, 2006) to being a disciplined method of rigorous data gathering and robust statistical analysis to identify sources of error and ways of eliminating them (Harry & Schroeder, 1999).

Benefits derived from the use of Six Sigma have ranged from: (1) financial outcomes resulted from cost reduction (Lee & Choi, 2006); (2) customer and employee satisfaction (Elliott, 2003); (3) business operations being more successful, with strategies being set faster and more effectively than competitors (Lee & Choi, 2006); (4) giving priority to preventive measures that remove the root cause of the defects rather than searching for defects after they occur (Rowlands, 2003); (5) standardization measurement process common (Xagoraris, 2003); (6) driving out waste and raising levels of quality (Cua, 2001); (7) no Six Sigma project will be approved unless the team determines the savings generated from it (Antony, Kumar, & Madu, 2005); (8) Six Sigma integrates human aspects and process (Antony et al., 2005), (9) Six Sigma methodology links the tools and techniques in a sequential manner (Antony et al., 2005) and (10) Six Sigma creates a powerful infrastructure for training of champions, master black belts, black, green and yellow belts (Adams, Gupta, & Wilson, 2003).

Motorola developed Six Sigma in 1987 in an effort to reduce defects (Barney, 2002). Companies which have used the Six Sigma methodology ranged from Ford, Honeywell and American Express (Hahn, Doganaksoy, &
Companies have estimated the financial benefit of implementing Six Sigma. An example of this is General Electric which estimated in 1999 that the impact on net income derived from the implementation of Six Sigma after allowing for the cost of implementation exceeded $2 billion (General Electric Company, 1999). Kwak and Anbari (2006) provided a list of the benefits/savings derived from the implementation of Six Sigma on 15 companies (See Table 1).

Table 1
Reported Benefits and Savings From the Implementation of Six Sigma

<table>
<thead>
<tr>
<th>Company</th>
<th>Project Metric</th>
<th>Measures Benefit/Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motorola (1992)</td>
<td>In-process defect levels</td>
<td>150 times reduction</td>
</tr>
<tr>
<td>Raytheon/aircraft integration systems</td>
<td>Depot maintenance inspection time</td>
<td>Reduced 88% as measured in days</td>
</tr>
<tr>
<td>GE/Railcar leasing business</td>
<td>Turnaround time at repair shops</td>
<td>62% reduction</td>
</tr>
<tr>
<td>Allied Signal (Honeywell)/laminates plant in South Carolina</td>
<td>Capacity cycle time inventory on-time delivery</td>
<td>Up 50% Down 50% Down 50% Increased to near 100%</td>
</tr>
<tr>
<td>Allied Signal (Honeywell)/bendix IQ brake pads</td>
<td>Concept-to-shipment cycle time</td>
<td>Reduced from 18 months to 8 months</td>
</tr>
<tr>
<td>Hughes Aircraft’s Missiles Systems Group/wave soldering operations</td>
<td>Quality/productivity</td>
<td>Improved 1,000%/improved 500%</td>
</tr>
<tr>
<td>General Electric</td>
<td>Financial</td>
<td>$2 billion in 1999</td>
</tr>
<tr>
<td>Motorola (1999)</td>
<td>Financial</td>
<td>$15 billion over 11 years</td>
</tr>
<tr>
<td>Dow chemical/rail delivery project</td>
<td>Financial</td>
<td>Savings of $2.45 million in capital expenditures</td>
</tr>
<tr>
<td>Telefonica de Espana (2001)</td>
<td>Financial</td>
<td>Savings and increases in revenue 30 million euro in the first 10 months</td>
</tr>
<tr>
<td>Texas Instruments</td>
<td>Financial</td>
<td>$600 million</td>
</tr>
<tr>
<td>Johnson and Johnson</td>
<td>Financial</td>
<td>$500 million</td>
</tr>
<tr>
<td>Honeywell</td>
<td>Financial</td>
<td>$1.2 billion</td>
</tr>
<tr>
<td>Bank of America (BOA)</td>
<td>Customer Relationships</td>
<td>10.4% increase in customer satisfaction and 24% decrease in customer problems</td>
</tr>
<tr>
<td>American Express</td>
<td>Quality/productivity</td>
<td>Improve external vendor processes, and eliminate non-received renewal credit cards</td>
</tr>
<tr>
<td>The radiology film library at the University of Texas MD Anderson Cancer Center</td>
<td>Quality/productivity</td>
<td>Improved service activities greatly</td>
</tr>
<tr>
<td>University of Texas MD Anderson Cancer Center outpatient CT exam lab</td>
<td>Quality/productivity</td>
<td>Patient preparation times were reduced from 45 min to less than 5 min in many cases and there was a 45% increase in examinations with no additional machines or shifts</td>
</tr>
</tbody>
</table>


Lean Six Sigma and Six Sigma are classified as process improvement programmes, which include “process re-engineering, theory constraints and total productive maintenance” (Shah, Chandrasekaran, & Linderman, 2008). This concept dates back to the beginning of the 20th century (Taylor, 1911) and the decisive work of Ohno (1978), Shingo (1981), Deming (1986) and Shah (2006). Thus it can be used in all the industries.

Lean Six Sigma and Six Sigma have been tested in manufacturing (Shah et al., 2008; Schroeder et al., 2007; Kumar, Antony, Singh, Tiwari, & Perry, 2006; Kwak & Anbari, 2006; Lee & Choi, 2006; Mahesh, Wong, Fuh, & Loh, 2006; Antony et al., 2005; Linderman, Schroeder, & Choo, 2005); Construction (Heon Han, Jin Chae, Soon...
Whilst Six Sigma has been implemented in large and multinational organizations SMEs have experienced some resistance to implement it perhaps due to the costs involved. It appears however, and as stated by Antony et al. (2005), large organizations have left no choice on the SMEs to consider the introduction of Six Sigma strategy in order to provide high quality products and highly capable businesses processes. Harry and Crawford (2004) demonstrated the benefits of implementing white belts on SMES and creating value for customers with a savings of about $300,000 per year. Wilson (2004) identified the following advantages for small-businesses embarking on Six Sigma initiative: (1) stronger, more intimate relationships with customers, (2) fewer number of sites, (3) fewer layers in the management hierarchy, (4) faster and effective internal communication and (5) strong owner influence.

Lean production, evolved from the Toyota Production System (TPS) and its purpose was to improve firm performance through elimination of waste. Lean production can be defined as a “philosophy, as a set of principles and as bundles of practices” (Shah, Chandrasekaran, & Linderman, 2008). Womack et al. (1996) defined lean production in terms of production philosophy that eliminates waste from a product’s value-stream and shortens the time between order placement and product delivery.

Six Sigma ranges from “a business philosophy for improvement to a collection of statistical tools and metrics” (Shah et al., 2008). Schroeder et al. (2007) identified six concepts which relate to Six Sigma: (1) top management leadership, (2) customer requirements, (3) focus on financial and non-financial results, (4) structured method of process improvement, (5) strategic process selection and (6) full-time specialist. Six Sigma concentrates on performance target of operating within 3.4 defects per million opportunities.

The Difference Between Lean and Six Sigma

“Lean practices and techniques focus on streamlining processes, whereas Six Sigma practices and techniques help identify and eliminate root causes of problems” (Evans & Lindsay, 2005). Thus lean places emphasis on process flow while Six Sigma concentrates on process defects (George, 2003). Lean is a bottom up approach whereas Six Sigma plays a “more active role by selecting improvement projects based on financial and strategic goals” (Shah et al., 2008).

Obstacles and challenges of the Six Sigma methodology have varied from simply repackaging traditional principles and techniques (Catherwood, 2002) to not being the panacea to answer to all business issues (Kwak & Anbari, 2006). Of course the cost to implement such a process whilst they are less than the savings in harsh economic times it is difficult to convince that it is worth spending a few hundred thousand to save a million.

Whilst Six Sigma appears to be winning ground in developed economies and academic literature is steadily increasing on the topic non existent research appears on its use in small economies. The researchers decided to select and test the use of Six Sigma in Cyprus for the following reasons.

Firstly, Cyprus based on the World Bank Report (2007) is one of 45 small economies. Secondly it has a large percentage of SMEs (99.9% of its businesses are SMEs) \(^1\). Cypriot Micro enterprises within SMEs (those employing less than 10 persons) are 94.1%, whilst Medium size enterprises (those employing between 10-49

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\(^1\) Source: www.mof.gov.cy/mof/cystat/statistics.nsf
people) account for 5% and only 0.8% are Large SMEs (those employing 50-249). Thirdly according to the Minister of Finance on July 9, 2009, Cyprus is one of two countries in the EU 27 with a positive economic growth in the first half of 2009 (Minister of Finance on July 9, 2009).

Having therefore identified the country the research was to be carried out, the authors decided to concentrate on SMEs and on the main industries the country’s economy relied upon which are: Hospitality and tourism, construction, banking and finance, healthcare and automotive and transport.

Methodology

Given the size of the country and of the companies as well as the economic crisis being faced at the time of the research it was decided that the research questions are as follows:

1. In what process areas can Six Sigma be implemented in a small economy?
2. Is there a difference in the processes identified depending on the industry?
3. Can real financial benefits be derived from the implementation of Six Sigma in SMEs?

To enable the researchers to carry out the present study, an academic and a Six Sigma Black Belt were involved throughout the research, funding was provided by the Research Promotion Foundation of Cyprus. Having conducted an extensive literature review a generic questionnaire was developed. The researchers decided to use the Common Assessment Framework (CAF) (2006) as a basis to identify the problematic process areas. The reason CAF and not another model was used was because this particular framework is widely used by many quality officers in Cyprus. Having therefore adapted the CAF model on the needs and characteristics of a small economy the questionnaire was pilot tested on five quality managers within each of the industries. Once the questionnaire was approved by the team, it was mailed to 1000 Cypriot companies selected from the Cyprus Chamber of Commerce database. The questionnaires were mailed to the quality officer within each organization. As the database included all the members of the Cyprus Chamber of Commerce, there was no way of knowing which one of them was SMEs or not. Therefore, respondents were asked to state the number of employees and turnover or to only reply if they fulfilled the SME criteria. Over one hundred respondents replied that due to the economic crisis and that there were concerns of survivorship or staff redundancies, they were not interested in participating in this research. Additionally, many questionnaires were returned back to us because the companies had closed down.

The useful responses (ignoring incomplete questionnaires, as well as, respondents that did not qualify under the European Commission’s SME definition) were 50. Following the low response rate, it was decided to have a follow up action to the quantitative study and carry out a qualitative study as well. In the qualitative study we invited CEOs/MDs and Quality Managers of leading organizations and Government Regulators who have an influence on the market of SMEs from the five industry sectors running five different focus group meetings. This gave us an opportunity, to obtain tangible information from these individuals by operating outside the box (See Tables 2 and 3).

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2 Source: www.mof.gov.cy
Table 2

Demographics of Quantitative Research

<table>
<thead>
<tr>
<th>Position of the respondent</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Board member</td>
<td>6</td>
<td>9</td>
</tr>
<tr>
<td>Managing director</td>
<td>17</td>
<td>35</td>
</tr>
<tr>
<td>Accountant</td>
<td>7</td>
<td>15</td>
</tr>
<tr>
<td>Manager</td>
<td>20</td>
<td>41</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Type of organization</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Automotive and transport</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>Banking and insurance</td>
<td>6</td>
<td>12</td>
</tr>
<tr>
<td>Construction</td>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td>Healthcare</td>
<td>9</td>
<td>18</td>
</tr>
<tr>
<td>Hospitality</td>
<td>20</td>
<td>40</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Legal status of the organization</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private company</td>
<td>41</td>
<td>84</td>
</tr>
<tr>
<td>Public and listed on the stock exchange</td>
<td>9</td>
<td>16</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Number of employees</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;10</td>
<td>7</td>
<td>14</td>
</tr>
<tr>
<td>10-49</td>
<td>19</td>
<td>38</td>
</tr>
<tr>
<td>50-249</td>
<td>24</td>
<td>48</td>
</tr>
<tr>
<td>250+</td>
<td>14</td>
<td>24</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Management systems already implemented (multiple response question)</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISO 9001 quality management systems</td>
<td>6</td>
<td>10</td>
</tr>
<tr>
<td>ISO 1400 environmental management systems</td>
<td>9</td>
<td>15</td>
</tr>
<tr>
<td>ISO 22000 food safety management systems Six Sigma</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>EFQM European foundation for quality management</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>ISO 18000 health and safety systems</td>
<td>6</td>
<td>10</td>
</tr>
<tr>
<td>Other</td>
<td>12</td>
<td>20</td>
</tr>
</tbody>
</table>

Table 3

Areas of Primary Concern

<table>
<thead>
<tr>
<th>B1 Leadership</th>
<th>1(%)</th>
<th>2(%)</th>
<th>3(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. We provide direction for the organization in developing its mission, vision and value, by:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Formulating and developing the mission (what our goals are) and the vision (where we want to go) of the organization by involving relevant stakeholders and employees.</td>
<td>75</td>
<td>15</td>
<td>10</td>
</tr>
<tr>
<td>• Translating the mission and vision into strategic (long-and medium-term) and operational (real and short-term) objectives and actions.</td>
<td>78</td>
<td>10</td>
<td>12</td>
</tr>
<tr>
<td>• Creating conditions for effective communication of its mission and vision by ensuring a wider communication of their values, strategic and operational objectives in the organization and to other stakeholders.</td>
<td>76</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>• Periodically reviewing the mission, vision and values to reflect changes in the organization’s external environment.</td>
<td>64</td>
<td>19</td>
<td>17</td>
</tr>
<tr>
<td>2. We develop and implement a system for the management of our organization’s, performance and change, by:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Developing processes and organizational structures in accordance with strategy, planning, needs and expectations of stakeholders, using available technologies.</td>
<td>75</td>
<td>10</td>
<td>15</td>
</tr>
<tr>
<td>• Defining appropriate management forms (levels, functions, responsibilities and competencies) and ensuring a system exists for managing such processes.</td>
<td>76</td>
<td>7</td>
<td>17</td>
</tr>
<tr>
<td>• Giving direction on output and outcome targets balancing the needs and expectations of different stakeholders.</td>
<td>49</td>
<td>29</td>
<td>22</td>
</tr>
<tr>
<td>• Communicating initiatives and reasons for changes to employees and relevant stakeholders.</td>
<td>73</td>
<td>15</td>
<td>12</td>
</tr>
<tr>
<td>3. We motivate and support people in the organization and act as role model, by:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Leading by example, thus acting in accordance with established objectives and values.</td>
<td>80</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>• Demonstrating personal willingness of leaders/managers to accept change through constructive feedback.</td>
<td>83</td>
<td>10</td>
<td>7</td>
</tr>
</tbody>
</table>

(to be continued)
• Promoting a culture of innovation and improvement by encouraging and supporting employees to make suggestions and be proactive in their daily work. 81 7 12

• Respecting and addressing employees’ individual needs and personal circumstances. 93 2 5

4. We manage the relations with politicians and other stakeholders in order to ensure shared responsibility, by:

• Developing and maintaining partnerships and networks with important stakeholders (Non-Government Organizations (NGOs), interest groups, industry and other public authorities). 56 22 22

• Seeking public awareness, reputation and recognition of the organization and its services. 73 17 10

• Developing a concept of marketing (product and service targeted) and its communication in relation to stakeholders. 68 22 10

B2 Strategy and planning

1. We gather information relating to the present and future needs of stakeholders, by:

• Identifying all relevant stakeholders. 71 17 12

• Systematically gathering and analyzing information about stakeholders, their needs and expectations. 54 34 12

• Systematically analyzing internal strengths and weaknesses (e.g. using methodologies such as, Total Quality Management (TQM), Common Assessment Framework (CAF), European Foundation of Quality Management (EFQM) and strengths, weaknesses, opportunities and threats (SWOT) analysis). 39 27 34

2. We develop review and update strategy and planning, taking into account the needs of stakeholders and available resources, by:

• Developing and applying methods to monitor measure and/or evaluate the performance of the organization at all levels ensuring the monitoring of the strategy’s implementation. 70 15 15

• Systematically reviewing risks and opportunities (e.g., SWOT analysis) and identifying critical success factors by regularly assessing these factors in the organization’s environment (including political changes). 58 17 25

• Balancing tasks and resources, long and short term pressures and stakeholder requirements. 51 29 20

• Assessing the need to reorganize and improve strategies and methods of planning. 61 22 17

