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Welcome to the seventh issue of *IJPPM* this year. We have eight thought-provoking and diverse papers in this issue ranging with studies in Ghana, Iran, India, the USA, Canada and Italy, using a broad variety of methods.

Famiyeh and Kwarteng provide insights into the implementation of environmental management practices (EMP) in Ghana. They used a survey questionnaire collected from 219 managers either in manufacturing or extracting industries. Employing factor analysis, the findings supported that regulative and mimetic institutional pressure have a significant influence on EMP whereas normative institutional pressure did not have a significant influence.

Salehi, Lari Dastkayaz and Mohammadi study the relationship between management characteristics and firm innovation in Tehran Stock Exchange-listed companies. Using data from 125 companies, descriptive-correlational design and panel data regression models were applied. They found that managerial entrenchment has a negative effect on innovation, whereas managerial ability could foster innovation; surprisingly neither agency cost nor overconfidence has a significant effect.

Adaku, Amaiko-Gyampah, Kwasi, Lomotey, Amoatey and Famiyeh provide another study in Ghana, this time with the Pension Trust Company. They used extensive data (old system: 14,400 claims and new system: 41,600 claims) in two types of programmes and compared them statistically. They found that the new system has reduced processing time by 20 per cent. This is quite an improvement.

Rai and Agarwal investigate the topic of workplace bullying and its influence on innovative work behaviour. Using data from 835 managerial employees in India, they found that workplace bullying is negatively related to workplace innovation and positively related to neglect. Based on their findings, they provide useful recommendations to managers.

Sticking with the workplace, Thomason, Brownlee, Beekman and Rustogi studied individuals’ attraction to different performance appraisal types using a five-factor model of personality types and applying a forced distribution ranking system (FDRS). They surveyed 148 students on graduate-level business courses in the USA. Their findings suggest that FDRS are attractive to those with high levels of psychological entitlement and low levels of conscientiousness, which contrasts with the existing research.

Ochieng presents a case study of financial performance in the non-profit context of US Triathlon. He shows that financial performance is related to both financial effectiveness and financial efficiency; this is particularly important in contexts where financial resources are unreliable.

Marchand and Raymond’s article studies performance measurement and management systems as IT artefacts using the Burton-Jones and Grange’s (2013) theoretical framework. Their work is applied to 16 SMEs in Canada and findings indicate that transparent interaction enables representational fidelity, which in turn enables informed action. This contributes to both the performance management and IS literatures.

Finally, our reflective practice article by Bianchi, Winch and Consenz presents work supporting entrepreneurial capabilities by incorporating individual attributes into organisation routines associated with lean dynamic performance management systems in small and micro enterprises in Italy. Their approach contrasts four organisation types: artisan, new company start-up, established firm and micro-giant company, and utilises system dynamics modelling.

As you can see, again another varied and interesting content to our seventh issue. We hope you enjoy!

Nicky E. Shaw and Luisa Delfa Huaccho Huatuco
Implementation of environmental management practices in the Ghanaian mining and manufacturing supply chains

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Abstract
Purpose – The purpose of this paper is to understand the driving forces of environmental management practices in mining and manufacturing firms using data from Ghana.
Design/methodology/approach – Prior exploratory factor analysis and structural equation modeling, based on questionnaire survey data, were used to study the driving forces of environmental management practices in the extractive and manufacturing firms using institutional theory.
Findings – Environmental management practices by organizations in Ghana are driven by regulatory and the mimetic pressures. Normative pressure has no significant effect on environmental management practices. The authors found no difference between the extractive and the manufacturing sectors as far as the results are concerned.
Research limitations/implications – The results indicate the importance of regulatory bodies in developing good environmental policies that are implemented and monitored in order to achieve improved environmental performance. Effective implementation of environmental policies is likely to motivate other firms to mimic the actions of implementing organizations. One limitation of this work is the use of data from Ghana. It is important for other researchers to assess these relationships using data from a wider geographical area.
Practical implications – The results indicate that organizations implement environmental management practices as a result of coercive and mimetic pressures. In practice, it is therefore important for the regulatory bodies, such as the Environmental Protection Agency Ghana, to be very innovative in developing good environmental regulations that are monitored to ensure implementation by all polluting sources. This is because the results indicate that the monitoring of regulations by regulatory bodies seems to be connected to the implementation of these regulations. Such implementation is also expected to be benchmarked by other firms, thereby influencing the “greening” agenda in Africa.
Originality/value – The study illustrates and provides some insights, and builds on the literature in the area of green supply chain strategies for a developing country’s environment. This is one of the few studies that investigate the driving forces of environmental management implementation using the institutional theory based on data from the African business environment.

Keywords Ghana, Productivity, Environmental, Coercive, Mimetic, Normative

Paper type Research paper

1. Introduction
Poorly regulated manufacturing and industrial activities have resulted in serious environmental problems such as global warming, ozone layer depletion, increasing waste and pollution levels all over the world (Shukla et al., 2009; King and Lenox, 2001). Despite the rapidly increasing research on companies’ environmental strategies and environmental management practices, the motivation for proactive implementation still remains unclear (Delmas and Toffel, 2004). It has been established that green practices have a positive impact on sustainability for all stakeholders (Balasubramanian and Shukla, 2017). Past researchers focusing on investigating why organizations have implemented environmental management practices have concluded these initiatives are either due to pressures from regulation and competition (Christmann, 2000; Dean and Brown, 1995; Delmas, 2003) or sometimes these pressures arise from non-governmental organizations (Lawrence and Morell, 1995). In this study, institutional theory is used as a framework to show that governments, regulators, workers, professional associations, customers and competitors impose coercive, normative
and mimetic pressures on organizations to implement environmental management initiatives (Carroll and Delacroix, 1982), using data from Ghana.

Apart from the numerous legal regulations that establish environmental practices such as the environmental assessment regulations, 1999, LI1652 (EPA Ghana, 1999); firms face pressures from different stakeholders regarding the implementation of environmental management practices, including downstream customers who prefer to buy eco-friendly products (Hu and Hsu, 2010; Shukla et al., 2009). The 1999 environmental assessment regulations 24 (1) set out by the Environmental Protection Agency (EPA) Ghana clearly state that all organizations operating in Ghana who have their preliminary environmental reports of environmental impact statement approved shall submit to the Agency an Environmental Management Plan (EMP) in respect of their operations within 18 months of beginning operations and thereafter every three years (EPA Ghana, 1999). The question is, apart from such formal command and control policies set up and monitored for implementation by firms in Ghana that drive the implementation of environmental management systems, what other forces drive the implementation of environmental management practices by firms in Ghana? The purpose of this study is to answer this pressing question using data from the Ghanaian business environment.

There have been some works related to environmental management such as Tuttle and Heap (2007), Prado-Lorenzo and García-Sánchez (2010), Björklund and Forslund (2013) and Wang and Sarkis (2013) on the integration of environmental and economic issues. Tuttle and Heap (2007) provided some evidence concerning the emerging consensus, on the importance to integrate environmental issues with economic and business issues to drive improvements in productivity and environmental impacts. Their results indicate this integration is very effective when environmental issues are planned as part of a total review of the life-cycle of products and their manufacturing and delivery processes. Prado-Lorenzo and Garcia-Sanchez (2010) investigated the effect of operation size, environmental conditions and management on municipal sewerage services using data from sewerage services in some municipalities in Spain. The results indicated that operation size and environmental conditions have a significant impact on efficiency, however, the management type, public or private, does not impact the degree of efficiency. A related work by Björklund and Forslund (2013) investigated the purposes of having environmental performance management systems (EPMS) in logistics management and how these performance measures can influence the focus of the supply chain using data from Swedish firms. They found target setting as the most common purpose of implementing EPMS into logistics management. Wang and Sarkis (2013), using data from the USA, investigated whether companies’ environmental and social supply chain activities impact on financial performance. In their findings, they indicated that integrated sustainable supply chain management, i.e., including social and environmental supply chain management efforts, is positively associated with corporate financial performance measured by return on assets and return on equity.

According to To and Tang (2014), the motivations and perceived benefits of the implementation of ISO 14001 by organizations were studied in Macao SAR and they identified the main factors driving the implementation of EMS were the promotion of environmental awareness among internal employees, regulatory compliance and the reduction of waste from operations. The above examples indicate some of the research work on the issue under investigation; however, most of the research findings are based on data from the developed world and that of Asia. This clearly indicates the need for research investigating the driving forces of environmental management practices in organizations from the developing economies especially, the Sub-Saharan Africa given the pressing environmental issues there.

The literature presents some research in the area of environmental management in Sub-Saharan Africa. These include environmental literacy by Owusu et al. (2017),
small-scale mining and environmental management by Aryee et al. (2003) and extent of stakeholder influence on environmental performance by Mensah (2014). Mensah (2014) examined the extent to which primary and secondary stakeholders influence the environmental performance of hotels in the Accra Metropolis of Ghana, and found that primary stakeholders such as customers and board of directors have significant influence on the environmental performance of hotels while size of hotel moderates the effect of stakeholders on the environmental performance of hotels. Our study is similar; however, different from that of Mensah (2014) in that the main theory underlying his work was stakeholder theory and his emphasis was specific to the hotel sector. The current study examines the drivers of environmental management implementation using institutional theory as well as data from more than one industrial sector. Industries in less developed economies face difficult challenges because of the lack of technology, human resources, expertise, strong institutions and competition. Thus, studies that contribute to the knowledge drivers of environmental management practices of organizations in such hostile environments should interest researchers. The contribution of this study to the literature is very important in that, we, first, examine the applicability of our proposed model of drivers of environmental management in a less developed Sub-Saharan African country. In addition, we contribute to fostering the development of a growing body of green supply chain management knowledge in developing countries.

The rest of the paper is structured into five main parts. First, we present the literature review and the research hypothesis, together with the conceptual model. This is followed by the research method and the data collection procedures. We then present the data analysis and the main findings. We finally present the discussion, conclusions, limitations and areas for future research in the last section.

2. Theoretical background and research hypotheses

2.1 Institutional theory

Institutional theory suggests that organizations are social systems, and is often used as a theoretical framework to explain why organizations adopt practices, policies and procedures (DiMaggio and Powell, 1983; Meyer and Rowan, 1977 cited in Scott, 2001). Institutional theory describes how organizations should behave (Hatch, 1997; Powell and DiMaggio, 1991; Scott, 1995) and the actions to be taken in response to environmental pressures (Grewal and Dharwadkar, 2002; Hoffman, 1997; Scott, 2001) that are beyond their control (Hoffman, 1977).

The theory suggests that an organization’s choices and actions are influenced by social behaviors, norms and values within the environment in which they operate (Selznick, 1957). This means that organizations are constrained by their environment and sometimes have to adopt and adhere to rules and practices created because of environmental pressure, which may not be the organization’s original intent. Meyer and Rowan (1977) stressed that to gain legitimacy and enhance their survival; organizations have to conform to institutional pressures within their operating environment. It is important therefore for organizations to respond to pressures from the environment, not only for the sake of resources and customers but also for political power and institutional legitimacy in order to achieve social, as well as economic, rewards (Carroll and Delacroix, 1982). Institutional isomorphism, according to DiMaggio and Powell (1983), occurs through three main mechanisms, namely, coercive pressure, normative pressure and mimetic pressures. We have therefore used these three mechanisms as our main constructs that underlie our investigation.

2.2 Literature review and the development of hypotheses

2.2.1 Coercive pressures and firm’s environmental management practices

Scott (1987) claimed that organizational behavior is influenced by two primary mechanisms: imposition
and inducement. The imposition mechanism is enacted through regulatory institutions while inducement mechanism works through other organizations that constrain the organization and direct its behavior (Oliver, 1991). Organizations, for instance, are forced to comply with laws enacted by regulatory institutions by making the necessary changes in their structure and processes in order to avoid the potential costs, uncertainty and legal liabilities for noncompliance (Clemens and Douglas, 2006; DiMaggio and Powell, 1983).