3. We implement strategy and planning in the whole organization, by:

• Translating strategic and operational objectives of the organization into relevant plans and tasks for departmental units and individuals within the organization. 53 32 15

4. We plan, implement and review modernization and innovation, by:

• Integrating tools and measures (e.g., input→ process→ output measurement or the use of TQM principles). 48 22 30

• Ensuring the availability of the necessary resources to implement the planned changes. 70 13 17

B3 People

1. We plan, manage and improve human resources transparently with regard to strategy and planning, by:

• Regularly analyzing current and future human resource needs, taking into account the needs and expectations of stakeholders. 73 12 15

• Ensuring HR capability (recruitment, allocation, and development) is available to achieve and balance tasks and responsibilities. 73 10 17

• Ensuring good environmental working conditions throughout the organization including taking care of health and safety requirements. 98 0 2

• Ensuring that conditions are conducive towards achieving a reasonable work-life balance for employees. 90 5 5

2. We identify, develop and use competencies of employees, aligning individual and organizational goals, by:

• Identifying current competencies at the individual and organizational level in terms of knowledge, skills and attitudes. 86 12 2

• Developing and agreeing on personal training and development plans for all employees with a special emphasis on managerial, leadership, and abilities to deal with diverse customers and partners. 75 15 10

• Planning of training activities and developing communication techniques in the areas of risk and conflict of interest management. 63 15 22

3. We involve employees in open dialogue and empowerment, by:

• Promoting a culture of open communication and dialogue and encouraging team work. 80 12 8

• Involving employees and their representatives in the development of plans, strategies, goals the design of processes and in the identification and implementation of improvement activities. 61 22 17

• Regularly conducting staff surveys including publishing results/summaries/interpretations. 35 27 38

(to be continued)
B4 Partnerships and resources

1. We develop and implement key partnership relations, by:
   • Identifying potential strategic partners (e.g., purchaser-provider, co-production) and establishing an appropriate partnership agreement taking into account the nature of the relationship. 69 22 9

2. We develop and implement partnerships with customers, by:
   • Ensuring transparency of the organization as well as its decisions and development. 51 15 34
   • Being open to ideas, suggestions and complaints by customers, and developing as well as using appropriate mechanisms to collect them (e.g., by means of surveys, consultation groups, questionnaires, complaints boxes, opinion polls, etc.). 76 12 12

3. We manage finances, by:
   • Ensuring the cost efficient management of financial resources. 90 5 5
   • Introducing innovative systems for budgetary and cost planning (e.g., multi-annual budgets, programmes of project budgets). 63 15 22
   • Ensuring investment decisions and financial controls are based on cost/benefit-analysis. 78 15 7

4. We manage information and knowledge, by:
   • Developing systems for managing, storing and assessing information and knowledge within the organization in accordance with strategic and operational objectives. 83 12 5
   • Developing internal channels to cascade such information throughout the organization to ensure that all employees have access to the information and knowledge relevant to their tasks and objectives. 63 27 10

5. We manage technology, by:
   • Implementing an integrated policy of technology management in accordance with the strategic and operational objectives of the organization. 76 12 12

6. We manage amenities, by:
   • Ensuring a safe, cost efficient and ergonomically suitable use of office facilities based on strategic and operational objectives; accessibility by public transport; needs of the employees; local culture and physical constraints (e.g., open plan offices vs. individual offices, mobile offices) and technical equipment (e.g., number of computers, photocopiers and internet access by service type). 81 7 12
   • Ensuring an efficient, cost effective and sustainable use of transport and energy resources. 66 15 19
   • Ensuring an efficient, cost effective, planned and sustainable maintenance of buildings, offices and equipment. 87 8 5

B5 Processes

1. We identify, design, manage and improve processes on an ongoing basis, by:
   • Identifying, describing and documenting key processes on an ongoing basis. 76 17 7
   • Identifying process owners and assigning responsibilities to them. 78 12 10
   • Allocating resources to processes based on the relative importance of their contribution to the strategic aims of the organization. 68 27 5
   • Improving processes on the basis of their measured efficiency, effectiveness and results (outputs), in conjunction with relevant stakeholders. 68 20 12
   • Analyzing and evaluating key processes, risks and critical success factors taking the objectives of the organization and its changing environment into consideration. 71 17 12
   • Identifying, designing and implementing process changes leading to one-stop-principle services. 48 40 12
   • Measuring and reviewing the effectiveness of process changes and carrying out benchmarking to drive improvement. 63 27 10

2. We develop and deliver customer-oriented services and products, by:
   • Involving customers and other stakeholders in the development of quality standards for services, products and information for customers. 61 17 22
   • Developing clear guidelines and regulations using plain language. 75 15 10
   • Developing sound response query handling and complaint management systems and procedures. 66 19 15

3. We innovate processes involving customers, by:
   • Providing the resources necessary for process innovations. 49 24 27

(to be continued)
Utilizing the information gathered from the qualitative and quantitative study, the major problem areas identified per industry sector are listed in Table 4. For instance as indicated in Table 3 above, leadership issues appear to be of less importance to the Banking and Automotive and Transport Industries. It was found in the focus groups that there are some issues in the leadership field that need to be addressed unlike the other three industries. Putting therefore the findings of both studies the research team has identified the problem areas needing to be addressed per industry.
Table 4

**Problem Areas Validation**

1. **Construction**
   - **B2 Strategy and planning**
     - Developing and applying methods to monitor and/or evaluate the performance of the organization at all levels ensuring the monitoring of the strategy’s implementation.
   - **B5 Processes**
     - Subcontractor management (no standards).
     - Risk management.
     - Developing sound response query handling and complaint management systems and procedures.
     - Using regular surveys, other forms of structured data gathering and data gathered during day-to-day customer contact in order to determine and enhance customer relationship satisfaction levels.
   - **B9 Key performance results**
     - Extent to which the goals are achieved in terms of output (delivery of products or services).
     - Cost efficiency (outputs achieved at the lowest possible cost).
     - Process performance.

2. **Hospitality**
   - **B2 Strategy and planning**
     - Systematically gathering and analyzing information about stakeholders, their needs and expectations.
   - **B5 Processes**
     - Risk management.
     - Demand capacity management.
     - Measurement of operational cost.
   - **B6 Customer-oriented results**
     - Customer satisfaction measurement.

3. **Automobile/transport**
   - **B1 Leadership**
     - Promoting a culture of innovation and improvement by encouraging and supporting employees to make suggestions and be proactive in their daily work.
   - **B2 Strategy and planning**
     - Systematically gathering and analyzing information about stakeholders, their needs and expectations.
     - Ensuring the availability of the necessary resources to implement the planned changes.
   - **B3 People**
     - Identifying current competencies at the individual and organizational level in terms of knowledge, skills and attitudes.
     - Promoting a culture of open communication and dialogue and encouraging teamwork.
     - Involving employees and their representatives in the development of plans, strategies, goals, the design of processes and in the identification and implementation of improvement activities.
   - **B4 Partnerships and resources**
     - Partnership management.
     - Supplier management.
     - Information technology management.
   - **B5 Processes**
     - Identifying, describing and documenting key processes on an ongoing basis.
     - Allocating resources to processes based on the relative importance of their contribution to the strategic aims of the organization.
     - Improving processes on the basis of their measured efficiency, effectiveness and results (outputs), in conjunction with relevant stakeholders.
   - **B6 Customer-oriented results**
     - Customer service management.

(to be continued)
### B7 People results
- Measure satisfaction level of employees (e.g., levels of absenteeism or sickness, rates of staff turnover, number of complaints).

### B9 Key performance results
- The degree of involvement of all stakeholders in the organization.
- Process performance.

### 4. Healthcare

#### B2 Strategy and planning
- Systematically analyzing internal strengths and weaknesses (e.g., using methodologies such as, Total Quality Management (TQM), Common Assessment Framework (CAF), European Foundation of Quality Management (EFQM) and Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis).
- Balancing tasks and resources, long and short term pressures and stakeholder requirements.

#### B4 Partnerships and resources
- Technology management.

#### B5 Processes
- Identifying, describing and documenting key processes on an ongoing basis.
- Measuring and reviewing the effectiveness of process changes and carrying out benchmarking to drive improvement.
- Using regular surveys, other forms of structured data gathering and data gathered during day-to-day customer contact in order to determine and enhance customer relationship satisfaction levels.
- Risk management.
- Risk assessment.
- Financial management.
- Inventory management.
- Waste management.
- Subscription.

#### B6 Customer-oriented results
- Customer measurement.

### 5. Banking/finance/insurance

#### B1 Leadership
- Creating conditions for effective communication of its mission and vision by ensuring a wider communication of their values, strategic and operational objectives in the organization and to other stakeholders.
- Communicating initiatives and reasons for changes to employees and relevant stakeholders.
- Promoting a culture of innovation and improvement by encouraging and supporting employees to make suggestions and be proactive in their daily work.

#### B2 Strategy and planning
- Systematically reviewing risks and opportunities (e.g. SWOT analysis) and identifying critical success factors by regularly assessing these factors in the organization’s environment (including political changes).
- Strategy execution monitoring.
- Strategic identification of critical projects for implementation.
- Project improvement implementation.

#### B3 People
- Regularly analyzing current and future human resource needs, taking into account the needs and expectations of stakeholders.
- Identifying current competencies at the individual and organizational level in terms of knowledge, skills and attitudes.
- Planning of training activities and developing communication techniques in the areas of risk and conflict of interest management.
- Involving employees and their representatives in the development of plans, strategies, goals the design of processes and in the identification and implementation of improvement activities.
- Human resources.
- Performance measurement.
- Identification of training needs.
- Training.

(to be continued)
**B4 Partnerships and resources**

- Ensuring a safe, cost efficient and ergonomically suitable use of office facilities based on strategic and operational objectives; accessibility by public transport; needs of the employees; local culture and physical constraints (e.g., open plan offices vs. individual offices, mobile offices) and technical equipment (e.g., number of computers, photocopiers and internet access by service type).

**B5 Processes**

- Developing clear guidelines and regulations using plain language.
- Providing the resources necessary for process innovations.
- Handling feedback received from day-to-day contacts, including complaints.
- Following up on sales, servicing and other contacts in order to determine levels of satisfaction with products, services and other customer sales and servicing processes.
- New product development management.

**B6 Customer-oriented results**

- The extend of employee training in relation to the effective handling of customer relationships (e.g., professionalism and friendly communication with, and treatment of customers).

**B7 People results**

- The level of employees’ involvement in the organization and its mission.
- Measure level of performance by employees (e.g., measures of productivity, results of evaluations).

**B8 Society results**

- General public’s awareness of the impact of how the organization’s performance affects the quality of our customers’ lives.

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**Discussion on Findings and Piloting**

Responding to the two research questions posed earlier, for example,

1. In what process areas can Six Sigma be implemented in a small economy?
2. Is there a difference in the processes identified depending on the industry?

The participants of the focus groups and respondents of the questionnaire have been hesitant to agree that Six Sigma can be used during economic crisis period and more importantly the benefits to be derived if used in a small economy, like Cyprus. There was however, an interest for some to take up the free of charge six month pilot period offered since it will not have a financial burden on them.

More specifically, regarding the two research questions the findings from both the qualitative and quantitative study do illustrate that problem areas identified by industry vary.

**Hospitality and Tourism**

As a holiday resort, Cyprus depends heavily on tourism and other related services. However in the last two to three years due to exogenous factors this industry has been affected adversely. These exogenous factors are: cheap near by destinations, the international economic crisis, the swine flu and finally due to its geographical location it is frequently found to be close to political unrests. Six sigma can help to sooth out some of these issues now that the problem areas have been identified. In most cases, the areas which are often highlighted are poor service delivery, high costs, customer dissatisfaction, staff training etc. From the present study only the following issues (see Table 4) were identified by the organisations: (1) strategy and planning, (2) processes and (3) customer-oriented results.

The company selected to pilot the Six Sigma was a conference and tour operator.

**Banking and Insurance**

Over the past couple of years, this sector is pressured to reduce costs, improve their operational cycle, reduce risks, and be competitive. This industry has been heavily affected from the local conditions due to international
interest roles, the downturn of the construction industry, the effects that tourism had on the island and the spending habits of people on luxury items such as cars, etc. The present research identified the following issues (Table 4) which need to be addressed by Six Sigma in the banking and insurance industry: (1) leadership, (2) strategy and planning, (3) people, (4) partnerships and resources, (5) processes, (6) customer-oriented results, (7) people results and (8) society results.

The company selected and having qualified as an SME was a bank.

Construction and Real Estate

Very little research has been conducted on setting definite quantitative goals for performance improvement while considering the defect rate involved in construction operations or external influences which affect their project performance or operational integrity. Whilst the construction industry in Cyprus has been booming, during the international economic crisis the same industry has been affected the most after the hospitality and tourism sector. Only three problem areas have been identified needing the attention of Six Sigma. These are (1) strategy and planning, (2) processes and (3) key performance results.

A construction company was selected.

Automotive and Transport

For years, Six Sigma was viewed simply as a process improvement tool (like TQM) to help companies improve their processes and operations, reduce product defects and a methodology applicable to the manufacturing industry. In small economies for this particular industry we can generalise by saying that it does not including the manufacturing of automobiles but only the retail and maintenance component. The automotive industry has been affected very much because of the global crisis and local SMEs were not immune to those effects. Even so, the number of respondents were surprisingly better than anticipated and the following problem areas (Table 4) were identified: (1) leadership, (2) strategy and planning, (3) people, (4) partnerships and resources, (5) processes, (6) customer-oriented results, (7) people results and (8) key performance results.

A transport company was selected.

Healthcare

Despite the fact that generally Six Sigma principles and the healthcare sector are very well matched because of the healthcare nature of zero tolerance for mistakes and potential for reducing medical errors, the present research has shown that these organizations would like to use Six Sigma to address the following areas of concern (Table 3): (1) strategy and planning, (2) partnerships and resources, (3) processes.

Conclusion

Despite the limitations of the study (i.e., that only 50 companies participated in the study), the fact that results were rechecked with the aid of qualitative research it is argued that this exploratory study will provide room for further research in the field in small economies. In implementing Six Sigma in SMEs, its penetration into the workforce and the task of gaining commitment by management and employees would depend on whether the organization had prior experience with quality management systems, namely ISO 9000, Balanced Scorecard, Total Quality Management (TQM), European Foundation for Quality Management (EFQM) or other quality initiatives. In addition, it must be emphasized that the commitment of the top management is essential to progress and goal to attain Six Sigma projects.
As illustrated above Six Sigma is no longer a theoretical or big country panacea. It can be the solution in improving quality, minimizing defects and costs of SMES in small or emerging economies.

In conclusion it can be said that whilst Six Sigma can be implemented by SMEs in a small economy there will be lack of commitment to do so during harsh economic crisis since immediate benefits cannot be achieved. Six Sigma is a long term investment that needs to be made. Regarding the second research question whilst it was found that each industry has its own problem areas, strategy and planning is a problem area identified for all five sectors. In fact, in small economies, where most businesses are not only SMEs but family businesses, it is hard to have the vision and appropriate people to form strategic plans. Further research is suggested in this field.

References


After the 2001 economic crisis, the banking sector restructuring program (BSRP) has been designed for the establishment of a stronger financial framework and the improvement of competition in the Turkish banking sector. The program constitutes the policies for solving specific problems such as the mismanaged assets of some banks and the recovery of regulating and supervising of the sector. This study aims to analyze the efficiency and productivity changes in the Turkish banking sector during 2002-2009. During this period the Banking Sector Restructuring Program has been applied. The data envelopment analysis (DEA) is conducted for the efficiency measurement under the production and intermediation approaches and it is observed that the efficiency of banks increased for both approaches. The mean efficiency values for the intermediation approach are higher than the values for the production approach, indicating a better functioning in financial intermediation as compared to their operational performance. The Malmquist index based on the intermediation approach is calculated to determine the productivity of the banking sector. It is observed that the productivity of banks increased during the period and the increase resulted mainly from investments in technology.

Keywords: Turkish banking sector, efficiency and productivity, banking sector restructuring program, data envelopment analysis, Malmquist index

Introduction

The main function of a financial system is to channel funds from surplus units to deficit units with an efficient and continuous manner, and the banking system in an economy plays the major role in financial intermediation. In the last 25 years, there have been severe banking crises especially in emerging countries, resulting in huge financial costs.