In the coercive view of institutional theory, the emphasis is placed on the conformity to lay down rules and rewards for good behavior as well as punishment for non-conformance (DiMaggio and Powell, 1983). Thus, coercive pressures may be considered as a force, a persuasion for firms to take certain actions which they did not intend to, due to pressures arising from government regulations or laws (DiMaggio and Powell, 1983); customers (Teo et al., 2003). Grewal and Dharwadkar (2002) claimed that firms are often forced into adopting practices or actions to avoid punishment; and sanctions (Scott, 1995).

One of the key stakeholders that influence the adoption of environmental management practices is governmental institutions. In Ghana, such government bodies in charge of environmental issues are the EPA; the ministry responsible for environment, science and technology; Minerals Commission; Forestry Commission; etc. These bodies are basically involved in regulating environmental issues by setting up the rules and regulations for and to monitor all polluting sources. These regulatory agencies are therefore responsible for promulgating and enforcing these regulations, a form of coercive power. Many countries, especially in Europe, have strict environmental regulations that prohibit hazardous products and promote recycling and products make-back (Tibben-Lembke, 2002; Ferguson and Browne, 2001).

Researchers have established the enforcement of legislation and regulations as a motivating factor for firms’ implementation of environmental practices (Carraro et al., 1996; Delmas, 2002; Majumdar and Marcus, 2001; Rugman and Verbeke, 1998). Delmas (2002) indicated one of the key players for companies to adopt ISO 14001, is the government. In a survey by Delmas in 2000 among European and US firms, a substantial number of managers indicated they adopt measures such as ISO 14001 in their operations in their quest to satisfy regulatory compliance. To and Tang (2014), in a study in Macao SAR, identified the top driving forces for the adoption of environmental management practices were the encouragement of environmental issues among workers, the effective management of operations in order to stay in compliance and reduction of waste in operations.

Heras-Saizarbitoria et al. (2011) conducted an extensive study of the driving forces and the benefits of implementing ISO 14001 by surveying 214 Spanish companies. They found that the most highly rated benefit was compliance with environmental laws and regulations, followed by environmental effectiveness improvement, less environmental problems and improving customer satisfaction. Williamson et al. (2006) used empirical research into the environmental practices of 31 manufacturing small- and medium-sized enterprises (SMEs) and found that “business performance” and “regulation” considerations drive the environmental behavior of the enterprises.

Jennings and Zandbergen (1995) were among the first researchers who applied the institutional theory to explain the adoption of environmental management practices in the organization, and indicated coercive forces, prescribed in the form of regulations and regulatory enforcement, have been the main driving forces of environmental management. Based on data from the wine industry in New Zealand, Dodds et al. (2013) found that the strong drivers for environmental sustainability initiatives are organizations concern about the state of the environment and social responsibility, followed by requirements for exporting and protection of agricultural land. Zailani et al. (2012) using data from 132 EMS-ISO-14001 – certified manufacturing firms in Malaysia, found a strong relationship between
environmental regulations and incentive as a driver of eco-design initiatives in organizations surveyed. These regulations and incentives also seem to drive environmental performance of the firms. In a study by Tate et al. (2011), concerning the driving forces of supplier adoption of environmental practices in the USA based on institutional theory analysis, they identified supplier adoption of environmental practices is more likely in the presence of coercive, normative and mimetic pressures. Cordano (1993) is of the view that the increasing levels of penalties, fines and legal costs have driven the importance for companies to comply with environmental regulations. Lampe et al. (1991) also indicate the need for firms to stay ahead of environmental regulations in order to avoid very expensive capital refits.

Building on regulatory or coercive pressure from institutional theory, the following hypothesis is proposed:

\[ H1. \] Regulatory or coercive institutional pressure will influence the implementation of environmental management practices by firms in Ghana.

2.2.2 Normative pressures and firm’s environmental management practices. Normative pressure refers to pressure that stems from professionalization, which has to do with the collective efforts by individuals of similar occupation to describe the ways and processes of their work and also establish a legitimate cognitive base for their occupational autonomy (Cheng and Yu, 2008; DiMaggio and Powell, 1983; Larson, 1991). A study conducted by Kollman and Prakash (2002) in two countries in Europe and the USA indicated why countries have different rates of EMS certification. They found out that the decision on whether to go for certification and the kind of standard, either ISO 14001 or EMAS, was basically influenced by the pressures from stakeholders in the various industry associations, in addition to regional chamber of commerce, suppliers and regulators. In a survey of 63 Brazilian companies from the chemical, mechanical and electronic industries, Gavronski et al. (2008) identified four sources driving the implementation of environmental management practices: reaction to pressures from the external stakeholders; proactive in expectation of future business concerns; legal concerns; and internal influences. Heide and John (1992) argued that when personnel within an organization aim to achieve the results of the same expectations, these expectations will become shared norms, which in turn influence organization attitudes toward the maintenance of relationship networks, and curtail behaviors that promote individual goals. Firms are pressured to conform to the shared norms and assure personnel in the field of its commitment to maintain procedural legitimacy (Zsidisin et al., 2005). In a survey of 209 manufacturers of Pearl River Delta in China, by Ye et al. (2013), the results indicated that institutional pressures including government pressure, customer pressure and competitor pressure have a statistically significant positive influence on top managers’ posture toward reverse logistics implementation. Using data from the hotel sector in Ghana, Mensah (2014) indicated that customers, as well as the board of directors, had a more significant influence on the environmental performance of hotels. However, this relationship seems to be moderated by the size of the hotel. Zailani et al. (2012), based on data from firms in Malaysia, indicated a strong relationship between customer pressures and design of ecologically friendly products.

Competitive pressures sometimes force firms to implement environmental programs (e.g. environmentally friendly programs, green products and environmental marketing programs) without studying the impacts it would have on the firm (Jennings and Zandbergen, 1995). Building on the normative pressure from the institutional theory perspectives, the following hypothesis is proposed:

\[ H2. \] Normative institutional pressure will influence the implementation of environmental management practices by firms in Ghana.
2.2.3 Mimetic pressures and firm’s environmental management practices. In addition to coercive and normative pressures, firms may also be under pressure to mimic practices that successful leading firms have adopted. Moreover, in an effort to establish quality management standards, firms are forced to respond to customer requirements and maintain customer–supplier relationships (Anderson et al., 1999). According to DiMaggio and Powell (1983), a mimetic process occurs when an organization models itself on other thriving organizations within an uncertain environment. Organizations tend to model themselves after other organizations they believe are well managed and able to survive in a competitive environment.

Corporate managers, for fear of regulations and customer dissatisfaction, are more likely not to take actions that are detrimental to the reputation of the company, especially when markets become more competitive, and the issue of customer satisfaction becomes relatively more important (Bansal and Clelland, 2004; Singhapakdi et al., 2001). This is normally very suitable when consumers place a premium on environmentally friendly products. In such situations, it is imperative for competing firms to mimic or benchmark themselves by implementing environmental or green management practices in order to stay in the competition. In developing a new theoretical proposition regarding how suppliers who are not early adopters are influenced to adopt environmental practices, Tate et al. (2011) concluded that supplier adoption of environmental practices is more likely if coercive, normative and mimetic institutional forces are in play. In a work focusing on the institutional perspective on the adoption of green information systems and technology, Chen et al. (2011) concluded that the mimetic and coercive pressures significantly drive green information system and technology adoption. They indicated, in particular, outcome-based imitation and imposition-based coercion represent major institutional processes. According to Chu et al. (2017), mimetic pressures drawn from the concept of institutional pressure have a positive significant impact on the performance of top managers, this impact tends to significantly affect the practices of green supply chain management and firm performance. Firms turn to follow the footsteps of successful competitors; this statement was found to be true by Yang (2016) who in his research found that firms mimic the environmental practices that successful leading firms have adopted in order to enhance their corporate image. Building on mimetic pressure from institutional theory, the following hypothesis is proposed:

\[ H3. \text{ Mimetic institutional pressure will influence the implementation of environmental management practices by firms in Ghana.} \]

Figure 1 summarizes the hypotheses of this study in a conceptual model. The hypothesized relationships between the constructs are all indicated as positive (+).

3. Material and methods

3.1 Data collection and sampling

In this study, we targeted the use of respondents involved in decision making at the top of the organization and also in decisions making related to the environment. These respondents are referred to as key informants because they normally report on relationships between their organizations and other organizations and are not reporting on their personal feelings or behavior (Van Weele and van Raaij, 2014). Miles and Arnold (1991) applaud the use of informants in the collection of research data, as they are of the view that informants such as top managers, managing directors, production managers were always willing and able to provide insight into their own underlying business orientations through a written self-administered survey instrument. These respondents were therefore responding on behalf of their organizations and not their personal emotions. A questionnaire made up of
previously validated measures for the different constructs was used as the means of data collection. The process of selecting a sample is an integral part of designing sound research. In theory, a sound sampling method will result in a sample that is free from bias and is reliable. Following from this and in line with the study objectives which is to understand the driving forces of environmental management practices in mining and manufacturing firms, a cluster sampling method was used. This sampling method was executed by first identifying theoretical or target population of interest, which in this case were the extractive and manufacturing firms in Ghana. These groupings were selected because they constitute the institutions whose activities will have the greatest impact on the environment in the case of Ghana. An accessible population or sampling frame was identified from the two groupings based on the firms which have implemented EPA standards in recent past. From this, the researchers selected the individual subjects based on simple random sampling. Table I provides details of the various firms and their representation in the actual sample. The firms in the sample span across diverse industry structure and ownership, i.e., state-owned firms, private firms and multinationals.

The survey questionnaires were distributed using graduate and undergraduate students, pursuing different management programs in a university in Ghana, as research assistants. To avoid duplication of samples in this study, each assistant was assigned to a particular geographic area to conduct his/her survey. These students were also responsible for collecting the completed surveys and sending them back to the researchers within a month. The collection of the data took place over a nine-month period. In all, 350 questionnaires were sent out to respondents; however, only 242 were returned resulting in a response rate of 69.1 percent. The data analysis is, however, based on 219 completed responses, representing a usable rate of 62.5 percent. The researchers grouped respondents in two main sectors, the extractive and manufacturing. There were 30 respondents from the extractive sector, representing 13.7 percent, while the rest 189, representing 86.3 percent, came from the manufacturing sector. The manufacturing sector consisted of respondents from food processing (14.2 percent), rubber products (11 percent), chemicals (10.0 percent), water processing (9.1 percent), etc. (see Table I for the details of the various manufacturing sectors). In fact, very top-level managers responded to the survey. In total, 79 of the usable responses representing 36.1 percent were production managers, 63 representing 28.8 percent were health, safety and environmental managers and 59 representing 26.6 percent were managing directors. Only 18 respondents representing 8.2 percent did not
indicate their positions. In terms of the experience of the respondents, 121 out of the 219 representing 55.3 percent have worked with their organizations for more than five years and 77 representing 35.2 percent have between two to five years working experience with their organizations. Only 21 of the respondents had less than two years experience. Detailed descriptive statistics of the sectors and respondents that responded to the survey have been presented in Table I.

### Measures

In this study the measures used to evaluate the institutional pressures in the Ghanaian manufacturing and mining sector were those recommended by DiMaggio and Powell (1983), Liang *et al.* (2007), Teo *et al.* (2003), Grewal and Dharwadkar (2002) and Scott (1995). To measure coercive or regulative pressure, we considered issues such as requirements on environmental management by the EPA of Ghana and the Ministry of Lands and Natural Resources (MLNR), the requirements from industry associations on environment, and how
the competitive environment requires organizations to initiate environmental management practices in order to be competitive as recommended by DiMaggio and Powell (1983), Liang et al. (2007) and Teo et al. (2003).

Specifically, regulative pressures were measured using questions like our company adopts environmental management practices for the reasons that: please indicate (1 = strongly disagree; 5 = strongly agree):

1. the EPA of Ghana requires our firm to plan and implement environmental management practices (REG1);
2. the industry associations in Ghana requires our firm to plan and implement environmental management practices (REG2);
3. the MLNR requires our firm to plan and implement environmental management practices (REG3);
4. the competitive conditions of our firm require our firm to plan and implement environmental management practices (REG4); and
5. the international environmental regulation requires that our firm plan and implement environmental management practices (REG5).

To measure the normative pressure, we considered issues like the extent of environmental management practices adopted by suppliers, customers and the extent to which government promotion of environmental management practices influences the adoption of environmental management practices. This scale is largely consistent with the dimensions recommended by Teo et al. (2003) and Liang et al. (2007).

Specifically, normative pressures were measured using questions like: our company adopts environmental management practices due to: please indicate (1 = strongly disagree; 5 = strongly agree):

1. the extent of environmental management practices adopted by suppliers (NORM1);
2. the extent of environmental management practices adopted by customers (NORM2);
3. the extent to which the government of Ghana promotes environmental management practices (NORM3); and
4. the extent to which the global community promotes environmental management practices (NORM4).

Following Teo et al. (2003), the mimetic pressure construct was measured in terms of the perceived extent to which competitors have benefited from the implementation of environmental management practices. This construct was measured by asking respondents to assess themselves based on how they think competitors in the industry have benefited from the adoption of environmental management practices. Respondents were also to assess how their competitors are perceived as favorites in the same industry by suppliers and customers due to their adoption of environmental management practices (Liang et al., 2007; Teo et al., 2003).

Specifically, mimetic pressures were measured using questions like: our competitors who planned and implemented comprehensive environmental management practices; please indicate (1 = strongly disagree; 5 = strongly agree):

1. have benefited (MIME1);
2. are favorably perceived by others in the same industry (MIME2);
3. are favorable perceived by their suppliers in the same industry (MIME3); and
4. are favorably perceived by their customers in the same industry (MIME4).

Environmental management practices were measured according to Zhu et al. (2008). This was with reference to senior- and middle-level managers’ commitment to environmental
management practices, cross-functional cooperation for environmental improvements, environmental compliance and auditing programs and ISO 14001 certification or environmental permit from the EPA Ghana. Specifically, environmental management practices were measured using questions like: please indicate (1 = strongly disagree; 5 = strongly agree):

1. our senior managers are committed to environmental management (EMP1);
2. our middle-level managers are committed to environmental management (EMP2);
3. our organization has a cross-functional cooperation for environmental improvements (EMP3);
4. our organization is committed to environmental compliance and auditing programs (EMP4);
5. our organization has ISO 14001 Certification (EMP5); and
6. our organization has EPA Ghana Certification (EMP6).

3.3 Analytical techniques
The relationships between the hypothesized model, namely, institutional pillars; regulative, normative, mimetic constructs and the environmental management practices were examined through the use of structural equation modeling (SEM). These were tested using AMOS software version 23. In this study, we conducted an exploratory factor analysis (EFA) on the items using the SPSS software. The factor analysis indicated how distinct (discriminant validity) the constructs are and that each measures a single thing (convergent validity), and that they are reliable (reliability). This can all be achieved in the confirmatory factor analysis (CFA). Where the pre-validated instrument used is being applied to a different data set or within a different context or environment, EFA could be repeated before performing the CFA (Gaskin, 2016). Thus, it was decided to conduct an EFA prior to the testing of our structural model since the items were adapted and going to be used in a different environment (Osborne and Fitzpatrick, 2012; Gaskin, 2016). An EFA with the maximum likelihood extraction method and the Promax with Kaiser normalization was used in the study. The rotation converged with five iterations. The objective of this was to extract the latent factors of the institutional theory and environmental management practices (Sadikoglu and Zehir, 2010; Gunday et al., 2011). All the items under the respective constructs were reflective in nature and for that reason; they were all modeled as such. Apart from that AMOS application does not lend itself easily to formative constructs and for that, the default model was used (Gaskin, 2016). A CFA was therefore performed on all the items and constructs based on their reliabilities and validities by evaluating the Cronbach’s \( \alpha \) coefficients, outer loadings, average variance extracted (AVE), and composite reliabilities (CR) (Sadikoglu and Zehir, 2010).

4. Results
4.1 Exploratory factor analysis
In this study, we started with 4 constructs and 21 items. After five iterations, the results of the EFA analysis converged with same four constructs, however, 5 out of the 21 items were deleted due to poor loadings. The final model, therefore, consisted of 4 constructs and 16 items, three for institutional pillars and one for environmental management practices. The extracted institutional theory constructs were labeled as regulatory, normative and mimetic pressures. Similarly, four items loaded to a coherent factor and was labeled environmental management practices accordingly. The pattern matrix for the EFA is presented in Table II.
The Kaiser–Meyer–Olkin (KMO) measure of the sampling adequacy was found to be 0.883, which was greater than 0.5 indicating that the sample size is adequate for the given number of variables used for the factor analysis (Hutcheson and Sofroniou, 1999). Table III presents the KMO and Bartlett’s test of sphericity values. Table IV presents the descriptive statistics of the constructs used in the study.

4.1.1 Summary of EFA. The results of the EFA indicate: factor 1 as a regulative, factor 2 as a normative, factor 3 as a mimetic and factor 4 as environmental management practices.

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<th>1</th>
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<th>3</th>
<th>4</th>
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<tbody>
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<td></td>
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<tr>
<td>REG1</td>
<td>0.800</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>REG2</td>
<td>0.942</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>REG3</td>
<td>0.980</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>REG4</td>
<td>0.810</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MIME1</td>
<td></td>
<td>0.921</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MIME2</td>
<td></td>
<td>0.801</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MIME3</td>
<td></td>
<td>0.893</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MIME4</td>
<td></td>
<td>0.779</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eigenvalues</td>
<td>6.559</td>
<td>2.825</td>
<td>2.005</td>
<td>1.539</td>
</tr>
<tr>
<td>% variance extracted</td>
<td>38.638</td>
<td>16.169</td>
<td>10.932</td>
<td>8.818</td>
</tr>
</tbody>
</table>

**Notes:** Extraction method: maximum likelihood; rotation method: promax with Kaiser normalization; rotation converged in five iterations

Table II. EFA pattern matrix

<table>
<thead>
<tr>
<th>Items</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>NORMATIVE</td>
<td>219</td>
<td>1</td>
<td>5</td>
<td>2.259</td>
</tr>
<tr>
<td>ENVMT</td>
<td>219</td>
<td>1</td>
<td>5</td>
<td>3.817</td>
</tr>
<tr>
<td>REGULATIVE</td>
<td>219</td>
<td>1</td>
<td>5</td>
<td>4.000</td>
</tr>
<tr>
<td>MIMETIC</td>
<td>219</td>
<td>1</td>
<td>5</td>
<td>3.530</td>
</tr>
</tbody>
</table>

Table IV. Descriptive statistics of constructs
4.2 Confirmatory factor analysis

The factor structure was tested and scales validated by conducting a CFA (Hair et al., 2010). The model consisted of 4 constructs with 16 indicator elements, see Figure 2. All the constructs in the model consisted of four items each. Figure 2 presents the constructs and their items which were the basis for the CFA. Prior to the assessment of the structural relationships between the constructs, we assessed the quality and the fitness of the measurement models as recommended when using CB–SEM. The study, therefore, examined the reliability of the items used, convergent and discriminant validity as well as the general goodness of fit of the model. To conduct this quality and goodness of fit analysis, we used the “Master Validity Tool,” an AMOS Plugin tool developed by Gaskin and Lim (2016a).

To establish convergent validity, we considered the outer loadings as well as the AVE for items and constructs, respectively. All items had very high loadings on their respective constructs, ranging between 0.7 and 0.9, indicating very high convergent validity, all above 0.7 (Fornell and Larcker, 1981). Table IV, therefore, indicates that the AVE’s for all constructs were ranging between 0.673 and 0.795, larger than the recommended threshold value of 0.5 (Fornell and Larcker, 1981; Hu and Bentler, 1999). For discriminant validity,
the study adopts Fornell–Larcker’s criterion, which compares the square root of the AVE values with latent variable correlations (Fornell and Larcker, 1981). Specifically, the square root of each construct AVE should exceed the correlations with other constructs. The analysis established that the square root of all constructs AVEs was greater than the correlations with other constructs (Chin, 1998; Fornell and Larcker, 1981; Hu and Bentler, 1999), as shown in Table V, exhibiting discriminant validity. The research also ensured the constructs had high internal consistency by calculating their CR values. The CR values were also ranging between 0.891 and 0.939, all above the recommended level of 0.7 (Nunnally and Bernstein, 1994), as displayed in Table IV. In addition, all the Cronbach’s α values were above 0.7 which can be considered as within the recommended statistical limit or threshold, according to Hair et al. (2014) and Hu and Bentler (1999). At this stage, the four constructs used in the model were considered satisfactory in terms of convergent, discriminant and CR, and can, therefore, proceed to the overall goodness of fit of the CFA.

The overall goodness of fit assessment results of the initial CFA was actually good, but the results recommended some modification indices between e15 and e16. At this stage, the recommended modification indices were applied to the items loading on the same constructs with higher error terms as recommended. This procedure improved the overall goodness of fit on the modified model. The final CFA model had a $\chi^2$ of 205.098 with df of 98. The CMIN/df was 2.093. The comparative fit index (CFI) was 0.978, SRMR was 0.037, RMSEA was 0.054 and PClose was 0.267. The overall model fits for the measurement model were therefore within recommended ranges according to Hu and Bentler (1999), Byrne (2010) and Hair et al. (2010). Table VI presents the results of the model fit for the CFA using the “Model Fit Measures,” an AMOS Plugin tool developed by Gaskin and Lim (2016a). At this stage, all the constructs used in the model were considered as satisfactory in terms of convergent validity, discriminant validity, CR and model fit, and can, therefore, proceed with the relationships hypothesized in the structural model.

4.3 The structural model
To proceed with the hypothesized relationships predicted in the structural model, we finally assessed the model fit of the default structural model. The default structural model $\chi^2$ was 161.866 with df of 97. The CMIN/df was 1.669. The CFI was 0.987, SRMR was 0.041, RMSEA was 0.042 and PClose was 0.876. The overall model fit for the structural model was therefore

<table>
<thead>
<tr>
<th>Constructs</th>
<th>CR</th>
<th>AVE</th>
<th>CA</th>
<th>Regulative</th>
<th>Normative</th>
<th>Mimetic</th>
<th>Envmgt</th>
</tr>
</thead>
<tbody>
<tr>
<td>REGULATIVE</td>
<td>0.939</td>
<td>0.795</td>
<td>0.953</td>
<td>0.891</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NORMATIVE</td>
<td>0.927</td>
<td>0.760</td>
<td>0.930</td>
<td>0.233</td>
<td>0.872</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MIMETIC</td>
<td>0.914</td>
<td>0.726</td>
<td>0.921</td>
<td>0.475</td>
<td>0.231</td>
<td>0.852</td>
<td></td>
</tr>
<tr>
<td>ENVMGT</td>
<td>0.891</td>
<td>0.673</td>
<td>0.920</td>
<td>0.530</td>
<td>0.224</td>
<td>0.368</td>
<td>0.820</td>
</tr>
</tbody>
</table>

Table V. Validity and reliability measures

<table>
<thead>
<tr>
<th>Measure</th>
<th>Estimate</th>
<th>Threshold</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMIN</td>
<td>205.098</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>df</td>
<td>98</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>CMIN/df</td>
<td>2.093</td>
<td>Between 1 and 3</td>
<td>Excellent</td>
</tr>
<tr>
<td>CFI</td>
<td>0.978</td>
<td>&gt; 0.950</td>
<td>Excellent</td>
</tr>
<tr>
<td>SRMR</td>
<td>0.037</td>
<td>&lt; 0.080</td>
<td>Excellent</td>
</tr>
<tr>
<td>RMSEA</td>
<td>0.054</td>
<td>&lt; 0.060</td>
<td>Excellent</td>
</tr>
<tr>
<td>PClose</td>
<td>0.267</td>
<td>&gt; 0.050</td>
<td>Excellent</td>
</tr>
</tbody>
</table>

Table VI. Goodness of fit (GoF) measures for the CFA model
within the recommended ranges according to Hu and Bentler (1999), Byrne (2010), Hair et al. (2010). Table VII presents the results of the model fit for the default structural model using the “Model Fit Measures,” an AMOS Plugin tool developed by Gaskin and Lim (2016b). At this stage, we can confirm that the default model satisfies all the recommended quality criteria and now suitable to assess the relationships hypothesized in the structural model. The default model is presented in Figure 3.