These crises generally affected the great majority of banks in the banking system and governments applied urgent and strict regulations which are generally named as “Banking Sector Restructuring Programs–BSRP”. While restructuring programs of different countries include precautions and applications in line with their own country characteristics, basic principles of the programs do not change and focus on the rapid improvement of the financial, operational, and structural conditions of the banking sector. Banking crises result in considerable decreases in most banks’ equity. From the financial perspective, the restructuring process constitutes rapid precautions for banks to strengthen their equity and other precautions for prevention against deepening of the
crisis and its spill-over effect to other sectors. Providing support to banks which are in need of liquidity and guaranteeing deposit accounts at banks have been initial and primary actions during crises periods.

The aim of this study is to analyze the efficiency of the Turkish banking sector by the data envelopment analysis for the period of 2002-2009, when the Turkish Banking Sector Restructuring Program has been continuously practiced. The Malmquist index based on the data envelopment analysis has been calculated for determining the change in the total factor productivity. The Malmquist index calculation has been based on the intermediation approach. Section 2 briefly explains the Restructuring Program; Section 3 summarizes some of the related empirical studies; Section 4 gives the methodology; Section 5 gives the empirical findings, and finally Section 6 concludes.

The Turkish Banking Sector Restructuring Program

According to the 18th Stand–by signed with the IMF in 2001, improvement of the financial system and rapid continuity of the structural reforms have been basic priorities by the Turkish Government. The main purpose of the program is to eliminate the instability which resulted from the 2001 crisis and construct a framework which enables a sustainable economic growth by lowering inflation in the long run. The program specifically aims to restructure the Turkish banking sector in order to establish a stronger linkage with the real sector. The “Banking Sector Restructuring Program–BSRP” announced on May 15, 2001, focuses on the intermediation role of banks and aims to develop a transition process in which the banking sector will be more resistant to inner and outer shocks and compete at the international level. The recovery of corruption in the banking sector and the elimination of financially weak banks from the system were declared as the prior actions of the Program for a stronger Turkish banking sector (The BRSA Report, 2002).

Figure 1. The Turkish banking sector restructuring process. Source: The BRSA Report, 2002, 11.
The Restructuring Program focuses on two points: First, financial and operational restructuring in the banking sector have to be made; Second, legal and institutional framework must be prepared to strengthen the regulation and supervision of banks and to increase the efficiency and competitive power of the sector. Parallel to these main issues, the Program constitutes the following actions to be put into practice:\(^1\):

1. Restructuring of public banks financially and operationally;
2. Solving the problems of banks which have been under the control of The Savings Deposit Insurance Fund (SDIF) urgently;
3. Strengthening of private banks which have been negatively affected by the crisis;
4. Legal and institutional procedures to increase the efficiency of supervising and controlling in the banking sector and to enable the sector to become more efficient and competitive.

The BRSA Report (2004) stated that the deep financial crisis in 2001 and the global economic/political developments slowed down the recovery of the Turkish banking sector. It is understood that the stagnation in the domestic financial system and the economy would be longer than expected. According to the data in September 2001, especially small and medium sized banks in the sector shrank and realized losses in their equity. The negative expectations in the sector caused private banks to diminish their credit volumes to the real sector. The credits to be repaid to banks considerably increased by the middle of 2001 as a result of the slowdown in the economy. Parallel to these issues, the BRSA constituted new decisions to limit the negative effects of the economic environment to the banking sector, to eliminate the uncertainty on foreign investors and corporations, and to prevent the real sector. The actions taken by the BRSA to strengthen the Restructuring Program may be summarized as follows:

1. Establishment of asset management firms. The establishment of asset management firms was encouraged by tax advantages to solve the collection problems of credits provided by banks and to make their assets more liquid. The SDIF is a partner in these companies with a 20% share.
2. Credit restructuring by the Istanbul approach. The Istanbul Approach was designed and applied to companies which were unable to repay their debt to banks and other financial institutions due to the 2001 crisis. This approach aims to restructure the debt of the companies while continuing their operations and to supply additional source if it is needed. The approach was put into practice during 2002-2005 and a credit amount of approximately six million $ belonging to 322 firms was restructured. The Istanbul Approach was mentioned in The BRSA Report (2002) and results of the actions were given in detail in The BRSA Report (2004).
3. Strengthening the capital of banks. Banks increased their capital to strengthen their equity during the Restructuring Program. The suitability of principles of external auditing for all bank groups had been determined in parallel with the Basel II Accord.

**Literature Review**

Many researchers have studied the efficiency of the Turkish banking sector by the DEA. The results of most studies show that the financial liberalization after 1980 has generally a positive effect to the efficiency of the Turkish banking sector, especially in terms of financial intermediation rather than operational efficiency\(^2\).

\(^1\) Please see detail explanations at www.bddk.gov.tr
\(^2\) For a detailed literature survey, please see Ozdemir (2006).
(2001), Sathye (2002), Casu, Girardone and Molyneux (2004), Sturm and Williams (2004), Oncu and Aktas (2007) are some of the studies which measure the total factor productivity of the banking sector with the Malmquist Index. The Malmquist Index is calculated in many studies of the developed countries to analyze the effects of financial liberalization and financial crises to the productivity of their banking sector.

Jackson, Fethi and Inal (1998) analyzed the efficiency and productivity of the Turkish commercial banks to determine the change during 1992-1996 for each bank in the sector. Results showed that, except for 1993-1994, foreign banks and private banks had a higher efficiency and productivity than public banks due to improvements in technology and competition power. The study indicated that the financial crisis in 1994 had a severe negative impact on the banking sector and preventive measures taken after the crisis increased the efficiency and productivity of banks.

Isik and Hassan (2003) analyzed the effects of the financial crisis in 1994 to the performance of the banking sector with the Malmquist productivity change index. Results showed that banks were affected negatively in terms of efficiency and productivity due to the crisis. The study also indicated that banks, in two years after the crisis, reached to the levels of efficiency and productivity at the before-crisis period, with the precautions taken by the government authorities and banks.

Kaya and Dogan (2005) studied the banking sector with the Malmquist productivity index for 2002-2004, the period after the financial crisis in 2001 which has more severely affected the Turkish financial system than the crisis in 1994. The authors indicated that the productivity increase in the banking sector was caused by the technological improvements.

Basti (2006) also studied the effects of the financial crisis in 2001 to the total productivity of the sector. Results proved that total factor productivity decrease was caused by the crisis, and after the crisis productivity increased with the precautions taken in the sector.

**Methodology**

**Malmquist Productivity Index**

The Malmquist Index measures the total factor productivity (TFP) change between two data points by calculating the ratio of the distances between each data point relative to a common technology. Malmquist index numbers can be defined using either the output-oriented approach or the input-oriented approach. This study prefers to utilize the output-oriented Malmquist productivity index. The output-orientated productivity measures focus on the maximum level of outputs that could be produced using a given input vector and a given production technology relative to the observed level of outputs. This is achieved using the output distance functions and Caves, Christensen and Diewert (1982) showed how distance function can be used to define Malmquist indices of productivity change. Caves et al. (1982) proposed that output-based Malmquist productivity index between time periods ($t$) and ($t+1$) can be defined as:

$$M_{t,t+1}(y^{t+1},x^{t+1},y^{t},x^{t}) = \left[ \frac{D'(y^{t+1},x^{t+1})}{D'(y^{t},x^{t})} \right]^{1/2}$$

where the notation $D$ represents the distance function and a value of $M$ is the Malmquist productivity index. The first ratio represents the period $t$ Malmquist index. It measures productivity change from period $t$ to period $t+1$ using period $t$ technology as a benchmark. The second ratio is the period $t+1$ Malmquist index and measures productivity change from period $t$ to period $t+1$ using period $t+1$ technology as a benchmark. A value of $M$
greater than one $M>1$ denotes productivity growth, while a value less than one $M<1$ indicates productivity decline, and $M=1$ corresponds to stagnation. Färe, Grosskopf and Lovell (1985) showed that the Malmquist productivity index can be decomposed into two components, which is an equivalent way of index 1, as follows:

$$M_{t,t+1}(y^t, y^{t+1}, x^t, x^{t+1}) = \frac{D'^{(t+1)}(y^{t+1}, x^{t+1})}{D'(y^t, x^t)} \left[ \frac{D'(y^{t+1}, x^{t+1})}{D'^{(t+1)}(y^{t+1}, x^{t+1})} \right]^{1/2}$$

In Equation (2), the term outside the brackets $CU_{t,t+1}$ is a ratio of two distance functions, which measures the change in the output-oriented measure of the Farell technical efficiency between period $t$ and $t+1$ as a “catching-up to the frontier” effect. The square root term $TC_{t,t+1}$ in Equation (2) is a measure of the technical change in the production technology. It is the geometric mean of the shift in technology between the two periods, evaluated at $x'$ and also at $x^{t+1}$. The term $CU_{t,t+1}$ is greater than, equal to, or less than 1 if the producer is moving closer to, unchanged, or diverging from the production frontier. The square root term $TC_{t,t+1}$ is greater than, equal to, or less than 1 when the technological best practice is improving, unchanged, or deteriorating, respectively.

The Malmquist productivity index can be interpreted as a measure of the total factor productivity (TFP) growth. Improvements in the productivity, as well as improvements in the efficiency and technology, are indicated by values greater than 1, whereas values less than 1 indicate regress. The Malmquist productivity index $M$ and its two components are local indices (Malmquist, 1953). This feature allows considerable flexibility in explaining the considered model of productivity change, both among researchers and over time.

Calculation and decomposition of the adjacent period version of the Malmquist index in Equation (2) includes four different distance functions, $D'(y^t, x^t)$, $D'(y^{t+1}, x^{t+1})$, $D'^{(t+1)}(y^{t+1}, x^{t+1})$ and $D'^{(t+1)}(y^{t+1}, x^{t+1})$, which are the reciprocal of the Farrel technical efficiency indicators.

**Data and Analysis**

The study conducts the data envelopment analysis (DEA) to test the efficiency of the Turkish banking sector for 2002-2009, the eight year period after the financial crisis in 2001. The DEA has been used under the assumption of constant returns to scale assumption, and the banking sector has been analyzed for both the production approach and the intermediation approach. The input and output variables for the above-mentioned approaches are in line with those used in most of the related literature. For the intermediation approach, the input and output variables have been chosen with considering the functions of the commercial banks in the system. The variables have been mostly determined parallel to those used in the comprehensive study of Ozdemir (2006), to cover almost the whole financial intermediation process of the banking sector. The yearly data have been gathered from the aggregated balance sheets and income statements of commercial banks at www.tbb.org.tr and www.bddk.gov.tr. The second part of the study analyzes the total productivity change in the sector by calculating the Malmquist index, and the analysis is based on the intermediation approach. The Data Envelopment Analysis computer program DEAP 2.1 has been used for calculating the Malmquist total factor productivity (TFP) indices.

There is no specific consensus for input and output variables to be used in the DEA analyses in the banking literature (Grifell-Tatje & Lovell, 1996). Yet, two main approaches, namely production approach and intermediation approach, have been considered in the banking studies utilizing the DEA. In the production approach, it is accepted that banks produce deposits and credits by using their capital and human sources. This
approach generally uses operational expenses (costs) as an input variable, and number of deposit and credit accounts are treated as output variables to determine the efficiency of banks. In the intermediation approach, it is accepted that banks channel deposits into credits and other assets, i.e. marketable securities portfolios. The input and output variables are expressed in money terms instead of account numbers, and interest expenses are considered besides operational expenses (Cingi & Tarim, 2000).

The intermediation approach is preferred to production approach in most Malmquist TFP index analyses (Aly, Grabowski, Pasurka, & Rangan, 1990). Moreover, the financial crisis in 2001 emerged as a banking crisis and resulted a severe corruption in the sector, with many financially weak banks being transferred to The Savings Deposit Insurance Fund (SDIF). Thus, this study analyzes both approaches for fully testing the efficiency of the sector with the DEA, and the Malmquist TFP index calculation is especially based on the intermediation approach to determine the productivity change in the financial intermediation of the Turkish banking sector.

The determination of variable return or constant return to scale assumption has importance in calculating total factor productivity changes. In calculating the distance functions required for the Malmquist index, the study of Coelli, Rao and Battese (1997) indicated that productivity changes are incorrectly calculated under the variable return to scale assumption (VRS). The result is in parallel to the results of Grifell-Tatje and Lovell (1996). Thus, calculation of the Malmquist index under the constant return to scale (CRS) assumption is preferred in the TFP changes analysis. The input and output variables used in the DEA and Malmquist index calculation are given below in Table 1.

The description of some of the variables are as follows:

**External sources excluding deposits:** Loans borrowed from money markets; loans taken from Turkish banks, correspondent banks and international banks; funds obtained by issuing financial securities; mutual funds; and other external sources.

**Physical capital:** The book value of net fixed assets (i.e., building, computers, ATM’s, POS machines, etc.).

**Marketable securities portfolio:** The total of (1) securities for trading, (2) securities to sell, and (3) securities to hold until their maturities.

### Empirical Results

The DEA conducted for the production and intermediation approaches under the assumption of output-oriented constant return to scale (CRC) puts forward the efficiency level of banks for 2002-2009 and makes it possible to make comparisons between the two approaches. The results of the DEA analysis are given in Table 2.
The results indicate that the efficiency scores show an increasing trend both for the total banks and inefficient banks during the restructuring process for the two approaches. In 2009, total mean reaches to almost 1 which indicates a perfect efficiency for the banks analyzed under the intermediation approach. The difference between the mean of inefficient banks and total banks seems to decrease towards the end of 2002-2009; as the efficiency scores are 0.983 for total banks and 0.891 for the inefficient banks, while the scores converge and become 0.991 as the total mean and 0.930 as the mean of inefficient banks. This fact is also observed with a much rapid increase in the mean of inefficient banks reaching to 0.930 in 2009 from 0.891 in 2002. The general results for the two approaches show that the mean values are greater under the intermediation approach both for the total banks and inefficient banks. For the period of 2002-2009, the total mean is 0.98 and the mean of inefficient banks is 0.90 for the intermediation approach; and the total mean is 0.83 and the mean of inefficient banks is 0.72 for the production approach.

In the second part of the analysis, the Malmquist index has been calculated to observe the TFP changes in the Turkish banking sector during 2002-2009 and the results are given in Table 3.

Table 2
Efficiency Results of Data Envelopment Analysis

<table>
<thead>
<tr>
<th></th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intermediation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>approach: Total mean</td>
<td>0.983</td>
<td>0.989</td>
<td>0.968</td>
<td>0.977</td>
<td>0.980</td>
<td>0.985</td>
<td>0.989</td>
<td>0.991</td>
</tr>
<tr>
<td>Mean of inefficient</td>
<td>0.891</td>
<td>0.899</td>
<td>0.905</td>
<td>0.911</td>
<td>0.913</td>
<td>0.900</td>
<td>0.925</td>
<td>0.930</td>
</tr>
<tr>
<td>Production</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>approach: Total mean</td>
<td>0.840</td>
<td>0.846</td>
<td>0.799</td>
<td>0.808</td>
<td>0.811</td>
<td>0.821</td>
<td>0.869</td>
<td>0.873</td>
</tr>
<tr>
<td>Mean of inefficient</td>
<td>0.702</td>
<td>0.745</td>
<td>0.711</td>
<td>0.724</td>
<td>0.729</td>
<td>0.713</td>
<td>0.726</td>
<td>0.728</td>
</tr>
</tbody>
</table>

Table 3
The Malmquist Index of Productivity Changes

<table>
<thead>
<tr>
<th>Years</th>
<th>Efficiency change</th>
<th>Technological change</th>
<th>Scale efficiency change</th>
<th>Pure efficiency change</th>
<th>Total factor productivity (TFP) change</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002-2003</td>
<td>0.913</td>
<td>1.091</td>
<td>0.933</td>
<td>0.948</td>
<td>0.996</td>
</tr>
<tr>
<td>2003-2004</td>
<td>0.901</td>
<td>1.102</td>
<td>0.947</td>
<td>0.951</td>
<td>1.008</td>
</tr>
<tr>
<td>2004-2005</td>
<td>0.967</td>
<td>1.065</td>
<td>1.010</td>
<td>0.957</td>
<td>1.029</td>
</tr>
<tr>
<td>2005-2006</td>
<td>0.941</td>
<td>1.102</td>
<td>0.964</td>
<td>0.976</td>
<td>1.037</td>
</tr>
<tr>
<td>2006-2007</td>
<td>0.965</td>
<td>1.176</td>
<td>0.953</td>
<td>1.013</td>
<td>1.135</td>
</tr>
<tr>
<td>2007-2008</td>
<td>0.966</td>
<td>1.225</td>
<td>0.974</td>
<td>0.971</td>
<td>1.158</td>
</tr>
<tr>
<td>2008-2009</td>
<td>0.979</td>
<td>1.266</td>
<td>0.974</td>
<td>0.950</td>
<td>1.170</td>
</tr>
</tbody>
</table>

Table 3 shows that TFP change has a steady increasing pattern after 2003, with the TFP change index values greater than 1. The productivity index has the lowest value of 0.996 in 2002, the first year after the financial crisis in 2001. The efficiency change and the technological change values, as being the two components of TFP change, indicate that the increase in the TFP changes stems mainly from the technological changes. The efficiency change values are below 1, but have an increasing trend after 2005.