4.4 The hypothesized relationships
After meeting all the prescribed quality criteria for the measurement as well as the default models the last step in the CB–SEM is to analyze the structural model. These results are presented in Table VIII. The table presents the effect of the three exogenous constructs, the institutional pillars on the single endogenous construct, environmental management practices. This estimate represents the β value (coefficient value associated with environmental management practices). This value assesses the relationship between a given exogenous variable and it respective endogenous variables holding all other exogenous

<table>
<thead>
<tr>
<th>Measure</th>
<th>Estimate</th>
<th>Threshold</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMIN</td>
<td>161.866</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>df</td>
<td>97</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>CMIN/df</td>
<td>1.669</td>
<td>Between 1 and 3</td>
<td>Excellent</td>
</tr>
<tr>
<td>CFI</td>
<td>0.987</td>
<td>&gt; 0.950</td>
<td>Excellent</td>
</tr>
<tr>
<td>SRMR</td>
<td>0.041</td>
<td>&lt; 0.080</td>
<td>Excellent</td>
</tr>
<tr>
<td>RMSEA</td>
<td>0.042</td>
<td>&lt; 0.060</td>
<td>Excellent</td>
</tr>
<tr>
<td>PClose</td>
<td>0.876</td>
<td>&gt; 0.050</td>
<td>Excellent</td>
</tr>
</tbody>
</table>

Table VII. Goodness of fit measures (Gof) for the default model

Figure 3. The default model showing the constructs and their hypothesized relationships
variables constants. The fourth column labeled, standard error presents the standard deviation associated with the $\beta$ value in the third column. The fifth column labeled critical value (CR) defines the critical value (z-value) associated with the $\beta$ value. These values enable us to identify the significance of the $\beta$ value. The last column which is labeled the $p$-value presents the significance of the relationship under consideration at a given confidence interval which in this study is 95 percent (Draper and Smith, 2014).

Figure 3 and Table VIII show the model tested and the path coefficients as well as $R^2$ for the endogenous construct. This $R^2$ value indicates the portion of the variance of the endogenous variables which is explained by the structural model. According to Cohen (1988), an $R^2 = 2$ percent is classified as having a small effect, $R^2 = 13$ percent is classified as having a medium effect and $R^2 = 26$ percent can be classified as having a large effect. Thus, the results in Figure 3 indicate that the model explained 31 percent of the variance in environmental management practices indicating a large effect. On the relationships, the results indicate that the regulatory pillar of institutional theory has a significant impact on the planning and implementation of environmental management practices ($\beta = 0.440$, $p = 0.000$), providing support for $H1$. The results further indicated that the normative pillar of institutional theory has no significant impact on the planning and implementation of environmental management practices ($\beta = 0.090$, $p = 0.074$), rejecting $H2$ at 5 percent significance level. The results indicated that the mimetic pillar of institutional theory has a significant impact on the planning and implementation of environmental management practices ($\beta = 0.140$, $p = 0.016$), also providing support for $H3$.

### 4.5 Multi-grouping analysis

The work investigated the model further to assess as to whether the results will differ significantly between the various industrial sectors. The objective was to check as to whether the results are moderated by the various industrial sectors surveyed. Moderation analysis in SEM is a suitable and applicable methodology for comparing research model beyond two groups. Taking the various industrial sectors into account will help explain the driving forces of environmental management practices implementation and provides a more accurate context for the variables (Tix and Frazier, 1998). To test for the presence of moderation in our results, we performed a multi-grouping analysis whereby the data were split into two based on the two main industrial sectors: extractive and manufacturing. The use of multi-group comparisons was to test if the relationships hypothesized in the model will differ from the value of the moderator (i.e. the two key sectors) (Floh and Treiblmaier, 2006; Byrne and Stewart, 2006). We, therefore, performed the $\chi^2$ difference test for the industries on the model level which resulted in no significant difference between the extractive and manufacturing sectors surveyed. Based on the results of the model level, we further decided to test the individual path in the model to determine where the differences exist. We freely estimated the models except constraining one path to be equal across groups (see Figure 4) and the results were that the $\chi^2$ difference test indicated no significant effect on the different industrial sectors surveyed (see Table IX for the multi-groupings results).

<table>
<thead>
<tr>
<th>Endogenous</th>
<th>Exogenous</th>
<th>Standardized regression estimate</th>
<th>Unstandardized regression estimate</th>
<th>SE</th>
<th>CR</th>
<th>$p$-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENVMT</td>
<td>MIMETIC</td>
<td>0.140</td>
<td>0.104</td>
<td>0.043</td>
<td>2.416</td>
<td>0.016</td>
</tr>
<tr>
<td>ENVMT</td>
<td>NORMATIVE</td>
<td>0.090</td>
<td>0.068</td>
<td>0.038</td>
<td>1.787</td>
<td>0.074</td>
</tr>
<tr>
<td>ENVMT</td>
<td>REGULATIVE</td>
<td>0.440</td>
<td>0.459</td>
<td>0.060</td>
<td>7.668</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Table VIII. Results of the hypothesized relationship in the default model
5. Discussion and conclusions

In this study, we have provided some empirical evidence on the driving forces of environmental management practices into organizations using institutional theory. The results from our study highlight the relationship between the three institutional pillars, i.e., regulative, normative, and mimetic in the planning and implementation of environmental management practices in Ghanaian firms. The findings indicate that firms in Ghana incorporate environmental management practices into their operations due to forces exerted from the regulatory bodies as well as benchmarking initiatives of other organizations in the same industry which have successfully planned and implemented environmental management practices into their operations. These findings corroborate those of Delmas (2002), Tate et al. (2011), Williamson et al. (2006), To and Tang (2014) and Heras-Saizarbitoria et al. (2011). In a survey by Delmas (2001) among European and US firms, a substantial number of managers indicated they adopt measures such as ISO 14001 environmental management systems in their operations in the quest to satisfy regulatory compliance. Heras-Saizarbitoria et al. (2011) also conducted an extensive literature review concerning the

<table>
<thead>
<tr>
<th>Path</th>
<th>df</th>
<th>CMIN</th>
<th>p-values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unconstrained model</td>
<td>15</td>
<td>9.011</td>
<td>0.877</td>
</tr>
<tr>
<td>Regulative – Envt Mgt Pract</td>
<td>1</td>
<td>1.034</td>
<td>0.309</td>
</tr>
<tr>
<td>Normative – Envt Mgt Pract</td>
<td>1</td>
<td>0.094</td>
<td>0.759</td>
</tr>
<tr>
<td>Mimetic – Envt Mgt Pract</td>
<td>1</td>
<td>2.556</td>
<td>0.110</td>
</tr>
</tbody>
</table>

Table IX. Multi-groupings results
motivations for and benefits of implementing ISO 14001 environmental management systems and surveyed 214 Spanish companies. They found that the most highly rated benefit was compliance with environmental laws and regulations, followed by environmental effectiveness improvement, less environmental problems and improving customer satisfaction. Williamson et al. (2006) used empirical research into the environmental practices of 31 manufacturing SMEs and found that “business performance” and “regulation” considerations drive the environmental behavior of the enterprises. Also, in a study to understand the transaction cost and institutional drivers of supplier adoption of environmental practices in the USA, Tate et al. (2011) found that institutional theory analysis reveals that supplier adoption of environmental practices is more likely if coercive, normative and mimetic institutional forces are in play.

In addition to coercive pressures, the results also indicated that organizations in Ghana mimic practices that successful leading firms have adopted in terms of environmental management practices. This finding is consistent with that of Anderson et al. (1999), Henriques and Sadorsky (1996) and Khanna and Anton (2002). Our results also confirm those of DiMaggio and Powell (1983) and Jennings and Zandbergen (1995). DiMaggio and Powell (1983) posit that a mimetic process occurs when an organization models itself on other organizations in an uncertain environment. Organizations tend to model themselves after other organizations they believe are well managed and able to survive in a competitive environment. According to Jennings and Zandbergen (1995), firms sometimes implement programs (e.g. environmentally friendly programs, green products and environmental marketing programs) without studying the impacts, but rather due to competitive pressure.

The results, however, contradict with the findings of Kollman and Prakash (2002) who examined why the UK, Germany and US companies adopt an EMS. They found in the USA that the decision of whether to pursue certification and which standard to certify against (ISO 14001 or the European Union’s Eco-Audit and Management Scheme) was strongly influenced by stakeholder pressures from industry associations in addition to regional chambers of commerce, suppliers and regulators.

Our results indicate consistency across the various industrial, i.e., manufacturing and the extractive sectors surveyed based on the multi-grouping analysis. This is might be due to the fact that both the manufacturing and the extractive sectors are highly regulated by the EPA Ghana based on Act, 203, 1994 and the L.I 1652, 1999. Over the years, the Ghanaian business environment has been regulated by the Environmental Protection Council (EPC). The main objective then was to advise the government on environmental issues. However, since 2004, the EPC was converted to the EPA, operating as a public agency that can sue and be sued, thereby strengthening environmental regulations in the country.

6. Implications, limitations and future research
The results indicate that organizations implement environmental management practices as a result of coercive and mimetic pressures. The implication is that it is important for regulatory bodies such as the EPA Ghana to actually develop effective and efficient environmental policies that are implemented and monitored in order to achieve improved environmental performance. This is because the finding has indicated that one of the main driving forces of environmental management practices implementation is the regulatory pillar. It is important therefore for the EPA Ghana to plan and guide the effective implementation of policies as well as monitoring on all sectors including manufacturing and the extractive sectors. Another implication from the findings of this work is that there is the need for regulatory bodies to continually monitor polluting firms to make sure they are planning and implementing policies related to the environment since the effective implementation of these policies will motivate other firms to mimic the actions of the implementing firms. The results also indicate the importance of educating industrial associations on the importance of
integrating environmental issues into manufacturing and service delivery to enable them to play an active role in achieving sustainable development.

One limitation of this work is the use of data only from Ghana. It is important for other researchers to assess these relationships using data from other geographical areas. In an attempt to operationalize the environmental management practices construct, the research developed and used only one construct based on previously validated items. The inclusion of other constructs could be interesting for future research. This could provide valuable knowledge about the link between these institutional pillars and other categories of environmental management practices to obtain a more in-depth view of the relationship. Future studies can also consider the relationship between the three institutional pillars and corporate social responsibility initiatives.

References


Further reading


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The relationship between management characteristics and firm innovation

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Department of Economics and Administrative Sciences, Qaenat Branch, Islamic Azad University, Gaenat, Iran

Abstract

Purpose – The purpose of this paper is to assess the relationship between some management features (management capability, management entrenchment, agency costs and overconfidence) and the innovation of companies listed on the Tehran Stock Exchange.

Design/methodology/approach – The study carried out during 2009–2015. A total of 125 companies were selected from eight industries as the sample of study using the method of systematic elimination. A descriptive-correlational design was used in this study and panel data regression models were employed for developing the relationship between research variables.

Findings – The obtained results indicated that managerial ability could foster innovation, while managerial entrenchment could stifle innovation and agency costs and overconfidence have no effect on innovation.

Originality/value – The current study is almost the first project which focuses on the management characteristics and firm innovation in developing countries.

Keywords Innovation, Overconfidence, Agency costs, Managerial entrenchment, Managerial capability

Paper type Research paper

1. Introduction

The development of market economy along with the international economy has intensified the competition among business enterprises, accelerated product update processes and broadened the scope of research and development activities, more than ever, to survive and develop the business enterprises. Research and development is vital for manufacturing new products, possessing new markets and consequently increasing a firm profitability (Yang-hai, 2010).

Many scholars were concerned about the relationship between the board of directors and a firm performance and agency theory is one of the most significant issues in this field. According to this theory, supervision of managerial activities is the most important duty of the board to preserve the interests of shareholders and it is expected that such surveillance improves the performance of the desired firm. From agency theory point of view, the significance of corporate governance is implicit in the conflict of interests between managers and shareholders. In other words, corporate governance is working as a mechanism, which aligned the objectives of managers with that of the shareholders and caused corporate performance improvement (Fooladi and Zaleha, 2012). The global competition, which is launched basically as of the 1980s has led the companies to concentrate on business strategies, especially innovation. Innovation is defined as the development of a novel method with the aim of creating freshness in the economy. Innovation can be regarded as a tool for converting knowledge to a business value (Gandhi et al., 2011; Zehir et al., 2015). Innovation is the main prerequisite for competition in the twenty-first century. Growing competition, extreme environmental agitations, technological alterations, and environmental uncertainties have made the organizations promote innovation as a leading section of their strategies.
Jimenez-Jimenez et al., 2008. Abdulai Mahmoud and Hinson (2012) categorized the innovation into three general classes of innovation in product, innovation in process and innovation in management. To measure the innovation, companies often spend from the funds of research and developments (Chakraborty et al., 2014). Although a research and development fund is among investment decisions taken by the companies, such costs have a peculiar characteristic, which make them significantly different from other investment decisions. In contrast to tangible investments, such as capital expenditure, the implicit data in research and development costs not only comprise the tangible ones, but reflect intangible information concerning future cash flows (Chen et al., 2014)

On the other hand, it is proven that innovation, as one of the most important components of competitiveness, could improve the performance of companies. In fact, the reason why companies use the innovation is to achieve better business performance and to increase the competitiveness (Gunday et al., 2011). Based on different reasons (such as, a need for manufacturing new product, use of organizational methods and the creation of a character, better market performance and better understanding the customers), we could substantiate that innovation is one of the basic strategies of each company, in that innovation today is an essential tool for entering new markets, increasing the existing market share and enhancing competitive advantages. Such a great concentration on innovation is the result of more competitiveness in national and international markets. These facts indicate that innovation is an essential component of organizational strategies (Karlsson and Tavassoli, 2016). When the innovation flow is no longer operational in a company, the economic structure will be abandoned in a passive situation and its growth will be limited. Therefore, innovation plays a significant role in creating a difference between the performance of various companies and even countries. Companies that develop innovations frequently and quickly enjoy from a high-quality staff, pay more and provide special future plans for them. Hence, the impact of innovation on performance comprises a variety of aspects from sales and market share to profitability and efficiency (Gandhi et al., 2011). Innovation enables the company to create value for itself and to preserve its competitive advantages in today’s chaotic and complex situation. In general, innovation not only causes the company to utilize the current resources appropriately and improve its value and efficiency, but brings some intangible assets to the company. Companies with higher innovations are more successful in responding customers’ needs and are more capable of achieving the leading performance and more profitability. Innovation is vital for implementing operational efficiency and increasing the quality of services (Wang and Wang, 2012). The experimental evidences revealed that the board characteristics, including size and independence, in addition to performance, could affect the innovative activities, as well (Chouaibi et al., 2010; Zhao and Wen, 2011). Studies on innovation have been on two main topics, so far. Some were concerned about the effect of innovation on market value (i.e. Connolly and Hirschey, 2005; Bae and Kim, 2003) and some were on the realization of effective factors, such as cash flow, corporate size, industry classification, etc., on innovation (Cumming and Macintosh, 2000). The focus of the present study is on the latter, such that, the effect of some other factors of board characteristics (such as, entrenched, agency costs, competency and overconfidence) on innovation is assessed companies listed on the Tehran Stock Exchange. Thus, the research question is proposed as follows:

*RQ1. To some extent do the board characteristics could affect the innovation of companies listed on the Tehran Stock Exchange?*

**2. Theoretical issues, related literature and hypotheses development**

*2.1 The relationship between management competency and firm innovation*

The significance of innovation as one of the most important determining factors of organizational performance is approved (Sun, 2015). More specifically, innovative activities
are conducted in order to reach market objectives and production, including improving product quality, controlling production costs, increasing market share, accessing new markets, production flexibility, etc (Anderson et al., 2014; Bigliardi and Galati, 2016). Innovation could motivate the company to achieve high competitive standards and hold the position. Since innovative activities could strengthen both executive and technological innovations of a company, they could fuel growth and profitability (Nicolau and Santa-Maria, 2013).

In Van de Ven points of view, four problems contribute to innovation management:

1. Human problem: people in companies are more concentrated on their daily routines and this could bring about less attention to development and production of new ideas. The question rises here is that whether the leadership intervention could center the attention of organization members to innovative activities instead of daily routines or not (Nicolau and Santa-Maria, 2013).

2. Process problem: although the concept of new ideas may be considered as an individual activity, it should be noted that implementing new ideas ask for a collective effort to reach a broader and better admissibility (Nicolau and Santa-Maria, 2013).

3. Structure problem: ideas may derive from different sections of a company. Thus, various resources and missions should be undertaken to implement an innovative idea. So, the question here is that how we could gather such “components” together to achieve a “complete one” (Nicolau and Santa-Maria, 2013).

4. Strategic problem: there is a consensus about the effect of organizational leadership on innovation, especially when the company should adopt an alternative method to deal with current affairs (Nicolau and Santa-Maria, 2013).

According to Kelley et al. (2011), companies use the performance-based evaluation in selecting their project managers and those would be appointed, who first, are experienced enough and second are well equipped with the required skills for innovation. Vaccaro et al. (2012) indicated that due to the leading role of management in an organization, it could contribute significantly to innovation management. Lampikoski (2012) declared that the interface company, due to its investment on management abilities, could benefit from green innovations and gain stable competitive advantages, because management abilities allowed the company to direct the required research plans, realize investment opportunities and revolutionize the carpet industry. Yuan (2013) assessed the effect of CEO’s prior experiences on firm innovation in active American companies in the biotechnological industry and found that a certain type of experience is not necessarily effective on innovation, but a set of experience could contribute to the issue.

Fitjar et al. (2013) by working on Norwegian companies reported that intellectual managers and good relationship with international companies could affect the corporate innovation, significantly. Boermans and Roelfsema (2013) stated that work experience has no significant effect on the innovation of Indian companies and among the variables of educational record the one that is related to foreign trade has only a significant effect on firm innovation. Chen (2014) reported that the level of education and work experience related to CEO industry has a positive effect on innovation in these countries. Furthermore, CEO power could modify such relationship, positively, such that, by introducing a competent CEO, managers with human capital allocate more resources for innovative activities. Custodio et al. (2015) declared that managers that picked up general managerial skills during their career come up with more innovations and recorded more inventions, in that managers are equipped with some skills which are used for the revival of failed innovation projects. Finally, Sarol and Abebe (2017) found that powerful CEOs are more inclined...
toward pursuing exploratory innovations, such that there is a positive relationship between CEO power and exploratory innovations:

\( H1. \) There is a significant relationship between management competencies and firm innovation.

2.2 The relationship between management entrenchment and firm innovation

Driver and Guedes (2012) described the possibility of existence of a relationship between the mechanisms of corporate governance (and as a result management entrenchment) and the costs of research and development through three channels and said that first, corporate governance could decrease the cost of investment in long-term projects and by uncertainty could become like innovative investment. Second, corporate governance could reduce self-interested behaviors. The third channel, however, nullifies the effect of corporate governance on research and development and cancels out the advantages of alignment of interests between managers and shareholders. This is due to the fact that some scholars, such as Aghion and Tirole (1997) introduce over-monitoring as one of the dangerous factors that reduce management autonomy. Since owners prefer liquid assets to uncertain assets, the interests of owners and shareholders are in conflict with innovative investments. At the national level, macro-corporate governance, like legally developed systems and financial development outweighed the agency costs and this is where the investment efficiency enhances in research and development activities (Chu et al., 2016).

The existence of information asymmetry between managers and other beneficiaries is one way to facilitate the entrenchment. The strategic position of managers enables them to control the information access and limit the access of others. Managers behave in a way to further the information asymmetry between themselves and other beneficiaries and to facilitate their discretionary behaviors. Managers by investing in assets, which are more informed of, extend the information asymmetry. This could make the information and understanding of them more complicated for shareholders and potential managers. Accordingly, shareholders become more dependent and this is where discretionary behaviors are provided for managers. Investing in innovative activities is among those investments that increase the information asymmetry, in that research and development (R&D) comprises a huge bulk of knowledge, which is hard to transfer and this could limit the control of shareholders on the behaviors of shareholders. Therefore, it is predicted that the increase in research and development costs could facilitate management entrenchment (Dhaoui and Jouini, 2011).

Xiao (2010) indicated that when overinvestment is probable in a company, the relationship between protecting the rights of shareholders and investing in research and development activities becomes negative. Hillier et al. (2011) expressed that an effective support is provided for investors in countries with advanced financial systems and powerful corporate control mechanisms are less sensitive to local cash flows for the costs of research and development. Further, those mechanisms of corporate governance, which simplify the investment in the fields of research and development include, protecting minority shareholders, proper law enforcement, bank-based financial system and effective board control. According to the results of this study, we could conclude that the mechanisms of corporate governance are of the utmost importance in investing in research and development. Humphery-Jenner (2011) by expressing that managers are risk-averse in general and over risk-aversion could decrease shareholders’ wealth evaluated the impact of anti-control measures of managers on innovative activities and value creation. The obtained results showed that anti-control measures may encourage the managers to create value, increase innovation and at the same time enhance agency differences derived from management entrenchment. Driver and Guedes (2012) noticed that corporate governance
could bring about more decrease of research and development activities (either for individual indices or for collective ones).

Chemmanur and Tian (2013) revealed that companies with more anti-control measures are more innovative, as well. They justified such an effect by saying that the increase of anti-control measures could alleviate short-term pressures from the market side on managers and allow them to concentrate solely on long-term value creation. Aghion et al. (2013) reported that institutional ownership could lead to the growth of innovation. They declared that the positive effect of institutional ownership on innovation is due to job concerns of managers, such that institutional ownership could elevate managers’ motivation for innovation, because risky projects lower their professional risk.

Bingxiang et al. (2014) declared that there is a negative and significant relationship between managerial entrenchment and research and development. Their results indicated that such a negative relationship could be inhibited through increase of managerial compensation and ownership concentration, though the increase of board dependence could intensify such a relationship. Chakraborty et al. (2014) discovered that the increase of anti-control managerial measures could reduce the number inventions and awards. However, this negative relationship was evident in low-tech industries. Such a relationship is not statistically significant in high-tech industries. Their results illustrated that the relationship between corporate governance and research and development become stronger, especially in countries with weaker governance. Finally, Amore and Bennedsen (2016) reported that companies with weak governance design less green innovations. This negative relationship between weak corporate governance and green innovation become stronger, especially in companies with smaller institutional ownership:

H2. There is a significant relationship between managerial entrenchment and firm innovation.

2.3 The relationship between agency cost and firm innovation

According to the agency theory introduced by Jensen and Meckling in 1976, the principal (shareholder) appoints the agent to run a company. Obviously, it is logical to imagine that managers follow certain objectives, which are basically different from that of the shareholders. In fact, instead of maximizing the wealth of shareholders, they pursue their own interests. Shareholders are more willing to see that the manager makes some decisions, which elevate the stock value, while the manager is intended to increase the business of the company and his/her interest, which does not necessarily increase the stock value (Ammari et al., 2016). The agency theory predicts that the existing differences between the shareholder and manager could lead to agency costs and this, in turn, is detrimental to shareholder’s value (Chang et al., 2016). Information asymmetry and conflict of interest are two major factors, which cause agency costs (Zhang and Cao, 2015). Information asymmetry in financial markets means that one of the parties to the deal has better information than the other. Theoretical models foresee that the quality of higher disclosure could decrease the information asymmetry between the involved parties in the capital market and consequently lower the capital cost (Bhattacharya et al., 2013). Conflict of interest among managers and shareholders, especially in the time of entrenchment, is more intensified (Elyasiani and Zhang, 2015).

Firm innovation contributes significantly to the stability and value enhancement. Investing in innovative activities, however, entails more risk, compared with investing in capital expenditures, in that such investments are mostly subject to failure (Bhagat and Welch, 1995). Innovation is time-consuming and this is the salient feature of investment,
which could cause the cash flow deriving from such investments to be longer than the tenure of managers (Gibbons and Murphy, 1992). Therefore, risk-averse managers may not be leaning toward investment in innovation. In total, companies with no innovation would lose their market value (Chakraborty et al., 2014).