Conclusion

It is observed with the data envelopment analysis that the mean efficiency values of the Turkish banking sector show a higher and increasing trend for the intermediation approach as compared to the production
approach during 2002-2009. It is believed that the application of the Banking Sector Restructuring Program, careful bank top managements to risks of any potential crisis, optimistic expectations due to improvements in the macroeconomic framework starting in 2003, and the rapid declining of inflation and interest rates resulted a financially stronger and a better functioning banking system in terms of their financial intermediation.

The production approach, which is commonly used for measuring the cost (operational) efficiency of the banking sector, shows that the mean efficiency values increased during 2002-2009. This result may be explained with the effort of banks to diminish the operational expenses and to constitute the ratio of (personnel/branch) more effectively. It is observed that the efficiencies of inefficient banks improve during the period and rise towards the efficiencies of the sector. The decreasing trend in the difference between the total mean efficiencies and the mean of inefficient banks explains the convergence of banks in the sector in terms of their operational performance.

The Malmquist index values prove that the productivity of the banking sector increased after 2002, and the increase mainly stemmed from technological investments. Banks operated with deliberation in 2002 by minimizing their expenses (including expenses for technology) and completed the year with a limited decrease in their productivity. In later years, increases in the efficiency changes and technology changes had impact on the productivity growth; while it is evident that technological improvements had the dominant effect. The efficiency change with all values lower than 1 shows an increasing trend and could not reach to the levels of the technology increase.

After the financial crisis in 2001 and application of the Banking Sector Restructuring Program, corporate growth as mergers and acquisitions in the sector, a more competitive financial environment, better risk management, advanced financial system communication, technology investments, new financial instruments and product differentiation, specialization, and human capital have constituted the primary issues for the Turkish banking sector. It is believed that these issues contributed to the growth of banks which were able to operate with increasing levels of efficiency and productivity during 2002-2009. The results of this study reinforces that the Program has been successful in parallel to its purposes, and it may be expected that the increasing trend in their operational performance and financial intermediation will be seen in coming years.

References


Comparison of Efficiencies of Enterprises Engaged in Food Sector in Turkey by Data Envelopment Analysis Taking Account of Their Efficiencies and Rantability Rates

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Marmara University, Turkey

Enterprises are in competition with other enterprises operating in their fields. In today’s world, enterprises need to increase their efficiency and productivity, the values of which, if below market conditions, they need to raise. Data Envelopment Analysis, widely utilized in efficiency and productivity measurements is a method that measures the efficiency of one unit relatively, taking more than one input and output simultaneously. DEA interactively determines the efficiency of units with similar inputs and outputs. Thus, not only the efficient units are determined, but an opinion is offered as to how the inefficient units can be improved. In this study, 12 enterprises that were among the first 500 enterprises in Turkey in 2008, active in Istanbul Stock Exchange and operating in food sector through Data Envelopment Analysis. In the model, activity rates were used as input values, rantability rates were used as output values. In conclusion of simultaneous analysis of input and output values, efficient and inefficient enterprises were determined.

Keywords: data envelopment analysis, decision making units, CCR, BCC, consumption cooperatives, retailing

Introduction

Enterprises need to utilize their sources in the most efficient way as possible in order to accommodate themselves to constantly changing conditions of competition and to survive in the market for a longer period. The efficiency of an enterprise can be determined by performing necessary analyses in order to reduce the factors affecting its profitability on an input basis and to increase them on an output basis. In today’s environment, it is accepted that the enterprise managers can prove their standing in the market by increasing their efficiency with these analyses. Data Envelopment Analysis (DEA), is a “data-oriented” approach that is used to measure the efficiencies or, in other words, performances of units with similar multiple input and output values and which was defined first by Farrel (1957) and, following him, by Charnes, Cooper and Rhodes (1978). DEA determines the units that are efficient, by comparing the units that are assumed to be similar among each other, and evaluates other units according to this efficient unit(s). Because DEA is a non-parametric method, no assumption is needed regarding the form of function (Yılmaz, Özdiğ, & Akdoğan, 2002). Units that perform similar operations in their
fields of application such as companies that are active as enterprises, non-profit schools, hospitals and military units are named Decision Making Units (DMU). DMUs are units that use similar inputs and produce similar outputs.

With DEA that is performed with single input and output values of decision making units, Input/Output rates for each DMU are found, and, of these rates, the decision making units with the value of 1 are considered “efficient” (Cooper, Seiford, & Zhu, 2004). The lines on which the decision making unit with the value of 1 and which is considered efficient is placed are named “efficient frontiers”. More than one decision making unit can be included above this limit. And because other units shall be below this limit, all decision making units are encompassed with efficiency limit. Units above the efficiency limit (above the line) are defined as the most efficient decision making units. In cases where the DMU has more than one input and output value, units above the efficiency limit are considered efficient units, while the area where inefficient units are present and which is above the efficiency limit is named “production possibility”. And the efficiency of a decision making unit that is not efficient is found by dividing the distance between the zero point and the efficiency limit by the distance from the efficiency limit to itself. Also, non-efficiency of this DMU is evaluated by the combination of efficient DMUs which are closest to it. Therefore, units at the efficiency limit are named “reference set” for this DMU. Reference set is the unit set of the inefficient decision making unit which applies the methods applied by the efficient unit or units and reveals which efficient units they are closer in order to reach the same level of efficiency. Reference set may vary for each inefficient unit.

DEA generally includes a four-stage process; selection of decision making units, determination of inputs and outputs, selection of the model and interpretation of results; During the selection of decision making units, it must be observed that the units are evaluated by the same input-output combination. In other words, units must be similar in terms of their inputs and outputs. DEA determines the interactive efficiency of decision making units with each other in the model. Therefore, the efficiency of decision making unit that is not taken into the model can be more than those of unit within the model (Atan, Özgür, & Güler, 2003). Another issue is the number of DMUs. Though there are different opinions, it is a generally accepted criteria that number of decision making units to be selected must be \( Input \ number + output \ number + 1 \) or at least twice the number of variables (Bussofiane, Dyson, & Rhodes, 1991). The things which must be taken into account in the determination of input and output values are that these values must be measurable and must include all physical-economical sources. The determination of decision making units and input-output values is followed by the selection of model. Many DEA model can be established depending on their fields of use. If the control over input is little or none, an output-oriented model can be selected, if the control over the output is little or none, an input-oriented model can be selected. If the decision maker is only concerned with efficiencies, then all models can be used (Yaraloğlu, 2004). A large number of packaged software are available for DEA analyses. The most widely used ones are such as DEA-Solver, DEAP, EMS, Warwick DEAP. Most of these packaged software are Excel-supported.

The positive aspects of DEA are that it can process large number of input and output values (Cullinane, Song, Ji, & Wang, 2004), present reference sets and thereby lead the decision maker, ensure that the amount of efficiency and the sources are identified with each input and output value for each decision making unit and that it does not need several assumptions in order to identically measure input and output values if they have different units. Because the efficiency value of each decision making unit is determined in reference to other decision making units, these efficiency values are relative (Bal & Örkcü, 2005). However, it has some challenges, because it is sensitive to
measurement error (Malhotra, Malhotra, & Russel, 2010), and it is difficult to apply statistical hypothesis tests to the results for it is a non-parametric method (Köse, 2010), and because it performs section analysis.

**Basic DEA Models**

While DEA is used under assumptions of constant return to scale or variable return to scale, it is handled as either input or output. CRS is the constant return to scale assumption of DMUs and can be described as CCR model. VRS is the variable return to scale assumption and developed as the BBC model (Altın, 2010). In input-oriented solutions, output amounts are kept constant and variations (decreases) on input amounts are observed. In output-oriented solutions, input amounts are kept constant and variations (increases) on output amounts are observed (Behdioğlu & Özcan, 2009). BCC and ADD methods along with CRR method which is mostly used in DEA are briefly explained below.

**The CCR Model**

The CCR model, named after Charnes, Cooper and Rhodes and introduced by them in 1978 is one of the most fundamental DEA methods. They obtained an artificial input and output for each decision making unit by handling the efficiency value obtained by estimating an output to an input, by the estimation of more than one output to more than one input and found the efficiency value for decision making units. In this model, Weighted Input = \( v_1 x_{10} + \ldots + v_m x_{m0} \) and Weighted Output = \( u_1 y_{10} + \ldots + u_s y_{s0} \) for each decision making unit. Because there are \( m \) number of inputs and \( s \) number of outputs, given that \( j = 1, \ldots, n \), input and output data for each decision making unit \((DMU_j)\) are represented respectively as \((x_{1j}, x_{2j}, \ldots, x_{mj})\) and \((y_{1j}, y_{2j}, \ldots, y_{sj})\).

Basic efficiency criteria is found by dividing the weighted total of outputs by the weighted total of inputs (Klimber, Ratick, Tava, Vuyyuru, & Mrazik, 2010) and is represented as:

\[
\frac{u_1 y_{10} + \ldots + u_s y_{s0}}{v_1 x_{10} + \ldots + v_m x_{m0}}
\]  

Here, there are numbers of outputs and \( m \) number of inputs \( u_s \) represents the weight of the \( s \) output, \( y_s \) the amount of the same output, \( v_m \) the weight of \( m \) input and \( x_m \) the amount of \( m \) input. If an analysis is to be made in the CRR method, the efficiency criteria for linear solutions is represented as (Zhu & Cook, 2007):

\[
\max_{\mu, \nu} \theta = \mu_0 y_{10} + \ldots + \mu_s y_{s0} \\
\nu_1 x_{10} + \ldots + \nu_m x_{m0} = 1 \\
\mu_0 y_{1j} + \ldots + \mu_s y_{sj} \leq \nu_1 x_{1j} + \ldots + \nu_m x_{mj} \quad j = 1, \ldots, n \\
\nu_1, \nu_2, \ldots, \nu_m \geq 0 \\
\mu_0, \mu_1, \ldots, \mu_s \geq 0
\]  

A decision making unit in the CRR model for \((v^*, u^*)\) optimal weights and \( \theta^* \) optimal solution is considered efficient if \( \theta^* = 1 \) and there is at least one optimal \((v^*, u^*)\) given that \( v^* > 0, u^* > 0 \). In other cases, the decision making unit is not efficient. In other words, if \( \theta^* < 1 \) or \( \theta^* = 1 \) but at least one element of \((v^*, u^*)\) equals to zero, it is implied that the decision making unit is inefficient.

**The BCC Model**

The BCC model was developed in 1984 by Banker-Charnes-Cooper by making some variations on the assumptions of the CCR model. In the CCR model described above, the efficiency limit was drawn starting from
the origin. In the BCC model, however, the efficiency limit does not start from the origin. In this case, the efficient unit numbers may vary in both models for the same decision making units. In CCR model, proportional efficiency is in question and it ignores the input excess and output deficits. Differently from the CCR method, Banker, Charnes and Cooper have defined the production possibility set for the BCC model as $P_B = \{(x,y)/x \geq X\lambda, y \leq Y\lambda, e\lambda = 1, \lambda \geq 0\}$. Here, $X = (x_j) \in R^{mxn}$ and $Y = (y_j) \in R^{nxn}$ and $\lambda \in R^n$. And $e$ is the row vector with all its elements equal to 1. The input-oriented BCC model evaluates the efficiency of DMU by solving the following linear program (Cooper, Seiford, & Tone, 2006).

$$\min_{\theta_B, \lambda} \theta_B$$

$$\theta_B x_0 - X\lambda \geq 0$$

$$Y\lambda \geq y_0$$

$$e\lambda = 1$$

$$\lambda \geq 0$$

(3)

And the efficiency of decision making units in the BCC model is determined by $\theta_B$ and slacks. According to this, if $\theta_B = 1$ and $(s^-, s^+ = 0)$ there is no slack; the decision making unit is efficient. Here, $s^-, s^+$ represent the maximum input excess and output deficits. Also the decision making unit having the minimum input value for any input or maximum output value for any output is efficient. Because BCC efficiency limit is always below CCR efficiency limit, CCR efficiency scores are found below equal to BCC efficiency scores (Yaralıoğlu, 2004).

**Additive Model**

Additive model which is also named Social model is a method in which input-oriented and output-oriented models separately formulated in previous models are indicated in a single model. Therefore, if both input-orientedness and output-orientedness are to be handled together in a single model, the model to be established shall be the social method. In this method there are no efficiency scores for decision making units. Whether decision making units are efficient or not is determined by the values of slack variables. If all slack variables are equal to zero, that decision making unit is concluded to be efficient. The efficiency criterion for additive method is represented as (Cook & Zhu, 2005):

$$\max_{\lambda, s^- , s^+} z = e s^- + e s^+$$

$$X\lambda + s^- = x_0$$

$$Y\lambda - s^- = y_0$$

$$e\lambda = 1$$

$$\lambda \geq 0, s^- \geq 0, s^+ \geq 0$$

(4)

The efficiency of the decision making unit in ADD model depends only on whether $(s^- = 0, s^+ = 0)$. Therefore, a decision making unit that is inefficient in the BCC model can be said to be efficient in the ADD model (Cooper et al., 2006). Efficient frontier and production possibility set in the ADD model is the same in the BCC model.

Different DEA methods can be used according to different criteria. Which method used in the application depends on whether inputs and outputs are manageable or not. If the inputs are not manageable, the output-oriented model can be established, and if the outputs are not manageable, then the input-oriented model
can be established. If no orientation is in question, it is suitable to refer to the social method (Cooper et al., 2006).

Application and Results

Twelve enterprises engaged in the food sector in Turkey are selected for the application in order to demonstrate the statistical results of DEA models. These enterprises are, Anadolu Efes Beer and Malt Industry joint-stock company, Banvit Bandırma Vitamin Bait Industrial and commercial joint-stock company, Coca-Cola Drink joint-stock company, Dardanel Food Industry joint-stock company, Kent Food joint-stock company, Kerevitaş Food Industry joint-stock company, Pınar Integrated Meat and Flour Industry joint-stock company, Pınar Dairy Products Industry joint-stock company, Şeker Chicken and Bait Industry joint-stock company, Tat Canned Industry joint-stock company, Tukaş Food Industry joint-stock company and Ülker Biscuit Industry joint-stock company. The reason why these enterprises are selected is because they are active in İstanbul Stock Exchange and have a significant standing in Turkish Retail Sector. Ratio analysis was performed on the financial date on the financial statements of selected companies for the year 2008. Ratio, most basically, is the ratio of a value to another value of the same kind (Dumanoğlu & Gedikoğlu, 2004). In this method, the aim is to obtain a result regarding the financial structure and activity results of the enterprise by establishing mathematical relations between financial statement item or items (Argun & İbiş, 2004). The aim of the application performed by analyzing the said ratios is to determine the efficiency rates of these enterprises and to suggest the improvements that they can perform on the input and output values in order to assure the efficiency of inefficient enterprises. DEAP (Data Envelopment Analysis Program) and EMS (Efficiency Measurement System) packaged software was used in the analysis.

Inputs and Outputs

2008 data of 12 enterprises engaged in Food Sector in Turkey and active in Istanbul Stock Exchange are taken in the comparison of their efficiency using DEA models, activity rates as input values and rantability rates as output values. These rates are briefly explained below.

Rentability (output) rates. Commercial rantability: Commercial rantability is attained by dividing the pre-tax profit of the enterprise by its net sales. It indicates the significance level of the profit in sales revenue (Akdoğan & Tenker, 2001). This ratio helps managers in pricing the products (Ceylan & Korkmaz, 2006). In an enterprise, profit starts with the introduction of the difference between sales revenue and sales costs. Therefore the calculation and controlling of costs in a manner to maximize the profit is one of the most important conditions by which the enterprise may realize its goals (Dumanoğlu, 2005). Economic rantability: Economic rantability is attained by dividing the pre-tax profit of the enterprise by the amount of its average total assets. And average total asset amount is the average of total assets for the current and the previous year. It indicates to what degree the assets were used profitably. The asset usage efficiency of the enterprise may be determined by comparing this ratio with enterprise ratios (Lazol, 2005). Financial Rantability: Financial Rantability is attained by dividing the pre-tax profit of the enterprise by the amount of its average equity capital. And average equity capital amount is the average of equity capital amounts for the current and the previous year. The said ratio indicates the profit ratio per unit of the capital provided by the owner/owners of the company (Akguç, 2006).