Agency costs would lower the investment value in research and development and would decline its functionality, as well. For example, when an information asymmetry exists between managers and shareholders, managers are more inclined toward self-interested efforts, rather than performing efficient research and development activities. Thus, agency costs could increase uncertainty in innovation activities (Chu et al., 2016).

O’Connor et al. (2013) carried out a research on the sensitivity of research and development costs about financial market frictions. They believed that in the world without friction, all companies will pursue investment projects with positive net present value. So, the level of research and development costs will not be influenced by the CEO compensation. By agency costs, however, companies would not be able or are not willing to follow all investment projects. Hence, companies with considerable agency costs will spend less on research and development:

\[ H3. \text{ There is a significant relationship between agency costs and firm innovation.} \]

### 2.4 The relationship between managerial overconfidence and firm innovation

Studies conducted on the realization of contributing factors to research and development costs can be classified into two groups. A group of them are concerned about some external factors, including market system, state behavior, right of ownership and the other group is about the internal factors, like management characteristics, firm size, business performance, capital structure, profitability and corporate governance mechanisms, which affect the costs of research and development. Most of such research studies suffer from a major defect, that is, managers’ irrational behaviors. However, most of the economic resources approved that people are not usually logical and factors, involving loss aversion, time preference and overconfidence could bring about some shortcomings in the process of decision making (Yong-hia, 2010). As declared by scholars, three factors contribute significantly to the overconfidence of managers: the illusion of control, a high degree of commitment to particular outcomes, abstract reference points. Managers believe that the situation is under control. Moreover, they are fully committed to the firm performance, in that their wealth and their value of human capital are different from the firms’ share price. Finally, investment decisions of a company are complicated and their prosperity is under the influence of several factors. Under the influence of abstract reference points, financial managers are prone to exaggeration and overestimation in evaluating their capabilities to realize lucrative investment opportunities (Chen et al., 2014). Many conducted studies emphasized on the ways the managers’ overconfidence may affect the investment decisions.

Malmendier and Tate (2005) by concentrating on future cash flows (as one of the sources overconfidence) indicated experimentally that managerial overconfidence could cause investment decision bias (merger and acquisition). According to the findings of Ben-David et al. (2012), compared with other managers, overconfident managers are more inclined toward investment activities. Galasso and Simcoe (2011) expressed that overconfident managers (who concede less possibility for bankruptcy) are more enthusiastic about innovative activities. Such an impact is increasing in competitive industries, as well. Yong-hia (2010) showed that managerial overconfidence has some positive effects on research and development costs. Shanbui et al. (2013) indicated that managerial overconfidence has some positive and significant effects on investment in innovative activities, such that this impact is only existed in high-tech industries and companies with state ownership. Herz et al. (2014) stated that the relationship between managerial
overconfidence and innovation is more complicated than those results, which are obtained in prior studies. They claimed that how overconfidence affects the innovation depends on the type of managerial overconfidence. Their results illustrated that judgmental overconfidence has negative effect on innovation:

\( H4 \). There is significant relationship between managerial overconfidence and firm innovation.

3. Research methodology
The present study is practical in terms of objective and descriptive-correlational in terms of method. Type of data used in this study was quantitative and even the qualitative variables, such as managerial overconfidence, managerial entrenchment, etc., were turned into quantitative using innovative models and methods in similar foreign studies and were applied in the research models. The statistical population comprises all listed companies on the Tehran Stock Exchange active in one of the following industries:

1. automotive and parts;
2. pharmaceutical;
3. cement, lime and plaster;
4. chemicals;
5. food, except sugar;
6. basic metals;
7. rubber and plastic; and
8. machineries and equipment.

The statistical sample of study is selected using systematic removal sampling and based on the following criteria:

1. being listed in Tehran Stock Exchange before the fiscal year of 2009;
2. having financial year-end on March 20;
3. having no change in their fiscal years during the period of study (2009–2015);
4. having presented the required information for calculating research variables; and
5. not being affiliated with holding, investing, and insurance companies.

Given the above-mentioned criteria, a total of 125 companies were selected as the sample of study. The highest frequency was related to “Automotive and parts” industry with 21 companies and the lowest was for “rubber and plastic” industry and “machineries and equipment” industries, each with nine companies.

3.1 Research model and definition of variables
The research model designed concerning the hypotheses of the study as follows:

\[
\text{INNO} = a_0 + b_1 \text{MANABI} + b_2 \text{MANENT} + b_3 \text{AGENCY} + b_4 \text{OVER} + b_5 \text{SIZE} + b_6 \text{IO} + b_7 \text{BH} + b_8 \text{LEV} + \epsilon,
\]

where INNO is innovation, MANABI is managerial ability, MANENT is managerial entrenchment, AGENCY is agency costs, OVER is overconfidence, SIZE is firm size, IO is institutional ownership, BH is substantial ownership and LEV is financial leverage.
Desired regression coefficients are \( b_1, b_2, b_3 \) and \( b_4 \), which are corresponding to the research hypotheses. Statistical hypotheses related to each regression coefficient proposed as follows:

\[
\begin{align*}
H_0 & : \beta_i = 0 \\
H_1 & : \beta_i \neq 0, \quad i = 1, 2, 3, 4.
\end{align*}
\]

\( H_0 \) hypothesis expresses that there is no significant relationship between respective independent variable and firm innovation. It is obvious that in case of rejection of \( H_0 \) hypothesis, the respective hypothesis with the regression coefficient being tested is rejected, as well.

In this paper, innovation has the role of dependent variable. To measure innovation based on Chakraborty et al. (2014), the following index is used:

\[
\text{INNO} = \frac{\text{CITATIONS} + \text{INNOVATION}}{\text{AVERAGE}}.
\]

where, CITATIONS is the number of awards, INNOVATION is the number of registered inventions and AVERAGE is the average number of awards and registered inventions in the related year-industry.

In this study, four variables of managerial ability, managerial entrenchment, managerial overconfidence and agency costs were used as independent variables:

1. Managerial ability (MANABI): Demerjian et al. (2012) method is employed to examine the managerial ability. In this method, first, the amount of firm efficiency is calculated as follows:

\[
\text{EFFICIENCY} = \frac{\text{SALES}}{\text{COGS} + \text{SGA} + \text{PPE} + \text{OPLEASE} + \text{RD} + \text{GOODWILL} + \text{INTAN}}
\]

where EFFICIENCY is the firm efficiency, SALES is the amount of sales, COGS is the cost of goods sold, OPLEASE is the cost of operating lease, RD is the cost of research and development, PPE is the property, machinery and equipment value, INTAN is intangible net assets, GOODWILL is the purchased goodwill and SGA is general, office and sales costs. Then, a part of firm efficiency, which is controlled by its intrinsic features, is isolated from management ability using the following regression model and the residuals are defined as management ability:

\[
\text{EFFICIENCY} = a_0 + a_1 \text{SIZE} + a_2 \text{MARKETSH} + a_3 \text{FCF} + a_4 \text{AGE} + a_5 \text{FCI} + e,
\]

where SIZE is the firm size (natural logarithm of assets), MARKETSH is the market share (the proportion of sales to total sales in the related industry), FCF: free cash flow marker (1 for year-companies with positive cash flows, otherwise 0), AGE is the firm age (natural logarithm of number of differences of current year from the year the firm established) and FCI is export marker (1 for companies with export, otherwise 0).

2. Managerial entrenchment (MANENT): to measure the managerial entrenchment, principal component analysis (PCA) technique of Lin et al. (2014) was used based on the following four variables: CEO ownership, CEO duality, board compensation and CEO tenure. Using the PCA, the above said variables of corporate governance are summarized in a numeric index.
(3) Agency costs (AGENCY): according to Wellalage and Locke (2011), the following three indices are used for evaluating agency costs:

\[
\begin{align*}
\text{SATA} &= \text{SALES}/\text{TA} \\
\text{OESA} &= \text{OE}/\text{SALES} \\
\text{GAESA} &= \text{GAE}/\text{SALES},
\end{align*}
\]

where SATA is the asset turnover ratio, OESA is operating costs to sales ratio, GAESA is general and office costs to sales ratio, SALES is sales, TA is total assets, OE is operational costs and GAE is general and office costs.

(4) Overconfidence (OVER): according to Duellman et al. (2015), the ratio of capital expenditure to total assets is used to establish managerial overconfidence, such that, if the ratio is higher than the industry median that company suffers from managerial overconfidence. In such a case, the OVER variable is equal to 1, otherwise 0. In other words, the overconfidence variable is used as a marker in the research model.

In order to omit the effect of other variables, which may affect the relationship between independent variables and the dependent ones, the effect of the following variables is monitored:

- Firm size (SIZE): natural logarithm of total assets.
- The percentage of institutional shareholders (IO): a proportion of total shares, which are available for institutional shareholders (such as banks, insurances, etc.).
- The percentage of major shareholders (BH): a proportion of shares available for shareholders with more than 5 percent of the company shares.
- Financial leverage (LEV): total debts to total asset ratio.

4. The results
The analysis of research hypotheses conducted in descriptive and inferential level. In the descriptive level, some statistical indices like mean and standard deviation were used and in inferential level, the test of correlation coefficient and regression coefficients were used in R Software. Table I displays the descriptive indices of research variable. By comparing the mean and median values of innovation index (INNO), we could realize that the statistical distribution is skewed to the right side. In other words, the number of companies with a high rate of innovation is extremely less than those with a low rate of innovation. More accurately, most companies have medium or lower than medium innovation rate.

One of the basic hypotheses in regression models is the lack of co-linearity among descriptive variables, otherwise the regression coefficients are skewed and this could affect \( t \)-test statistics and consequently the test results. Correlation coefficients test could be used for this purpose. Correlation coefficients have different types. To evaluate more accurately, both Pearson and Spearman correlation coefficient is used. The former is calculated according to the actual values of variables; while the latter is achieved using the observation ranks and is more stable against outlier observations (Table II).

In this table, among the descriptive variables, the Pearson and Spearman correlation coefficients were shown above and under the main diameter. Based on these coefficients, all correlational coefficients, except the correlation coefficient between two variables of institutional ownership and major ownership, were small and less than 0.5. Therefore, if it is assumed that linearity is going to cause a problem among descriptive variables (affect the results of hypothesis testing), it is due to the linearity between variables of institutional and
major ownership. To control and evaluate the issue, regression models of the study are estimated once by considering the institutional ownership and once without the variable. The results obtained from the analysis of research hypotheses are presented as follows.

According to the results obtained from Table III, the relationship between management ability (MANABI) and managerial entrenchment (MANENT) and firm innovation is significant at 0.1 error level (sig. < 0.1). However, the relationship between managerial overconfidence (OVER) and firm innovation is not significant (sig. > 0.05). Moreover, for none of the sales on asset (SATA), operating expenses on sales (OESA) and general and office expenses on sales (GAESA) indices do the agency costs have a significant relationship with firm innovation (sig. > 0.05). Given that, H1 and H2 are accepted, but H3 and H4 is rejected. It is noteworthy that according to the results of F-Limer and Hausman tests, the method of equal effects was used for estimating the hypothesis model. Further, F-statistics indicates that all estimated models were significant (sig. < 0.1) and only a tiny percentage of the variance of the dependent variable is elucidated by the existing descriptive variables in the model ($R^2 = 2$ percent). Finally, based on Durbin–Watson statistic, there is no serial correlation among model residuals (1.5 < DW < 2.5).

The results achieved from research model fitting were depicted in Table IV after removing the co-linearity. According to the results of F-Limer test, after removing co-linearity, the method of equal effects was also used for research model fitting. As can be seen, after co-linearity removal (setting the IO variable aside), fairly similar results were achieved, such that the relationship between management ability and managerial entrenchment and firm innovation is significant at 0.1 error level and the relationship of other independent variables with innovation is not considered as significant (sig. > 0.05). Hence, after co-linearity removal, the H1 and H2 are accepted and H3 and H4 are rejected.

5. Conclusion
The main objective of the present study is to evaluate the relationship between some of the management characteristics and a firm innovation. The characteristics used in this project for management are capability, entrenchment, agency costs and overconfidence. Innovation is the dependent variable of this study, which is measured by the ratio of the number of letter of appreciation received by the company to the average letter of appreciation of the

Table I.
Descriptive indices of research variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Sig.</th>
<th>Max.</th>
<th>Mean</th>
<th>Median</th>
<th>Min.</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Innovation</td>
<td>INNO</td>
<td>6/146</td>
<td>1/000</td>
<td>0/612</td>
<td>0/000</td>
<td>1/206</td>
</tr>
<tr>
<td>Firm efficiency</td>
<td>EFFICIENCY</td>
<td>4/959</td>
<td>0/848</td>
<td>0/864</td>
<td>0/007</td>
<td>0/324</td>
</tr>
<tr>
<td>Firm size</td>
<td>SIZE</td>
<td>14/1</td>
<td>14/000</td>
<td>13/800</td>
<td>10/2</td>
<td>1/508</td>
</tr>
<tr>
<td>Market share</td>
<td>MARKETSH</td>
<td>0/812</td>
<td>0/064</td>
<td>0/030</td>
<td>0/000</td>
<td>0/108</td>
</tr>
<tr>
<td>Free cash flow</td>
<td>FCF</td>
<td>1/000</td>
<td>0/859</td>
<td>1/000</td>
<td>0/000</td>
<td>0/349</td>
</tr>
<tr>
<td>Firm age</td>
<td>AGE</td>
<td>4/140</td>
<td>3/530</td>
<td>3/690</td>
<td>2/08</td>
<td>0/419</td>
</tr>
<tr>
<td>Export marker</td>
<td>FCI</td>
<td>1/000</td>
<td>0/968</td>
<td>1/000</td>
<td>0/000</td>
<td>0/176</td>
</tr>
<tr>
<td>CEO ownership</td>
<td>DIOWNER</td>
<td>36/000</td>
<td>0/0799</td>
<td>0/000</td>
<td>0/000</td>
<td>3/461</td>
</tr>
<tr>
<td>CEO duality</td>
<td>DUAL</td>
<td>1/000</td>
<td>0/333</td>
<td>0/000</td>
<td>0/000</td>
<td>0/472</td>
</tr>
<tr>
<td>CEO compensation</td>
<td>COMPEN</td>
<td>11/22</td>
<td>3/240</td>
<td>0/000</td>
<td>0/000</td>
<td>3/547</td>
</tr>
<tr>
<td>CEO tenure</td>
<td>TENURE</td>
<td>7/000</td>
<td>2/670</td>
<td>2/000</td>
<td>1/000</td>
<td>1/542</td>
</tr>
<tr>
<td>Asset turnover ratio</td>
<td>S3ATA</td>
<td>5/144</td>
<td>0/894</td>
<td>0/781</td>
<td>0/007</td>
<td>0/579</td>
</tr>
<tr>
<td>Operating expenses to sales ratio</td>
<td>OESA</td>
<td>4/472</td>
<td>0/830</td>
<td>0/858</td>
<td>2/715</td>
<td>0/331</td>
</tr>
<tr>
<td>General and office expenses to sales ratio</td>
<td>GAESA</td>
<td>136/666</td>
<td>0/295</td>
<td>0/060</td>
<td>0/000</td>
<td>4/994</td>
</tr>
<tr>
<td>Capital expenditure ratio</td>
<td>CAPEX</td>
<td>0/283</td>
<td>0/036</td>
<td>0/025</td>
<td>0/000</td>
<td>0/040</td>
</tr>
<tr>
<td>Percentage of institutional shareholders</td>
<td>IO</td>
<td>100/0</td>
<td>70/200</td>
<td>80/700</td>
<td>0/000</td>
<td>27/715</td>
</tr>
<tr>
<td>Percentage of major shareholders</td>
<td>BH</td>
<td>99/5</td>
<td>72/200</td>
<td>77/600</td>
<td>0/000</td>
<td>20/139</td>
</tr>
<tr>
<td>Financial leverage</td>
<td>LEV</td>
<td>6/171</td>
<td>0/655</td>
<td>0/618</td>
<td>0/105</td>
<td>0/589</td>
</tr>
</tbody>
</table>
## Table II

Pearson correlation coefficients (above the main diagonal) and Spearman (under the main diagonal) among descriptive variables.

<table>
<thead>
<tr>
<th></th>
<th>Management ability</th>
<th>Managerial entrenchment</th>
<th>Asset turnover</th>
<th>Operating expenses to sales</th>
<th>General and office expenses to sales</th>
<th>Overconfidence</th>
<th>Institutional ownership</th>
<th>Major ownership</th>
<th>Financial leverage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Management ability</td>
<td>1</td>
<td>0.085</td>
<td>0.284</td>
<td>-0.231</td>
<td>-0.134</td>
<td>0.043</td>
<td>0.093</td>
<td>0.083</td>
<td>-0.086</td>
</tr>
<tr>
<td>Managerial entrenchment</td>
<td>0.085</td>
<td>1</td>
<td>-0.070</td>
<td>0.084</td>
<td>-0.023</td>
<td>0.013</td>
<td>-0.203</td>
<td>-0.114</td>
<td>0.137</td>
</tr>
<tr>
<td>Asset turnover</td>
<td>0.413</td>
<td>0.006</td>
<td>1</td>
<td>0.081</td>
<td>0.009</td>
<td>0.144</td>
<td>0.001</td>
<td>0.014</td>
<td>0.007</td>
</tr>
<tr>
<td>Operating expenses to sales</td>
<td>-0.363</td>
<td>0.065</td>
<td>0.147</td>
<td>1</td>
<td>0.040</td>
<td>-0.041</td>
<td>-0.131</td>
<td>-0.035</td>
<td>0.335</td>
</tr>
<tr>
<td>General and office expenses to sales</td>
<td>-0.282</td>
<td>0.025</td>
<td>-0.305</td>
<td>0.191</td>
<td>1</td>
<td>0.033</td>
<td>0.004</td>
<td>-0.039</td>
<td>-0.016</td>
</tr>
<tr>
<td>Overconfidence</td>
<td>0.021</td>
<td>0.028</td>
<td>0.175</td>
<td>-0.001</td>
<td>-0.077</td>
<td>1</td>
<td>0.072</td>
<td>-0.007</td>
<td>-0.098</td>
</tr>
<tr>
<td>Institutional ownership</td>
<td>0.121</td>
<td>-0.140</td>
<td>0.068</td>
<td>-0.278</td>
<td>-0.138</td>
<td>0.078</td>
<td>1</td>
<td>0.630</td>
<td>-0.029</td>
</tr>
<tr>
<td>Major ownership</td>
<td>0.090</td>
<td>-0.071</td>
<td>0.117</td>
<td>-0.085</td>
<td>-0.063</td>
<td>0.027</td>
<td>0.096</td>
<td>1</td>
<td>0.079</td>
</tr>
<tr>
<td>Financial leverage</td>
<td>-0.094</td>
<td>-0.017</td>
<td>0.077</td>
<td>0.480</td>
<td>-0.020</td>
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Table IV: The results of model fitting of research hypotheses after colinearity removal.
Demerjian et al.'s (2012) model was used to measure the manager capability. In this method, a part of firm efficiency, which is not expressed by natural characteristics (including firm size, market share, free cash flow indicator, firm age and export indicator), is considered as manager capability. To assess management entrenchment, according to Lin et al. (2014), we used the analysis of main components based on four variables of CEO ownership, CEO duality, the board compensation and the board tenure. To measure the agency costs, three variables of asset turnover ratio, operational costs to sales ratio and public and office costs to sales ratio are used. Finally, according to Duellman et al. (2015), capital costs ratio was used to determine the managerial overconfidence. Moreover, four variables of firm size, the percentage of institutional shareholders, the percentage of major shareholders and financial leverage were controlled.

The statistical population includes all companies listed in Tehran Stock Exchange during 2009–2015 active in “automotive and part” industry, “pharmaceutical ingredients,” “cement, lime, and plaster,” “chemicals,” “foods, except sugar,” “basic metals,” “rubber and plastic,” and “machinery and equipment.” Using the systematic elimination sampling method, a number of 125 companies was selected as the sample of the study. The highest frequency was for “automotive and parts” with 21 companies and the lowest was for “rubber and plastic” and “machinery and equipment,” each with 9 companies.

Most of the required data for calculating research variables were extracted from audited financial statements of companies. This information was collected via Rah Avaran Novin Software. However, to extract the information related to the innovation index, we referred to reports of the board activities, which are available at Codal website. The statistical method used for testing research hypotheses is panel data regression models. In this method, we initially investigated the statistical distribution normality of the dependent variable and lack of co-linearity among descriptive variables using the Shapiro-Wilk and correlation coefficient tests. Then, using two other tests, namely, Limer and Hausman the appropriate method for estimating each regression model was established and finally, using the significance test of regression coefficients and $t$-statistic we decided whether the hypothesis is confirmed or rejected. All statistical analyses were carried out using the R Software.

To reach the objective of the study, four hypotheses were designed, each of which describes the relationship between one of the independent variables and the dependent one.

The obtained results indicated that there is a significant relationship between management ability and the innovation of companies under study, such that regarding the positive sign of regression coefficient for the variable of management ability (MANABI) it can be inferred that by the increase of managerial ability the number of awards (as the index innovation) is increased, as well. Sariol and Abebe (2017) conducted a study on the effect of management ability on the type of innovative activities (exploration and exploitation) and found that powerful CEOs are more prone to pursue explorative innovations, such that a positive relationship exists between CEO power and explorative innovations. Further, these results are in line with that of the Custodio et al. (2015), Chen (2014), BarNir (2014), Fitjar et al. (2013), Lampikoski (2012), Garcia-Morales et al. (2012), Vaccaro et al. (2012), Kelley et al. (2011), Salimzadeh et al. (2016), Najafi and Abbasi Menzeh (2015) and Mazloomi et al. (2013). The result of the present paper is in contrast with that of the Boermans and Roelfsema (2013), which assessed the impact of managerial ability on the innovation of Indian companies. According to the results achieved from this study, work experience has had no significant effect on the innovation of Indian companies. Among the variables of educational record only the one that is related to foreign trade has a significant effect on firm innovation. The reason of difference may be due to the existence of different measurement methods for management ability. The study compared has used two indices of experience and educational record (local/foreign trade), while the present study employed the Demircan method for measuring management ability. Based on the results, the increase of managerial...
ability could lead to the growth of innovation in companies listed in Tehran Stock Exchange. Hence, the boards of companies, which are listed in Tehran Stock Exchange and are active in competitive industries should take this point into consideration that the existence of highly capable managers is one of the factors increasing the innovation of a company with the aim of reaching high competitive standards.

Moreover, results showed that managerial entrenchment of companies under study has a significant relationship with the innovation. Regarding the negative sign of regression coefficient of managerial entrenchment (MANENT), we could conclude that the increase of this variable could attenuate a firm’s innovation.

Amore and Bennedsen (2016) carried out a research on the effect of corporate governance on environmental innovations. According to their findings, companies with weak governance come up with fewer green innovations. Such a negative relationship is stronger between weak corporate governance and green innovation, especially when companies have smaller institutional ownership. The results of this study are in line with that of the present study and the results of Hasan et al. (2015), Chakraborty et al. (2014), Bingxiang et al. (2014), Aghion et al. (2013), Chemmanur and Tian (2013), Driver and Guedes (2012), Humphrey-Jenner (2011), Hillier et al. (2011), Dhaoui and Jouini (2011), Xiao (2010) and Varamesh et al. (2014). According to the obtained results, the increase of managerial entrenchment could decrease the innovation of companies listed in Tehran Stock Exchange, significantly. Hence, it is emphasized that the boards of listed companies in Tehran Stock Exchange, which are active in competitive industries, should benefit from stronger corporate governance mechanisms to prevent profiteer managers. Some managers may pursue their own personal interests by misusing the mechanisms of corporate governance and adopting anti-control measures instead of dealing with innovative activities.

In addition, based on three variables of asset turnover, operating expense on sales and general and office expenses on sales, there is no significant relationship between agency cost and firm innovation.

The number of conducted studies on the relationship between agency costs and innovation is limited and we have no such a research in Iran, so far.