Activity (input) ratios. Accounts receivable turnover rate: Accounts receivable turnover rate is found by dividing credit sales (sales revenue) of the enterprise by average receivables. Average receivables are the average
of trade receivables for the current and the previous term. It helps indicate the relation between turnover and receivables (Peker, 1983). Stock turnover rate: Stock Turnover Rate is calculated by dividing the cost of sold Goods (cost of sales) of the company by average inventories. Average stock is the average of the company stocks for the current and the previous term. This ratio indicates how long it takes for the goods to turn into sales revenue (Akdoğan & Tenker, 2001). Asset turnover rate: Asset turnover rate is found by dividing the sales of the enterprise by its average assets. Average assets represent total assets. This ratio indicates how many times the company assets turn over in a year to realize the turnover (Arat, 2005).

Results of DEA Models

Input-oriented CCR, input-oriented BCC and ADD models were applied for the abovementioned DMU and input-output ratios and following results were attained (see Tables 1 and 2).

Table 1

<table>
<thead>
<tr>
<th>DMU</th>
<th>Scores (%)</th>
<th>Reference sets and benchmarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>EFES</td>
<td>100</td>
<td>-</td>
</tr>
<tr>
<td>BANVİT</td>
<td>100</td>
<td>-</td>
</tr>
<tr>
<td>COLA</td>
<td>59.94</td>
<td>1(0.75); 2(0.05); 4(0.06)</td>
</tr>
<tr>
<td>DARDANEL</td>
<td>100</td>
<td>-</td>
</tr>
<tr>
<td>KENT</td>
<td>46.57</td>
<td>2(0.18); 4(0.06)</td>
</tr>
<tr>
<td>KEREVİTAŞ</td>
<td>74.95</td>
<td>2(0.13); 4(0.49)</td>
</tr>
<tr>
<td>PINARET</td>
<td>71.29</td>
<td>1(0.83); 4(0.15)</td>
</tr>
<tr>
<td>PINARSÜT</td>
<td>60.21</td>
<td>1(0.79); 4(0.11)</td>
</tr>
<tr>
<td>ŞEKER</td>
<td>90.00</td>
<td>1(0.19); 2(1.00)</td>
</tr>
<tr>
<td>TAT</td>
<td>40.91</td>
<td>2(0.23)</td>
</tr>
<tr>
<td>TUKAŞ</td>
<td>80.25</td>
<td>1(0.02); 2(0.15)</td>
</tr>
<tr>
<td>ULKER</td>
<td>58.22</td>
<td>1(0.47); 2(0.15); 4(0.03)</td>
</tr>
</tbody>
</table>

CCR model results. Efficiency rates and reference set of companies and weights obtained by CCR input-oriented DEA is given on Table 2. Companies with the efficiency level of 1 are considered efficient. According to this, EFES, BANVİT and DARDANEL were found to be the most efficient companies considering their activity and rantability rates. Reference set in the last column of the table indicates the reference set of the relevant company and weights of these companies.

Original values, target values of the company on input and output basis according to the CCR(I) model and improvement ratios calculated with these values are given in Table 3. Original values are input and output ratios and target values are calculated as follows. Only one input value of one enterprise is calculated to serve as an example.

For the company COLA. Because reference set of the company COLA is 1–2 and 4 (first, second and fourth enterprise), and their weights are 0.75–0.05 and 0.06 respectively; target value for Input 1 of the COLA enterprise is the total of 75% of the Input 1 of the first company, 5% of the Input 1 of the second company and 6% of the Input 1 of the fourth company and with this calculation, \((8.726 \times 0.75) + (8.617 \times 0.05) + (16.735 \times 0.06) = 7.979\) is obtained. Improvement ratios are the percentage value of the difference between the original values and target values. Accordingly, COLA enterprise can become efficient if it reduces its Accounts Receivable
Turnover Rate for 39%, Stock Turnover Rate for 45% and Asset Turnover Rate for 39%.

Table 2

**CCR(I) DEA Results – İyileştirme Tablosu**

<table>
<thead>
<tr>
<th>Enterprises</th>
<th>EFES</th>
<th>BANVİT</th>
<th>COLA</th>
<th>DARDANEL</th>
<th>KENT</th>
<th>KEREVİTAŞ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input 2</td>
<td>4.295</td>
<td>8.179</td>
<td>6.878</td>
<td>2.404</td>
<td>4.375</td>
<td>2.930</td>
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<td>Original values</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Output 1</td>
<td>0.160</td>
<td>0.151</td>
<td>0.106</td>
<td>0.382</td>
<td>0.052</td>
<td>0.160</td>
</tr>
<tr>
<td>Output 2</td>
<td>0.124</td>
<td>0.315</td>
<td>0.130</td>
<td>0.377</td>
<td>0.068</td>
<td>0.223</td>
</tr>
<tr>
<td>Output 3</td>
<td>0.278</td>
<td>0.657</td>
<td>0.232</td>
<td>0.158</td>
<td>0.109</td>
<td>1.017</td>
</tr>
<tr>
<td>Input 1</td>
<td>8.726</td>
<td>8.617</td>
<td>7.979</td>
<td>16.735</td>
<td>5.671</td>
<td>9.320</td>
</tr>
<tr>
<td>Input 2</td>
<td>4.295</td>
<td>8.179</td>
<td>3.774</td>
<td>2.404</td>
<td>1.616</td>
<td>2.241</td>
</tr>
<tr>
<td>Target values</td>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Output 1</td>
<td>0.160</td>
<td>0.151</td>
<td>0.150</td>
<td>0.382</td>
<td>0.050</td>
<td>0.206</td>
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<tr>
<td>Output 2</td>
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<td>0.315</td>
<td>0.130</td>
<td>0.377</td>
<td>0.079</td>
<td>0.225</td>
</tr>
<tr>
<td>Output 3</td>
<td>0.278</td>
<td>0.657</td>
<td>0.250</td>
<td>0.158</td>
<td>0.127</td>
<td>0.162</td>
</tr>
<tr>
<td>Improvement (%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Input 1</td>
<td>0</td>
<td>0</td>
<td>-0.390</td>
<td>0</td>
<td>-0.540</td>
<td>-0.240</td>
</tr>
<tr>
<td>Input 2</td>
<td>0</td>
<td>0</td>
<td>-0.450</td>
<td>0</td>
<td>-0.630</td>
<td>-0.230</td>
</tr>
<tr>
<td>Original values</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Output 1</td>
<td>0</td>
<td>0</td>
<td>-0.390</td>
<td>0</td>
<td>-0.660</td>
<td>-0.450</td>
</tr>
<tr>
<td>Output 2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.160</td>
<td>0.008</td>
</tr>
<tr>
<td>Output 3</td>
<td>0</td>
<td>0</td>
<td>0.070</td>
<td>0</td>
<td>0.160</td>
<td>-0.840</td>
</tr>
<tr>
<td>Improvement (%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Input 1</td>
<td>0</td>
<td>0</td>
<td>-0.430</td>
<td>0</td>
<td>-0.540</td>
<td>-0.240</td>
</tr>
<tr>
<td>Input 2</td>
<td>0</td>
<td>0</td>
<td>-0.450</td>
<td>0</td>
<td>-0.630</td>
<td>-0.230</td>
</tr>
<tr>
<td>Original values</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Output 1</td>
<td>0</td>
<td>0</td>
<td>-0.390</td>
<td>0</td>
<td>-0.660</td>
<td>-0.450</td>
</tr>
<tr>
<td>Output 2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.160</td>
<td>0.008</td>
</tr>
<tr>
<td>Output 3</td>
<td>0</td>
<td>0</td>
<td>0.070</td>
<td>0</td>
<td>0.160</td>
<td>-0.840</td>
</tr>
<tr>
<td>Input 1</td>
<td>9.752</td>
<td>8.776</td>
<td>10.274</td>
<td>1.981</td>
<td>1.467</td>
<td>5.895</td>
</tr>
<tr>
<td>Input 2</td>
<td>3.925</td>
<td>3.657</td>
<td>8.995</td>
<td>1.881</td>
<td>1.312</td>
<td>3.317</td>
</tr>
<tr>
<td>Target values</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Output 1</td>
<td>0.788</td>
<td>0.718</td>
<td>2.236</td>
<td>0.480</td>
<td>0.328</td>
<td>0.705</td>
</tr>
<tr>
<td>Output 2</td>
<td>0.190</td>
<td>0.168</td>
<td>0.181</td>
<td>0.034</td>
<td>0.025</td>
<td>0.109</td>
</tr>
<tr>
<td>Output 3</td>
<td>0.254</td>
<td>0.237</td>
<td>0.709</td>
<td>0.151</td>
<td>0.104</td>
<td>0.233</td>
</tr>
<tr>
<td>Improvement (%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Input 1</td>
<td>-0.680</td>
<td>-0.860</td>
<td>-0.100</td>
<td>-0.950</td>
<td>-0.570</td>
<td>-0.400</td>
</tr>
<tr>
<td>Input 2</td>
<td>-0.680</td>
<td>-0.630</td>
<td>-0.340</td>
<td>-0.580</td>
<td>-0.190</td>
<td>-0.680</td>
</tr>
<tr>
<td>Original values</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Output 1</td>
<td>-0.290</td>
<td>-0.390</td>
<td>-0.100</td>
<td>-0.680</td>
<td>-0.660</td>
<td>-0.410</td>
</tr>
<tr>
<td>Output 2</td>
<td>-0.010</td>
<td>-0.007</td>
<td>0.190</td>
<td>0.630</td>
<td>0.880</td>
<td>0.008</td>
</tr>
<tr>
<td>Output 3</td>
<td>0.220</td>
<td>0.170</td>
<td>-0.007</td>
<td>0.006</td>
<td>0</td>
<td>0.040</td>
</tr>
</tbody>
</table>

Table 3

**BCC(I) DEA Results–Efficiency Table**

<table>
<thead>
<tr>
<th>DMU</th>
<th>Scores (%)</th>
<th>Reference sets and benchmarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>EFES</td>
<td>100</td>
<td>-</td>
</tr>
<tr>
<td>BANVİT</td>
<td>100</td>
<td>-</td>
</tr>
<tr>
<td>COLA</td>
<td>65.57</td>
<td>1(0.83); 4(0.06); 11(0.10)</td>
</tr>
<tr>
<td>DARDANEL</td>
<td>100</td>
<td>-</td>
</tr>
<tr>
<td>KENT</td>
<td>81.18</td>
<td>2(0.07); 4(0.06); 11(0.87)</td>
</tr>
<tr>
<td>KEREVİTAŞ</td>
<td>85.11</td>
<td>2(0.07); 4(0.50); 11(0.43)</td>
</tr>
<tr>
<td>PINARET</td>
<td>72.05</td>
<td>1(0.85); 4(0.15)</td>
</tr>
<tr>
<td>PINARSÜT</td>
<td>65.81</td>
<td>1(0.94); 4(0.06)</td>
</tr>
<tr>
<td>ŞEKER</td>
<td>100</td>
<td>-</td>
</tr>
<tr>
<td>TAT</td>
<td>59.78</td>
<td>1(0.41); 11(0.59)</td>
</tr>
<tr>
<td>TUKAŞ</td>
<td>100</td>
<td>-</td>
</tr>
<tr>
<td>ÜLKER</td>
<td>75.31</td>
<td>1(0.61); 2(0.04); 4(0.05) 11(0.30);</td>
</tr>
</tbody>
</table>

**BCC model results.** Efficiency rates and reference set of companies and weights obtained by BCC input-oriented DEA is given on Table 4. According to this, EFES, BANVİT, DARDANEL, ŞEKER AND TUKAŞ were found to be the most efficient companies. If attended closely, while there are three efficient companies in CCR(I) model, in BCC(I) model two more companies were considered efficient in addition to these three.

Table 4

**BCC(I) DEA Results–Improvement Table**

<table>
<thead>
<tr>
<th>Enterprises</th>
<th>EFES</th>
<th>BANVİT</th>
<th>COLA</th>
<th>DARDANEL</th>
<th>KENT</th>
<th>KEREVİTAŞ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input 2</td>
<td>4.295</td>
<td>8.179</td>
<td>6.878</td>
<td>2.404</td>
<td>4.375</td>
<td>2.930</td>
</tr>
<tr>
<td>Input 3</td>
<td>0.772</td>
<td>2.090</td>
<td>1.229</td>
<td>0.988</td>
<td>1.311</td>
<td>1.388</td>
</tr>
<tr>
<td>Output 1</td>
<td>0.160</td>
<td>0.151</td>
<td>0.106</td>
<td>0.382</td>
<td>0.052</td>
<td>0.160</td>
</tr>
<tr>
<td>Output 2</td>
<td>0.124</td>
<td>0.315</td>
<td>0.130</td>
<td>0.377</td>
<td>0.068</td>
<td>0.223</td>
</tr>
<tr>
<td>Output 3</td>
<td>0.278</td>
<td>0.657</td>
<td>0.232</td>
<td>0.158</td>
<td>0.109</td>
<td>1.017</td>
</tr>
<tr>
<td>Input 2</td>
<td>4.295</td>
<td>8.179</td>
<td>3.872</td>
<td>2.404</td>
<td>2.140</td>
<td>2.478</td>
</tr>
<tr>
<td>Input 3</td>
<td>0.772</td>
<td>2.090</td>
<td>0.796</td>
<td>0.988</td>
<td>1.063</td>
<td>1.064</td>
</tr>
<tr>
<td>Output 1</td>
<td>0.160</td>
<td>0.151</td>
<td>0.158</td>
<td>0.382</td>
<td>0.056</td>
<td>0.212</td>
</tr>
<tr>
<td>Output 2</td>
<td>0.124</td>
<td>0.315</td>
<td>0.128</td>
<td>0.377</td>
<td>0.067</td>
<td>0.221</td>
</tr>
<tr>
<td>Output 3</td>
<td>0.278</td>
<td>0.657</td>
<td>0.231</td>
<td>0.158</td>
<td>0.126</td>
<td>0.169</td>
</tr>
</tbody>
</table>

**Improvement (%)**

<table>
<thead>
<tr>
<th>Enterprises</th>
<th>EFES</th>
<th>BANVİT</th>
<th>COLA</th>
<th>DARDANEL</th>
<th>KENT</th>
<th>KEREVİTAŞ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input 1</td>
<td>0</td>
<td>0</td>
<td>-0.350</td>
<td>0</td>
<td>-0.190</td>
<td>-0.150</td>
</tr>
<tr>
<td>Input 2</td>
<td>0</td>
<td>0</td>
<td>-0.430</td>
<td>0</td>
<td>-0.510</td>
<td>-0.150</td>
</tr>
<tr>
<td>Input 3</td>
<td>0</td>
<td>0</td>
<td>-0.350</td>
<td>0</td>
<td>-0.180</td>
<td>-0.230</td>
</tr>
<tr>
<td>Output 1</td>
<td>0</td>
<td>0</td>
<td>0.490</td>
<td>0</td>
<td>0.070</td>
<td>0.320</td>
</tr>
<tr>
<td>Output 2</td>
<td>0</td>
<td>0</td>
<td>-0.015</td>
<td>0</td>
<td>-0.014</td>
<td>-0.008</td>
</tr>
<tr>
<td>Output 3</td>
<td>0</td>
<td>0</td>
<td>-0.004</td>
<td>0</td>
<td>0.150</td>
<td>-0.830</td>
</tr>
</tbody>
</table>

(to be continued)
According to Table 5, when the calculations made for target values and improvement rates for COLA company in CCR(I) model is repeated, the following results are obtained.

For the company COLA. Because reference set of the company COLA is 1–4 and 11 (first, second and eleventh enterprise), and their weights are 0.83–0.06 and 0.10 respectively; target value for Input 1 of the COLA enterprise is the total of 83% of the Input 1 of the first company, 6% of the Input 1 of the second company and 10% of the Input 1 of the eleventh company and with this calculation, \((8.726 \times 0.83) + (16.735 \times 0.06) + (3.419 \times 0.10) = 8.588\) is obtained. Accordingly, COLA enterprise can become efficient if it reduces its Accounts Receivable Turnover Rate for 35%, Stock Turnover Rate for 43% and Asset Turnover Rate for 35%. It is seen that the ratios are close to each other in both models. Improvement ratios for BCC(I) model are given in Table 5 below.

**ADD Model results.** Apart from CCR(I) and BCC(I) models, ADD model was also applied to 12 DMUs and 3 input-3 output value, and because they are the same as those of the other two, the results of it are not contained here to avoid repetition. Enterprises that are found efficient as a result of three models can be seen all together in Table 5. If attended closely, efficient enterprises have come out the same in CCR(I) and ADD(C) models. It is normal that the results were the same, because there is CRS in the efficiency limit in the CCR model. Again, the results are the same in the BCC(I) and ADD(V) models.

### Table 5

#### Efficient Enterprises for All Models

<table>
<thead>
<tr>
<th>Model</th>
<th>Efficient Enterprises</th>
</tr>
</thead>
<tbody>
<tr>
<td>CCR(I)</td>
<td>EFES, BANVI, DARDANEL</td>
</tr>
<tr>
<td>BCC(I)</td>
<td>EFES, BANVI, DARDANEL, ŞEKER, TUKAŞ</td>
</tr>
<tr>
<td>ADD (C)</td>
<td>EFES, BANVI, DARDANEL</td>
</tr>
<tr>
<td>ADD(V)</td>
<td>EFES, BANVI, DARDANEL, ŞEKER, TUKAŞ</td>
</tr>
</tbody>
</table>

**Notes.** ADD(C): Constant returns to scale, ADD(V): Variable returns to scale.
Conclusion

There are several applications in question that the companies need to perform to improve their efficiency. Because they are in competition with other companies in the same field, they have to keep their efficiency values at the maximum. DEA method among these researches is a method which presents the efficiency of the company by comparing it with those of other companies. The company will come out as efficient or not. If not, DEA method helps determine what to do to improve the efficiency.

Values obtained as a result of DEA, are significant in terms of management, because these values give clues to which strategies it shall apply in order to raise the performance of each unit to the level of units that are above the efficiency limit and that have high performance. So, the enterprise management can evaluate which inputs its own unit has used excessively and in terms of which output its activities are insufficient. In the event that accounts receivable turnover rate is found to be low, the enterprises shall focus on its causes by using the results of analysis and take corrective measures by searching such causes as the market selling conditions, receivables without collectability or the low performance of the finance services. Similarly, in case the stock turnover rate is low, various causes can be detected such as stock with no collectability, coordination or productivity deficiencies of sale and purchase units and measures can be taken. Consequently, as a result of the analysis performed, the enterprises can evaluate their own activities in the sector they are engaged in, make observations and take measures to correct insufficient data.

According to CCR(I) method, Anadolu Efes Beer and Malt industry joint-stock company, Banvit Bandırma Vitamin bait industrial and commercial joint-stock company and Dardanel Food Industry joint-stock company are the most efficient companies among others. Other companies will have to make improvements to be efficient. However, according to the BCC(I) method, the number of efficient companies has increased and Şeker Chicken and Bait Industry joint-stock company and Tukaş Food Industry joint-stock company have been added to those above. According to the BCC(I) method, the efficiency of other inefficient companies is more than it is in CCR(I) method. This characteristic was also mentioned before. Efficient companies of ADD(C) are the same as those of CCR(I), and efficient companies of ADD(V) are the same as those of BCC(I).

DEA is a significant method in determining the efficiencies of units it named DMU. By this method, the unit can either measure its efficiency, and can see what it can do to be efficient. This study has been performed for only one year. By performing the same applications for more than one year, the efficiencies of enterprises for previous years can be handled in comparison.

References

COMPARISON OF EFFICIENCIES OF ENTERPRISES ENGAGED IN FOOD SECTOR


A Model of Interest Rate and Loan Covenant Competition

Erik Benrud
LeBow College of Business Drexel University, USA

This paper develops a model where two lenders to subprime borrowers compete with the interest rates charged and the severity of loan covenants. The model has a stable equilibrium, which demonstrates how an increase in the number of borrowers or an increase in the cost of meeting covenants will reduce the severity of the covenants required by lenders, and each of these changes will increase the difference in the severity of the loan covenant levels. An increase in the expected losses to the lender from relaxing covenants will increase the severity of loan covenants, and this will also make the levels of severity more dispersed. Additional analysis demonstrates how exogenous shifts affect the interest rates charged by the lenders and their profits.

Keywords: subprime borrowers, interest rate, loan covenant competition

Introduction

The purpose of this article is to introduce a model that described the competition between lenders to subprime borrowers. The lenders differentiate themselves by the interest rate charged and the severity of the loan covenants. The lenders’ profit functions include an expected loss function whose argument is the severity of loan covenants. The model also includes a borrower profit function in which one of the arguments is the severity of the loan covenant. The resulting model can help practitioners and researchers understand how the perceived risk of relaxing loan covenants, the number of borrowers, and borrowers’ costs of complying with a given level of severity of loan covenants can determine the interest rate charged and the severity of the loan covenants.

Given the recent financial upheaval, lenders are reassessing the covenants they require of borrowers. Our model examines how lenders might differentiate themselves with respect to the interest rates charged and the severity of the loan covenants. The model contributes to the literature on bank competition that has grown substantially with the deregulation trends that began in the 1980s. Early examples are Matutes and Padilla (1994) who modeled banks’ choices of geographical reach and loan pricing and Degryse (1996) who examined the competition for deposits.

The model in this paper is an adaptation of a general model developed by Anderson, de Palma, and Thisse (1992). That is now an established model in the industrial organization literature, and it describes a duopoly market where the firms avoid direct competition by offering products with different qualities and prices. We build upon that model by including three lenders that offer loans with different severity of loan covenants to avoid direct competition. There is one lender who offers only fully secured loans and two lenders who offers loans with less severe covenants. The latter two will be referred to as “subprime lenders”. The subprime lenders

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avoid direct competition by differentiating themselves with respect to the severity of the covenants they require and the interest rate they charge borrowers.

The model determines the market share, profits, and equilibrium severity of loan covenant levels in terms of exogenous parameters such as the expected loss associated with the severity of loan covenants (SLC), the number of borrowers, the cost of borrowers to comply with the covenants, and macroeconomic risk. The model demonstrates that when the cost of complying with covenants increases (decreases), the SLCs will decrease (increase) and diverge (converge). When decreasing the severity of loan covenants has a larger (lower) impact on expected losses, however, the SLCs will increase (decrease) and diverge (converge).

The review of the literature in the next section provides the sources of the theories and assumptions used in this model. After that section, we introduce the parameters within the framework of a market where there is one lender who only makes fully secured loans and a second lender who offers loans with less severe covenants at a higher interest rate (i.e., one subprime lender). After that, we expand the model to include a second lender who offers loans with less severe covenants. Then, there is a section that employs comparative statics to demonstrate the implications of the model, which is followed by summary and discussion.

Models of Quality Competition

Models analyzing the effects of quality competition are important because a larger variety of products available to consumers improves economic welfare (Mussa & Rosen, 1978; Anderson et al., 1992). Furthermore, new entrants will always try to find their own market niche, and that niche may be defined in terms of quality. Previous researchers have verified how it is often too costly for monopolists offering a given quality of goods to prevent entrants with a different quality product from entering the market (Dixit, 1980; Schwartz & Thompson, 1986; Schwartz & Baumann, 1987). This section summarizes the development of the economic and finance literature that explores the dynamics and effects of this competitive process.

Over the years, a large literature has built upon early works such as Leland (1977) and Shaked and Sutton (1982) to show how quality differentiation relaxes price competition. The reason for such differentiation is to avoid the Bertrand (1883) outcome associated with firms that compete with the same quality product. Researchers have created the moniker “Bertrand death” to describe a competitive situation where prices are falling and production costs are increasing. In the resulting equilibrium, the firms have non-positive profits (Anderson et al., 1992). According to Sutton (1997), “loss-making strategies will be avoided” by firms; also, “if a profitable opportunity exists in the market, there is ‘one smart agent’ who will fill it.” Rather than risking a competitive outcome where profits are non-positive, the entering firm can choose a quality that is different enough to allow it to not directly compete with the existing firm.

There is a lengthy literature on the entry of firms into industries where profit opportunities exist. Prescott and Visscher (1977) and Hay (1976) pioneered the modern sequential-entry models. Lane (1980) extended the model to allow for endogenous prices, and this development has characterized later models including the one in this paper. Subsequent works in this area include Shaked and Sutton (1982), Bernheim (1984), Harris (1985), Eaton and Ware (1987), Dewatripont (1987), Benoit and Krishna (1987), Vives (1988), Mclean and Riordan (1989), and Anderson et al. (1992).

The model here builds upon the model established in Anderson et al. (1992), henceforth “ADT”. The ADT
model is a vertical differentiation model with a stable and tractable equilibrium. Furthermore, the consumer utility function of the ADT model easily adapts to a profit function of a borrower who pays an interest rate and must incur a cost to comply with loan covenants.

As Sutton (1997) mentioned, there is usually not one “true model” to describe a given market. Several models may apply. This paper lays a solid foundation for future work in this area by thoroughly investigating the results associated with the modification of an established spatial model in the industrial organizations literature. In our model, the second-order conditions are satisfied, and the model yields a unique and stable equilibrium. Having successfully adapted one model from the industrial organizations literature to the market for loans with differing severity of loan covenant levels, future research can explore the extent to which other models apply.

The next section summarizes the assumptions of the ADT model, modifies that model so that its inputs correspond to parameters in the market for borrowed funds. That section lays the groundwork for the sections that describe a subprime duopoly lending market characterized by vertical product differentiation and how lenders adjust severity of loan covenants and interest rates in reaction to changes in exogenous parameters.

A Single Subprime Lender Market

This section serves two purposes. It introduces the parameters of the market and the corresponding simplifying assumptions of the model. It also describes the model’s equilibrium with only one lender offering loans with a low severity of loan covenant (SLC) at a higher interest rate. There is also a lender who only makes loans with an SLC sufficient to make the loans fully secured. The equilibrium is a standard result, but it sets the stage for examining the results when there are two subprime lenders competing for loans that are not fully secured.

As mentioned earlier, our model builds upon the ADT model, which only has two firms competing with quality. In our full model, borrowers have three choices. The borrowers can choose to meet some high level of SLC, which make the loans fully secured with a low interest rate, or they can choose between two other lenders offering loans with lower but different SLCs and correspondingly higher interest rates. Before introducing that three-lender market, we first consider a case where there is only one low SLC lender.

To describe how the borrowers make their choices, we adapt the indirect utility function of consumers used by ADT. The indirect utility function in the ADT model has income, price, taste and quality which are represented by \( y, P_i, \theta \), and \( q_i \), respectively:

\[
V_i(\theta) = y - P_i + \theta q_i \quad (i = 1, \ldots, n)
\]

Each period, consumers purchase and consume a single unit of the product indexed \( i \). The price and quality of the product are \( P_i \) and \( q_i \), respectively. The increase in utility from consuming the product depends on each agent’s unique preference factor denoted \( \theta \). Preferences follow a uniform distribution over an interval bounded by a lower and upper value of \( \theta \). The quality levels have this relationship: \( q_L < q_H \). The symbol \( q_H \) represents the quality level offered by the high-quality producer or the monopolist in the single-seller case. In the duopoly market, the low-quality producer offers \( q_L \). The net benefit of consuming product variety \( i \) is given by the quantity \( \theta q_i - P_i \).

Using the same basic concept, we propose the following profit function of the borrower:

\[
V(\kappa) = Y - R_i - \kappa \sigma_i \quad (i = 1, \ldots, n)
\]
where

\( Y \): The level of return expected from investing the proceeds of the loan;
\( R_i \): The interest rate charged on the loan;
\( \kappa \): The covenant cost factor that determines the cost of complying with a given SLC;
\( \sigma_i \): The severity of the covenants or SLC.

Each borrower takes the same size loan, and they invest the proceeds in an endeavor that will produce a positive return, \( Y \), either in the form of direct profit and capital gains in the case of a business loan or the elimination of rental payments in the case of a home loan. The interest rate consists of two portions: \( R_i = r_0 + r_i \).

The term \( r_0 \) is the rate charged on a loan where the SLC is high enough to make the loan essentially free of idiosyncratic risk; therefore, for loans with \( \sigma_0 \), \( R_0 = r_0 \). The term \( r_i \) is the premium charged for reducing the SLC to a level \( \sigma_i < \sigma_0 \), where \( \sigma_0 \) represents the SLC that make a loan free of idiosyncratic risk. We assume that that \( R_0 \), the interest rate for loans without idiosyncratic risk, is exogenously determined.

The borrowers choose a particular interest rate and SLC to maximize profits given the costs they incur from meeting the SLC, which depends upon the cost factor \( \kappa \). In a case where there is just one subprime lender, the borrowers have the choice between \( \sigma_0 \) and paying the basic rate \( R_0 \) and paying the higher \( R_1 \) for LCS \( \sigma_1 \). Borrowers characterized by \( \kappa > r_1 / (\sigma_0 - \sigma_1) = \kappa^* \) will choose to pay \( R_1 \) for only facing \( \sigma_1 \). In other words, borrowers with a higher value of \( \kappa \) are willing to pay the higher interest rate to reduce the SLC.

As assumed in the ADT model and many other models of this type, \( \kappa \) is uniformly distributed. The lower bound on \( \kappa \) is zero, and there is an upper bound, which we denote \( K \). The value of the density function over zero to \( K \) is the number of potential borrowers divided by the upper limit of the covenant cost factor. Letting \( N \) represent the number of borrowers and \( \phi(\kappa) \) represent the density function, we can write \( \phi(\kappa) = N/K \) when \( 0 < \kappa < K \), else \( \phi(\kappa) = 0 \). At this point we assume that \( Y \) is sufficiently high so as to exceed both the interest rate and the costs of adhering to the loan covenants. Future research will examine the implications of the possibility of \( Y < R_i + \kappa \sigma_i \).

Lenders face an expected cost loss function based upon the severity of the covenants:

\[
E(\text{loss}\mid \sigma_j) = \xi (\sigma_0 - \sigma_j)^2
\]  

For the lender that makes loans with \( \sigma_0 \), the expected loss is negligible. The low SLC lender will incur higher expected losses by lowering the SLC by the distance given by \( (\sigma_0 - \sigma_j) \). There is a scale factor \( \xi \) that varies with the state of the economy, and there is an increasing expected loss from each unit increase in \( (\sigma_0 - \sigma_j) \).

The profit functions are:

\[
\pi_0 = \frac{N}{K}(K-\kappa^*)R_0
\]
\[
\pi_1 = \frac{N}{K}(K-\kappa^*)R_1 - \xi (\sigma_0 - \sigma_1)^2
\]

The interest rate and SLC are determined by the economy. The lender offering loans with SLC \( \sigma_j \) makes a choice of the interest rate to charge and the value of \( \sigma_j \). Substituting \( \kappa^* \) into the profit function of that lender and optimizing with respect to the interest rate gives this expression for the optimal rate: \( R_1^* = r_0 + K(\sigma_0 - \sigma_1)/2 \). Using the assumed distribution of \( \kappa \) gives the following expression:

\[
\kappa^* = \frac{K(\sigma_0 - \sigma_1)/2}{(\sigma_0 - \sigma_1)} = K/2
\]

1 The cost function can also be interpreted as being determined by the number of loans made since the distance \( (\sigma_0 - \sigma_1) \) also determines the number of loans the low SLC lender makes.
This is a standard result in a market where only one firm makes price and quality or quantity decisions. It is immutable with respect to the choices of interest rate and SLC and the lender’s expected loss function.

Exogenous parameters determine the values for $R_1$ and $\sigma_1$ the subprime lender can choose to maximize $\pi_1$. The first-order conditions provide the solution for the optimal $\sigma_1$. The subprime lender is willing to lower the SLC below $\sigma_0$ by the amount: $\sigma_0-\sigma_1 = 0.125NK/\xi$. This expression can be rearranged to give the solution for the optimal $\sigma_1$

$$\sigma_1 = \sigma_0-0.125NK/\xi$$

Other things equal, a unit increase/decrease in $\sigma_0$ will increase/decrease $\sigma_1$ by an equal amount. The absolute difference in SLCs increases when $N$ or $K$ increases. Naturally, the subprime lender finds it profitable to accommodate an increase in the costs of borrowers to meet loan covenants by distinguishing its product more from $\sigma_0$. Likewise, since $d\sigma_1/d\xi = 0.125NK/\xi^2>0$, the lender will increase SLC when the expected loss parameter $\xi$ increases. Since the low SLC lender will always lend to $K/2$ investors, an increase in $K$ motivates the lender to lower the SLC. An increase in $N$ increases the marginal revenue from a given increase in $R_1$, and the lender will lower $\sigma_1$.

The optimal interest rate is $R_1 = r_0 + 0.0625NK^2/\xi$. The profit of the subprime lender is $\pi_1 = 0.015625(NK)^2/\xi$, and $d\pi_1/dK > 0, d\pi_1/dN > 0, d\pi_1/d\xi < 0$. A higher cost of meeting loan covenants and a larger population of borrowers increase profits. An increase in the expected loss from a given lowering of the LCS lowers profits.

These results hold when $\kappa$ follows a distribution other than the uniform distribution. A cumulative distribution function, denoted $\phi(\kappa)$, can help create a more general expression for profit:

$$\pi_1 = NR_1\{1-\phi[R_1/(\sigma_0-\sigma_1)]\} - \xi(\sigma_0-\sigma_1)^2$$

Optimal fee, given $\kappa^*$, is $R_1^* = r_0 + [1-\phi(\kappa^*)]/[(\sigma_0-\sigma_1) - \phi(\kappa^*)]$, which then gives the expression: $\kappa^* = [1-\phi(\kappa^*)]/\phi(\kappa^*)$. The value of $\kappa^*$ is a constant nominal value for many distributions. Unique solutions exist for $\kappa^*$ and the second-order conditions are satisfied when $\phi(\kappa)$ represents a uniform, normal or exponential distribution.

The results developed in this section are straightforward and conform to intuition. The goal of this section has been to demonstrate the results of the model in the relatively simple case of a single lender that can choose its level of SLC and interest rate competing with a lender who can only make loans free of idiosyncratic risk with an exogenously determined SLC. The next section investigates the results when a second lower SLC lender enters the market offering borrowers more choices of SLC and interest rate combinations.

**Competition Between Two Subprime Lenders**

To describe the interaction of the lower and lowest SLCs (i.e., the competing subprime lenders), we use the widely used assumption that lenders engage in a quality-then-price two-stage game. In this case the lenders choose the SLC level first then the interest rate. Representative works in this area include Tirole (1988), Jehiel (1992) and Xavier (1996). The model developed here has a stable equilibrium that defines the market share, interest rates, SLC levels, and profits of the lenders in terms of the external parameters defined in the previous section.

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2 The first derivative is $d\pi_1/d\sigma_1 = -(R_1^2/4) + 2\xi(\sigma_0-\sigma_1)$. The second-order condition is satisfied: $d^2 \pi_1/d(\sigma_1)^2 = -2\xi$.

3 There are distributions for which $\kappa^*$ is not unique. One example is $\phi(\kappa) = 1-K/\kappa; \kappa/\{K+\kappa\}$, where $K$ is a positive constant.
In the first stage of the game, the competitors recognize how their choices of \( \sigma_i \) determine market shares. The two subprime lenders offer distinct SLC levels as characterized by \( \sigma_j > \sigma_i \) and \( R_j < R_i \). Henceforth, the terms “lender 1” and “lender 2” refer to the higher and lower covenant severity levels respectively.

Recalling Equation (2), the condition that leads a borrower to choose the higher SLC of the two lower SLC lenders is \(-\frac{\kappa \sigma}{\omega} > R_j - R_i\). The preference factors for the marginal borrowers are:

\[
\kappa_i^* = \frac{(R_j - R_i)}{(\sigma_j - \sigma_i)} = \frac{(r_2 - r_1)}{(\sigma_2 - \sigma_1)} \tag{9}
\]

\[
\kappa_i^* = \frac{(R_i - R_j)}{(\sigma_i - \sigma_j)} = \frac{r_1}{(\sigma_i - \sigma_j)} \tag{10}
\]

The term \((N/K)(K-\kappa_j^*)\) indicates the number of traders who take out loans with the lowest SLC from lender 2. The corresponding measure for lender 1 is \((N/K)(K-\kappa_i^*)\). Solving for each \( R_i^* \) as before yields,

\[
R_2^* = r_0 + 2K(\sigma_j - \sigma_i)/(\sigma_j + \sigma_i - 4\sigma_j) \tag{11}
\]

\[
R_1^* = r_0 + K(\sigma_j - \sigma_i)/(\sigma_j + \sigma_i - 4\sigma_j) \tag{12}
\]

For ease of notation we write \( R_2^* = r_0 + 2K\delta_1,2\delta_0,2/\omega \) and \( R_1^* = r_0 + K\delta_0,2\delta_1,2/\omega \). The implied transformations are \( \delta_{0,2} = \sigma_0 - \sigma_2, \delta_{0,1} = \sigma_0 - \sigma_1, \delta_{1,2} = \sigma_1 - \sigma_2, \omega = 3\sigma_0 + \sigma_1 + \sigma_2 \).

The profit functions in the first stage of the game are:

\[
\pi_2 = 4NK\delta_{1,2}\delta_0,2/\omega^2 - \xi(\sigma_0 - \sigma_2)^2 \tag{13}
\]

\[
\pi_1 = NK\delta_0,2\delta_{1,2}^2/\omega^2 - \xi(\sigma_0 - \sigma_1)^2 \tag{14}
\]

The first-order conditions for lenders 2 and 1 respectively are:

\[
\xi = 2NK\sigma_0(2\delta_0,2 - 3\delta_1,2 - 4\delta_2,0)/(2\delta_0,2) \tag{15}
\]

\[
\xi = NK\delta_0,2(4\delta_0,2 - 7\delta_1,0)/(2\delta_0,2) \tag{16}
\]

Equating the two expressions for \( \xi \) gives a third degree polynomial in a variable defined as \( \delta_0,2/\delta_1,1 \). Only a single real root exists: \( \delta_{0,2}/\delta_{1,1} = 5.25123 \). Entering this value into the equations above yields solutions for the relaxation of the respective SLCs:

\[
\delta_{0,2} = \sigma_0 - \sigma_2 = 0.12665NK/\xi \tag{17}
\]

\[
\delta_{0,1} = \sigma_0 - \sigma_1 = 0.02412NK/\xi \tag{18}
\]

These expressions define several interesting relationships. Using the term \( NK/\xi \) as a unit of measure, for example, lender 1 relaxes the SLC from \( \sigma_0 \) to \( \sigma_1 \), but that distance is less than one fifth the distance of \( \sigma_0 - \sigma_2 \). If both lenders offer the optimal SLCs, their market shares are invariant in this model.

The interest rates are \( R_2 = r_0 + 0.05383NK^2/\xi \) and \( R_1 = r_0 + 0.00513NK^2/\xi \). Profits per period are \( \pi_2 = 0.0122193NK^2/\xi \) and \( \pi_1 = 0.0005075NK^2/\xi \). It is interesting to note that lender 2 earns the higher profit, but this depends upon our assumption that \( Y > R_1 + \kappa \alpha \) for all the lenders (i.e., the lender’s interest rate and the SLC are not so high to eliminate some possible borrowers with high values of \( \kappa \)).

The competition forces interest rates on the subprime loans to decline. The rate \( R_2 \) in the three lender case is about 14% lower than \( R_1 \) in the case where there were only the lender who makes fully secured loans and a single lower SLC or subprime lender. The corresponding SLC declines by about one percent. These adjustments increase that lender’s market share to 52.5%. Lender 2 serves 26.25% of all potential borrowers. The remaining 21.25% borrowers choose \( R_0 \) and \( \sigma_0 \). These market shares are immutable as long as all lenders remain in the market and \( \xi \) is the same for both low SLC lenders.

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4 We should note that the “lender 1” may not be the incumbent. In other words, when the second lender tries to enter, the incumbent may position itself to offer \( \sigma_i \) and \( R_i \).

5 The first-order conditions yield reaction functions in the plane defined by \( \sigma_i \) and \( \sigma_j \). The first order conditions give:

\[
\sigma_j = 5.25123\sigma_i - 2.52123\sigma_i^2 \text{ therefore when an equilibrium combination of } \sigma_i \text{ and } \sigma_j \text{ exists, it is unique.}
\]

The second-order conditions are satisfied:

\[
d^2 \pi_i/d\sigma_j^2 = -8NK(\delta_{0,1} + 5\delta_{0,2} - \delta_{0,2})/\omega < 0;
\]

\[
d^2 \pi_i/d\sigma_j^2 = -2NK(7\delta_{0,1} + 8\delta_{0,2}/\delta_{0,2})/\omega < 0.
\]
This section has summarized the basic vertical differentiation model in a duopoly market for low SLC lenders. The model builds upon that proposed by ADT by offering the borrowers three choices and by redefining the parameters so the model can apply to competition between lenders. Under these conditions, an equilibrium exists that is characterized by a unique set of SLCs, interest rates, profits and market shares. The next section examines how changes in exogenous parameters affect that equilibrium.

How Exogenous Shifts Affect Severity of Loan Covenants and Interest Rates

This section examines how changes in exogenous parameters affect the equilibrium derived in the previous section. Comparative statics yield interesting results with respect to how the equilibrium SLC levels, interest rates and profits react to changes in $\sigma_0$, $\xi$, $N$, and $K$. Respectively, these parameters relate to the severity of loan covenants needed to eliminate idiosyncratic risk, a scale parameter for the expected losses from lowering the SLC, the number of borrowers, and the costs the borrowers incur from complying with the covenants.

The comparative statics reveal the conditions that lead to changes in the level and distribution of the SLCs offered by the lower SLC lenders. The results in the previous sections yield the following expressions for quality levels:

$$\sigma_2^2 = \sigma_0^2 - \frac{0.12665NK}{\xi}$$
$$\sigma_1^2 = \sigma_0^2 - \frac{0.02412NK}{\xi}$$

Thus, when $\sigma_0$ changes, both lower SLC levels change an equal amount. An increase in $\sigma_0$ would correspond to a more risky environment as the level of SLC to eliminate idiosyncratic risk increases.

Macroeconomic variables would determine the value of $\sigma_0$.

Lender 2’s SLC is more sensitive to changes in risk aversion:

$$\left|\frac{d\sigma_2}{dK}\right| = \frac{0.12665N}{\xi^2} > \left|\frac{d\sigma_1}{dK}\right| = \frac{0.02412N}{\xi^2} \quad (19)$$

Given a fixed number of potential borrowers, an increase in $K$ implies that the borrowers incur higher costs for complying with the loan covenants. The equilibrium conditions imply that an increase in $K$ will decrease the SLC, profit and interest rate more for lender 2 than for lender 1. The choice variables for lender 1 are less responsive because lender 0 offers the immutable choice of $R_0$ and $\sigma_0$. If $K$ falls, the lenders will allow $\sigma_1$ and $\sigma_2$ to increase, but lender 1 cannot allow $\sigma_1$ to increase too much because $\sigma_0$ does not change. In summary, an increase (decrease) in $K$ decreases (increases) both $\sigma_1$ and $\sigma_2$, the quantity $\sigma_1 - \sigma_2$ increases (decreases), interest rates diverge (converge) and profits diverge (converge).

Since the term $(NK)$ appears in the expressions for interest rates, profits, and SLCs, it should be obvious that an increase in the number of borrowers will affect the equilibrium in basically the same way as an increase in $K$. With a larger number of borrowers in each of their market shares, lenders find that they can increase profits by decreasing the SLCs and the interest rate.

The SLCs offered by lender 1 and lender 2 will converge in reaction to an increase in the expected loss factor $\xi$:

$$\sigma_2^2/d\xi = 0.12665NK/\xi^2 > d\sigma_1^2/d\xi = 0.02412NK/\xi^2$$

But $d(\sigma_2 - \sigma_1)/d\xi = -0.10253NK/\xi^2$. The reason for the convergence of SLCs in response to an increase in the cost factor is that lender 1 cannot allow its SLC to get too close to $\sigma_0$. Nevertheless, since lender 2 has much higher expected losses, the scale factor for costs will have a much larger effect on lender 2’s profits and interest rates. Compared to lender 1, the increase in $\xi$ will lower the profits and interest rates of lender 2 more in absolute terms. In summary, with respect to the SLCs, an increase (decrease) in $\xi$ will increase (decrease) both $\sigma_1$ and $\sigma_2$, and the quantity $\sigma_1 - \sigma_2$ decreases (increases). An increase (decrease) in $\xi$ will decrease (increase)
profits and the absolute difference between the profit levels will decrease. Interestingly enough, an increase (decrease) in $\xi$ will decrease (increase) interest rates as the lenders increase the SLCs, and the absolute difference between the interest rates will decrease.

In all cases, when an exogenous shift increases (decreases) interest rates, the absolute difference between the interest rates increases (decreases). The same is true for profits. The more interesting result is how the difference in the SLCs depends on exogenous parameters. Although the SLC levels move in the same direction in reaction to a change in a given exogenous variable, whether the SLC levels diverge or converge depends on which exogenous variable brought about the change. Whether these relationships are realistic is the subject of future research as discussed in the next section.

Discussion

This paper demonstrates a methodology for analyzing how lenders willing to make more risky loans with less severe loan covenants can compete with different levels of severity of loan covenants (SLCs). Future research can build on the model here which describes the relationship between a two subprime lenders (i.e., lenders who offer different levels of lower SLCs). Previous research supports the proposition that a second firm can enter the market if it chooses to produce a product of a different quality, and the existence of a variety of qualities in various financial products (e.g., brokerage services and trading platform accuracy), supports this proposition. Our model demonstrates how the market forces determine interest rates, SLC levels, and profits in a market where there are three lenders of which two choose to offer the lower SLC loans.

As market forces change, the SLC levels offered by each lender will change but by different amounts. Future empirical research can test the relevancy of the model’s outcomes such as the relative sensitivities of the interest rates and SLC levels. Future research can also explore how the competition also lowers industry profits, which should increase social welfare.

These results provide a foundation for both theoretical and empirical research. Future work will relax assumptions concerning the distribution of the covenant cost factor and allow the return, $Y$, the borrowers plan to earn on their investment to vary across investors and even fall below a range of values $(R_i + \kappa \sigma_i)$, where $\kappa < \kappa_0$. Although game-theory models can become very complex, continued work in this field will allow researchers and practitioners to better understand the evolving market for financial services such as the market for loans with different severity of loan covenants.

References


Enhancing Innovation Through Intellectual Capital: A Theoretical Overview

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Innovation is one of the main drivers of economic development. In the knowledge economy era, the quickness of technological developments and globalization has changed the structure of business world. Consequently, this situation creates opportunities and also threats for companies. Companies should attach importance to innovation in order to maintain sustainable growth and gain competitive advantage. According to Barsky and Marchat (2000) in the new economy the value of a company is not found with its tangible assets, revenues, financial ratios or market share, but with its intellectual capital, organizational culture, customer loyalty and brand equity. According to resource-based view of the company; the resources are fundamental factors of competitiveness and performance. These resources are regarded as strategic assets, which include tangible and intangible assets. Intellectual capital which is becoming one of the important commercial assets of the 21st century is a way of describing a company’s intangible assets that are vital for company success. Intellectual capital consists of human capital, relational capital and structural capital. Intellectual capital which is a core strategic resource of a company is playing a crucial role in a company’s innovation performance. This study attempts to analyze the interrelationships between intellectual capital and innovation in the context of resource-based view of the company. This study also focuses in particular on the effects of human capital, relational capital and structural capital which are the components of intellectual capital, on innovation by integrating the relevant theoretical and empirical evidence.

Keywords: innovation, intellectual capital, resource-based view

Introduction

According to Thomas L. Friedman, the globalization is in the third stage and work has become global knowledge work (Ichijo & Nonaka, 2007). In other words today we are in knowledge economy era. According to Drucker (1993) in the new economy, knowledge is the only meaningful resource. The traditional factors of production—land, labour and capital—have not disappeared but they become secondary. It is clear that in the knowledge economy, innovation which means the use of new technological and market knowledge to offer a new product or service that customers will require (Afuah, 2003) is playing a crucial role in gaining competitive advantage and maintaining sustainable growth for companies. Innovation is also necessary for long term survival of companies. In the new economy the value of a company is not found with its tangible assets, revenues,
financial ratios or market share, but with intellectual capital, organizational culture, customer loyalty and brand equity (Barsky & Marchant, 2000). According to resource-based view of the company, the resources are fundamental factors of competitiveness and performance. These resources are regarded as strategic assets, which include tangible and intangible assets. Resource-based view of the firm views intangible assets as the main source of firm remarkable performance, because intangibles are rare, valuable, non-substitutable and mostly inimitable. Intangible assets are capable of generating sustainable competitive advantage and superior financial performance (Barney, 1991). Intangibles are currently the value drivers of a company and the most valuable assets (Stewart, 1997; Halawi, Aronson, & McCarthy, 2010). Intellectual capital which is becoming one of the important commercial assets of the 21st century is a way of describing a company’s intangible assets that are vital for company success (Brooking, 1996). Intellectual capital is playing an increasingly significant role in creating corporate wealth and growth (Lew & Zarowin, 1999). The term intellectual capital can be used interchangeably with intangibles, knowledge or knowledge resources (Fletcher, Guthrie, Steane, Roos, & Pike, 2003). Intellectual capital is the main factor in a company’s future earning potential and its capability to innovate, has an important effect on the business performance and success and gives to companies a better competitive position (Hall, 1992; Stewart, 1997; Subramaniam & Youndt, 2005). It is also widely accepted that intellectual capital is associated with a firm’s innovative performance (Subramaniam & Youndt, 2005; Wu, Chang, & Chen, 2008; Zerenler, Hasiloglu, & Mete, 2008).

The main purpose of this study is to analyze the interrelationships between intellectual capital and innovation in the context of resource-based view of the company.

The paper is organized as follows. First, resource-based view literature is provided. This is followed by a brief overview of the intellectual capital and innovation literature. This leads to an integration of intellectual capital and innovation performance. Finally conclusion part is provided.

Resource-Based View of the Firm

The resource-based view has become one of the most influential and cited theories in the history of management theorizing. It aspires to explain the internal sources of a firm’s sustained competitive advantage (Kraaijenbrink, Spender, & Groen, 2010). It was Penrose who established the foundations of the resource-based view as a theory (G. Roos & J. Roos, 1997). Penrose first provides a logical explanation to the growth rate of the firm by clarifying the causal relationships among firm resources, production capability and performance. Her concern is mainly on efficient and innovative use of resources. She claimed that bundles of productive resources controlled by firms could vary significantly by firm, that firms in this sense are fundamentally heterogeneous even if they are in the same industry (Barney & Clark, 2007). Wernerfelt (1984) took on a resource perspective to analyze antecedents of products and ultimately organizational performance and believed that “resources and products are two sides of the same coin” and firms diversify based on available resources and continue to accumulate through acquisition behaviors.

Barney (1991) provided the most influential framework of competitive advantage-creating resource characteristics. Beginning with two fundamental assumptions of resource heterogeneity and immobility, he established a VRIN—valuable, rare, imperfect limitability, non substitutability—framework. By establishing a connection between sustainable competitive advantage and resources, his claim is that only valuable, rare, inimitable and non-substitutable resources can entail sustainable competitive advantage. VRIN framework is
explained in Figure 1.

Assets that are valuable, rare, imperfectly immobile and inimitable are sources of sustainable competitive advantage. To this effect, innovation is an essential factor in the sustention of a competitive advantage (Levin, Cohen, & Mowery, 1985; Teece, 1988). Leidner (2001) argued, innovation should be promoted according to resource based theory (Halawi et al., 2010). The product of an innovation is the generation of new combinations of assets of high value, specifically related to the company (McGrath, Tsai, Venkataraman, & MacMillan, 1996). By implementing innovations, companies establish a flow of resources that leads to the creation of stocks of specific assets that other companies will be unable to quickly imitate (Dierickx & Cool, 1989).

To sum up, resource based view theory provides arguments for intangibles as a basis for firm competitive advantage. Particularly intellectual capital is generally considered to be a vital strategic asset (Mouritsen, 1988). Resource-based theory has been developed to understand how organizations achieve sustainable competitive advantage. Sustainable competitive advantage is no longer rooted in physical assets and financial capital, but management of intellectual capital (Halawi et al., 2010). There is a spate of recent research derived from resource based view that attempts to label the different resources within the firm and introduce the concept of intellectual capital which consists of structural capital, relational–customer-capital and human capital (Stewart, 1997; Edvinsson & Malone, 1997; Bontis, 1998).

**Intellectual Capital**

Early studies about intellectual capital were made by John Kenneth Galbraith. In 1969 Galbraith wrote a letter and sent to the economist and writer Michael Kalecki, and mentioned about how important intellectual capital is. In his letter he stated that “I wonder if you realize how much those of us the world around have owed to the intellectual capital you have provided over these last decades” (Bontis, 2001).

Consensus is lacking on a clear international accepted definition of intellectual capital (Nazari & Herremans, 2007). But there are various definitions of intellectual capital in the literature.

In 1991, Stewart used the term intellectual capital in his article which was published in Fortune 500, he defined intellectual capital as “the intellectual material that has been formalized, captured and leveraged to produce a higher-valued asset”. Brooking (1996) described intellectual capital as the “combined intangible assets which enable the company to function”. In other words, we can say that she defines a company, as the sum of its tangible assets and its intellectual capital. Low and Kalafut (2002) also defined intellectual capital as intangible assets which include technology, customer information, brand name, reputation and corporate culture which are indispensable for a company’s competitive power.

Edvinsson and Malone (1997) defined IC as “the possession of knowledge, applied experience, organizational
technology, customer relationships and professional skills that provide a competitive edge in the market”.

According to Stewart (1997), intellectual capital is the sum of collective knowledge, information, technologies, intellectual property rights, experience, organizational learning and competence, team communication system, customer relations, and brands which creates value for a company, and the “sum of everything everybody in your company knows that gives you competitive edge in the market place”.

G. Roos and J. Roos (1997) examined the intellectual capital in the perspectives of resourced-based view and they define intellectual capital as the sum of invisible, hidden assets and they note that intellectual capital is the most important resource in order to gain competitive advantage.

Bontis (1998) clarified intellectual capital as a combination of human capital, structural capital and customer/relational capital. Generally these components of intellectual capital are embraced by many researchers (See Table 1).

Table 1

<table>
<thead>
<tr>
<th>Authors</th>
<th>Important elements of intellectual capital</th>
<th>Description of elements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annie Brooking (UK)</td>
<td>(1) Human-centred assets</td>
<td>Skills, abilities and expertise, problem solving abilities, leadership styles</td>
</tr>
<tr>
<td></td>
<td>(2) Infrastructure assets</td>
<td>All the technologies, processes and methodologies that enable company to function</td>
</tr>
<tr>
<td></td>
<td>(3) Intellectual property</td>
<td>Know-how, trademarks and patents</td>
</tr>
<tr>
<td></td>
<td>(4) Market assets</td>
<td>Brands, customers, customers loyalty and distribution channels</td>
</tr>
<tr>
<td>Thomas Stewart (USA)</td>
<td>(1) Human capital</td>
<td>Employees are an organization’s most important assets</td>
</tr>
<tr>
<td></td>
<td>(2) Structural capital</td>
<td>Knowledge embedded in information technology, All patents, plans and trademarks</td>
</tr>
<tr>
<td></td>
<td>(3) Customer capital</td>
<td>Market information used to capture and retain customers</td>
</tr>
<tr>
<td>Göran Roos (UK)</td>
<td>(1) Human capital</td>
<td>Competence, attitude, and intellectual agility</td>
</tr>
<tr>
<td></td>
<td>(2) Organizational capital</td>
<td>All organizational, innovation, processes, intellectual property, and cultural assets</td>
</tr>
<tr>
<td></td>
<td>(3) Renewal and development capital</td>
<td>New patents and training efforts</td>
</tr>
<tr>
<td></td>
<td>(4) Relational capital</td>
<td>Relationship which include internal and external stakeholders</td>
</tr>
<tr>
<td>Nick Bontis (Canada)</td>
<td>(1) Human capital</td>
<td>The individual-level knowledge that each employee possesses</td>
</tr>
<tr>
<td></td>
<td>(2) Structural capital</td>
<td>Non-human assets or organizational capabilities used to meet market requirements</td>
</tr>
<tr>
<td></td>
<td>(3) Intellectual property</td>
<td>Unlike intellectual capital, intellectual property is a protected asset and has a legal definition</td>
</tr>
<tr>
<td></td>
<td>(4) Relational capital</td>
<td>Customer capital is only one feature of the knowledge embedded in organizational relationships</td>
</tr>
</tbody>
</table>

Note: Source: Bontis, William, & Richardson. (2000).

Human capital is the source of innovation (Bontis et al., 2000; Webster, 2000) and improvement; it generates innovation by new products and services or improving business process (Stewart, 1997). According to Edvinsson & Malone (1997), “It also includes the company’s values, culture, and philosophy. Human capital can not be owned by the company”. A higher level of human capital is generally connected with more innovative ideas, greater productivity and higher salary (Wilson & Larson, 2002). G. Roos and J. Roos (1997) argued that employees generate intellectual capital through their competence, their attitude and their intellectual agility. Competence is employees’ skills and education, while attitude covers the behavioral component of the employees’ work. Intellectual agility enables one to change practices and to think of innovative solutions to
problems (Bontis et al., 2000). Petty and Guthrie (2000) noted that human capital is the most valuable capital among the components of intellectual capital and money spends on human capital should not be viewed as cost but investment. According to resource based of the firm, human capital can be a sustained competitive advantage because it’s valuable, rare, inimitable and non-substitutable (Wright, McMahan, & McWilliams, 1994).

Structural capital is the knowledge that belongs to the firm as a whole in terms of inventions, technologies, publications, databases, culture and strategy, structures and systems, organizational procedures (Stewart, 1997). In other words, everything remains at the workplace at the end of the day, after the individuals within the company have left (Edvinsson & Malone, 1997; Grasenick & Low, 2004). Structural capital also includes intellectual property and infrastructural resources. Intellectual property is possessed by the firm and protected by law and is consist of trademarks, patents, copyrights. Infrastructural resources include organizational characteristics procedures and methods (Ricceri, 2008). There are six key components of structural capital that are: management philosophy, corporate culture, management processes, information technology systems, networking systems, financial relations (Brooking, 1996).

Customer capital is the company’s value of its franchise, its relationships with people with whom it does business, like market share, customer retention and defection rates, and per customer profitability (Stewart, 1997). Customer capital has also been referred to as relational capital. Relational capital describes a company’s relations with its external stakeholders and the perceptions that they hold regarding to the company (Bontis, 1998; Fletcher et al., 2003; Grasenick & Low, 2004). Customer capital is the easiest to measure, because revenues come from customers. For instance, Ford motor knows that an increase of one percentage in customer loyalty means a $100 million increase in profits (Stewart, 1997). It is not possible to improve the market value and organizational performance without considering customer capital (Chen, Zhu, & Xie, 2004).

In short, as can be seen in Table 1, Bontis et al. (2000) listed important elements of intellectual capital among authors.

Briefly, three components of intellectual capital assist to create value for companies by balancing the utilization and usage of the existing and unborn intellectual resources. This is an important issue for companies in the competitive environment.

**Innovation**

Recently increasing competition in global markets, and rapid changes in consumers’ needs and expectations are enforcing companies to enhance their performance in order to compete and survive (Jimenez & Sanz-Valle, 2005; Shipton, Fay, West, Patterson, & Birdi, 2005; Li, Zhao, & Liu, 2006; Beugelsdijk, 2008). Organizations must be creative and different in order to increase their performance and efficiently compete in the market.

According to Varis and Littunen (2010), innovations are improving the success and performance of the companies. Furthermore, it has been suggested that innovation is essential in order to generate long term stability, growth share holder returns, sustainable performance and remain at the leading edge of the organizations’ industry (Cottam, Ensor, & Band, 2001). Innovation is referred to very different kinds of “newness” regarding products, production methods and technologies, markets and organizational configurations (Vais & Littunen, 2010). Porter (1990) defined innovation as a new way of doing things that is commercialized, the newness being either technological or market related (Narvekar & Jain, 2006).
In the competitive world, innovation, which can be considered as an opportunity that provides competitive advantage depends on professionally implementations and successfully design of the company structure. In the literature, basic factors which affect the innovative behavior of companies are listed as: strategy, organizational design, management style, human resource management, organizational climate and culture (Jimenez and Sanz-Valle, 2005; Suliman, 2001).

On the other hand, companies should develop organization-specific innovation applications in order to accomplish high innovation performance. According to Peter Drucker (Lin & Chen, 2007), innovation, which is the core competence of the company, can be classified as radical and incremental innovation and also classified as technological and administrative innovation (Zhao, 2005). Besides, according to Oslo (2005), innovation is classified in four categories which are regarded as product, process, marketing and organizational innovation.

West (2002) defined innovation as a two-stage process which are creating idea and implementing the ideas processes. First stage covers developing knowledge, skills and behaviors and second stage refers to explorations related to determining new and different possibilities.

**Intellectual Capital & Innovation Integration**

Intellectual capital that provides structure, system, strategy and culture (Afuah, 2003) is an antecedent of innovation. Sufficient intellectual capital enables a firm to create innovations (Hermans & Kauren, 2005). Intellectual capital has a promoting effect on innovation performance of a company. Management of a company should improve the intellectual capital in order to enhance innovation performance (Narvekar & Jain, 2006).

Human capital is the source of innovation (Bontis et al., 2000; Webster, 2000) and improvement; it generates innovation by new products and services or improving business process (Stewart, 1997). Companies should recruit and manage employees who have higher degrees of intellectual capital in exchange for better innovation (Shipton et al., 2005). According to Charies (2004) innovation, knowledge management and intellectual capital are strongly correlated.

Authors made a literature review in national and international areas, and they encountered with only a few empirical studies about the direct relationship between the intellectual capital and innovation. These studies are briefly explained below:

In the longitudinal study of Subramaniam and Youndt (2005), they examined how aspects of intellectual capital which consists of human capital, organizational capital and social capital influenced various innovative capabilities (incremental and radical) in companies. In a longitudinal study of 93 companies in various industries, they found that human capital, organizational capital and social capital and their interrelationships selectively influence incremental and radical innovative capabilities. Organizational capital positively influenced incremental innovative capability, while human capital interacted with social capital and to positively influence radical innovative capability. Human capital itself was negatively associated with radical innovative capability. Social capital played a significant role in both types of innovation, as it positively influenced incremental and radical innovative capabilities.

Zerenler et al. (2008) made a research in the Turkish automotive supplier industry in order to investigate the influence of intellectual capital and its components—Employee capital, structural capital and customer capital—upon their innovation performance. 117 questionnaires were sent to managers of marketing department, R&D department and production department. The response rate of this study is high (78% or 92 respondents).
Main conclusion from this study is: Three components of intellectual capital which are human capital, structural capital and customer capital had significantly positive relationships with innovation performance.

In the study of Wu et al. (2008), they attempted to explore the mediating effect of intellectual capital on innovation. The research was made in Taiwanese manufacture and non-manufacture industries. Seven hundred survey questionnaires were mailed to firms. The response rate of the study is 22.71%. They found that effects of intellectual capital including human capital, customer capital and structural capital, on innovation exist at significant levels, suggesting a perfect mediating effect of intellectual capital on innovation.

Chen, Lee, Tung, and Kao (2008) aimed to explore the influences of innovative activities, intellectual capital towards corporate development in Taiwanese publicly listed IT corporations. During the study, from total of 800 questionnaires, 301 were returned. The response rate of the study is 36.63%. In the study, innovative activities have three sub categories which are Research & Development, managerial innovation and knowledge innovation. Intellectual capital involves human, structure and relationship capital. Corporate development has also three sub-categories as corporate value, corporate growth and corporate sustainability. They found that, there is a mutually positive correlation between innovative activities and intellectual capital. Accumulation of intellectual capital of Taiwanese IT corporations has positive influences on their operation and development. This suggests that the more the intellectual capital, the more added value contributed to corporations.

Ngah and Ibrahim (2009) used questionnaire to survey Malaysian small and medium enterprises in order to determine the relationship of intellectual capital, innovation and organizational performance. In the preliminary study, they found that human capital, contributes more to innovation and organizational performance than structural and relational capital.

**Conclusion**

Recently many scholars studied the subject “intellectual capital”, but there are only few studies about exploring the relationship of intellectual capital and innovation. This theoretical overview study gives brief insights to firms in defining their understanding of intellectual capital and innovation according to resource based view of firm. According to resource based view, intellectual capital is the core strategic asset which provides sustainable competitive advantage. After reviewing the theoretical and empirical studies about intellectual capital and innovation, it clearly shows that: Firms should improve their intellectual capital in order to enhance their innovation performance which leads to sustainable competitive advantage and superior performance.

**References**