In the end, results showed that the managerial overconfidence in companies under study has no significant relationship with the amount of innovation in these companies. Regarding the negative sign of regression coefficient of overconfidence (OVER), we realized that the increase of managerial overconfidence would decrease the firm’s innovation. The negative relationship between managerial overconfidence and innovation in Tehran Stock Exchange is in contrast with the positive relationship of these two factors in Chinese capital market reported by Yong-hai (2010). Shanhui et al. (2013), Hirshleifer et al. (2012), Galasso and Simcoe (2011) and Ben-David et al. (2010) have also noticed a positive relationship between managerial overconfidence and innovation.

The findings of Herz et al. (2014) and Chen et al. (2014) showed that managerial overconfidence often destroys the value of research and development costs and has a negative effect on innovation. The reason why there is a contrast between the conducted studies and the present one may be due to the difference between governing terms and conditions of companies listed on the Tehran Stock Exchange and those of other countries.
According to the obtained results, there is no significant relationship between managerial overconfidence and innovation in companies listed on the Tehran Stock Exchange. Thus, we mention the active companies in competitive industries that though the presence of overconfident managers could improve the performance of their desired companies, it actually has no effect on firm innovation.

References


Further reading


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Abstract

Purpose – The Pension Trust Company (PTC) in Ghana is the sole agency responsible for the management of the first-tier pension scheme as well as processing of claims submitted by beneficiaries for this scheme. The claim processing system at PTC was wrought with significant delays resulting in severe customer dissatisfaction and hardship to retirees. Hence, a new system – Age 54+ project – was developed to address the problems related to claims processing. The purpose of this paper is to report on the efficiency gains from the new claim processing system implemented at PTC and to use the philosophies behind the lean operations concept to explain the results.

Design/methodology/approach – Data for this study were obtained from the benefits system of PTC for the period 2009–2013. The data consist of a series of benefits processing time for two groups of 56,000 claimants – those cleared under the Age 54+ project and those cleared under the old processing system. The processes of the two claim processing systems were analysed and their processing times compared.

Findings – The new system – Age 54+ – decreased the average processing time for new claims by 20 per cent. The new system is a simple approach which is driven by a “Let’s Start in Time” idea.

Originality/value – The operations management literature suggests that process redesign approaches and the implementation of continuous improvement techniques represent mechanisms for achieving performance improvements at governmental agencies. This study shows and discusses the redesign of a social security scheme process using a lean operation concept of waste elimination method and application of kanban to deliver performance improvement.

Keywords Ghana, Social security, Claim processing time, Lean systems

Paper type Research paper

1. Introduction

The Ghana National Pension Act of 2008 (Act 766) stipulates a contributory three-tier pension scheme consisting of: a mandatory basic national social security scheme; a mandatory occupational pension scheme; and finally, a voluntary provident fund and personal pension scheme. In Ghana, the agency responsible for the collection of contributions and the payment of retirement benefits under the first-tier scheme – basic national social security scheme – is the Pension Trust Company (PTC). The second- and third-tier schemes – occupational pension scheme and the provident fund scheme, respectively – are usually privately managed by trustees approved by boards of organisations. This study therefore focuses on the social security scheme which is managed by PTC as it appears to be challenged by unduly longer claim processing time.
Globally the importance of social security and pension schemes cannot be overemphasised as they provide two important functions within societies: a source of funds, for possible borrowing, for development initiatives and a source of income for retirees. Social security and pension schemes provide important sources of finance for both the public and private sectors in most countries. PTC makes available to the Government of Ghana long-term loans for the financing of current and capital expenditures for national development. Social security schemes also serve as mechanisms by which individuals in the workforce are assured of some level of income when they retire from the workforce. In most social security systems, the contributions received from current contributors are, usually, used to provide benefits to those who are retired with the expectation that future contributions will also be available to support those in the workforce at that time. Consequently, Whitaker (1998) notes that it would be ideal if every member of a community could be protected by social security as that fosters solidarity.

Dorfman and Palacios (2012) opine that pensions and social insurance programs aim to prevent a substantial loss in consumption power as a result of old age, disability or death and hence form an integral part of any social protection system. Rofman and Oliveri (2012) also argue that social security schemes are programs instituted by nations to transfer the responsibility of social risks (disabilities, old age, victim of natural disasters, among others) to the state where the informal or traditional systems of social protection are insufficient or not working properly. The PTC in Ghana is a governmental organisation and as such is fraught with inefficiencies, especially in claims processing.

Given, the benefit of social security schemes, the issue of delays in processing benefits of claimants or beneficiaries remains a problem, especially in most developing countries. Undue delays in benefits processing undermine the objective of social security schemes as the claimants or beneficiaries get worse off socially and economically by such delays. PTC, in Ghana, over a long time had a problem of bad image due to delays in claim processing. Therefore, the question of interest, in this study, is whether the implementation of operations management (OM) lean principles and tools such as kanban and single-minute exchange of die (SMED) can be used to bring efficiencies in the processes of governmental organisations. Hence, a project – Age 54+ project, based on the broad concepts of waste elimination, standardisation, accountability and visibility (Hill, 2012) – was implemented by the Trust to address the problem of delays and the attendant customer dissatisfaction. Consequently, this study seeks to compare the claim processing times under two scenarios – the old claim processing system and the Age 54+ project.

The rest of the paper is organised as follows. We first provide a background of the social security scheme in Ghana and provide a brief reference on other schemes in developed countries. Second, the theoretical background of the lean principle, which informs the Age 54+ approach, is provided with special focus on public sector organisations. We then present an analysis of the general claim processing structure at PTC. This is followed by a description of the structure of the Age 54+ project processing system. The method and results of the study are then presented and discussed. The study then ends with conclusions and managerial implications for further improvement of the claim processing at PTC.

2. Social security scheme in Ghana
Social security schemes are available in most countries – both developing and developed countries though the extent of coverage varies in both developing and developed countries. The social security legislation in Ghana was enacted in 1965 (Asibuo, 1976). The emergence of the system was precipitated by the change in the socio-economic structure in Ghana – reflected in establishment of industries, urbanisation, rural-urban migration, rapid population growth and the spread of formal education – that followed the attainment of independence from colonial rule in 1957. Boon (2007) observed that before the institution of a
formal social security system in Ghana, the indigenous Ghanaian society had a traditional form of social protection. The traditional form of social security, in Ghana, had been based on the extended family system as well as one’s children to address risks from disability, sickness, loss of a key bread winner of a household, old age and victims of natural disasters. However, with the advent of globalisation, the Ghanaian society is getting westernised. An impact of this is a gradual and systematic disintegration of the extended family structure which had been relied upon to provide the traditional social security, and thus, necessitating the need for other means of attaining social protection (Boon, 2007).

The shift away, largely, from the extended family structure to a more formal and public regulated system in respect of social protection has been in operation for some decades now in Ghana. However, this formal and regulated social protection system also has some setbacks. For example, the levels of social security benefits, in Ghana, are not usually connected to the prevailing economic conditions, hence, creating economic challenges for retirees. This primarily is explained by the poor and unstable macro-economic environment and conditions in the country. The macro-economic conditions usually get worse to the extent that annual adjustments to benefits of retirees rarely provide equal and commensurate compensations for depreciated benefits of retirees. Besides, from a demographic standpoint, the social security pension scheme in Ghana should not be in distress and must provide better benefits to retirees as the ratio of contributors to beneficiaries stands at 40:1 (Atabugum, 1997). However, poor investment decisions by the Trust which are underpinned by political interferences coupled with the volatile economic situation in Ghana explain the financial distress of the Trust and the disconnect between the levels of social security benefits and the prevailing economic conditions.

In some developed countries such as Britain and New Zealand, the social security schemes cover almost every citizen and apply to most risks. However, in Ghana, even though under the Provisional National Defence Council law 247, workers in both the formal and informal sectors are permitted to be part of the scheme, the scheme is largely subscribed by workers in the formal sector and covers only such contingencies as old age, invalidity, death and survivors’ benefits. Ghana has two social security schemes running concurrently – the PTC scheme and the government scheme (CAP 30). The CAP 30 scheme is funded by the consolidated funds of the government and is targeted towards military and police officers and others in the security agencies (Kumado and Gockel, 2003). Under the PTC scheme, employee and employer contributions are 5.5 and 13 per cent, respectively. The annual indexation method is the main approach for adjusting the levels of pensions paid in Ghana and the Trust operates with a retirement age of 60 years.

3. The lean principle in public service organisations

Most public organisations, under the pressures of myriad stakeholders and their expectations, have struggled to achieve efficiency in their operations (Corrigan and Joyce, 2000; Radnor and McGuire, 2004; Greiling, 2005). Historically, public services seem to be lower on the ladder of efficiency relative to their counterparts in the private sector. This is because, for a very long time, most providers of public services have not faced the threat of competition. Usually the patrons of public services are more or less captive users with little or no choice of providers. This situation makes most public service organisations to be more supplier driven than customer driven. And very often there are no performance metrics to guide behaviour and decision making. However, recent deregulation policies in public services – healthcare, insurance, banking, etc. – coupled with pressures on public expenditures have made it imperative for managers of public service organisations to constantly search for new and better ways of driving productivity upward while at the same time ensuring effectiveness in meeting the needs of citizens (Lenk, 2002; Karwan and Markland, 2006). For example, in the UK, the government has introduced reforms that
permit patients to choose where they go for medical treatments with provisions made to follow patients with funding (Bhatia and Drew, 2006). Similarly, in Ghana, with the establishment of the National Health Insurance Scheme in 2003, many private medical institutions have been admitted to the scheme and thus provide choices for patients.

The challenges in public services and how OM principles could be used to address them have not received much attention in OM literature. Slack et al. (2004) indicate that the gap between research and practice is very wide, particularly as related to the provision of public services, even though the share of public services in respect of gross domestic products of countries is significant. Hence, the application and development of OM theories to guide managers of public service organisations will be beneficial.

In this study, we demonstrate, using a detailed case study, how OM lean principles can be used to ensure operational efficiency and effectiveness in the execution of the social security scheme service in Ghana.

Customers nowadays desire more from their service providers: high-quality services, efficient and reliable delivery, reasonable cost, etc. This brings to the fore the importance of value creation in a supplier–customer relationship.

The fundamental thrust of lean thinking is “value” (Womack and Jones, 1996, 2003; Atkinson, 2004). Womack and Jones (2003) define “value” as the ability to deliver a product and service a customer wants with minimal time between the moment the customer asks for the product or service and the actual delivery at an acceptable price. Hence, “value” can also be simply defined as the difference between expected benefit of a product or service and its cost. Value then is optimised, especially from customers’ perspective, when the margin of difference between benefit and cost is increased. Associated with the concept of value is, of course, waste elimination where waste refers to anything that does not add value to the customer or client. In the case of claim processing at PTC, delays which are usually associated with frequent visits to PTC offices by claimants reduce the margin of difference between the expected benefits of the service and the cost of it and hence take away from value and lead to waste. Thus, the aim of lean is achieved, in an operating system, by eliminating waste which includes reducing process time and simplifying operations (Womack et al., 1990; Seth and Gupta, 2005; Bhatia and Drew, 2006). The presence of waste in an operation reduces the value creation effort. Russell and Taylor (1999) and Taj and Morosan (2011) define waste as anything other than the minimum amount of equipment, effort, materials, part, space and time that are needed to add value to a product or service. The principle of lean rests on some critical pillars or underlying assumptions without which it is difficult to make lean work. Radnor and Boaden (2008) and Radnor and Osborne (2013) indicate these critical pillars as:

- specifying the value desired by the customer;
- identifying the value stream for each product or service providing that value and challenging all of the wasteful steps;
- making the product or service flow continuously;
- introducing pull between all steps where continuous flow is impossible; and
- managing towards perfection in order to ensure that the number of steps and the amount of time and information needed to serve the customer continually falls.

Fulfilling these underlying assumptions and achieving the aim of lean require the employment of lean methods and a toolkit. Russell and Taylor (1999) and Radnor (2010) indicate these methods and toolkits, among others, as:

- Kaizen.
- 5S (Sort, Straighten, Shine, Standardise and Sustain).
Some researchers (Womack and Jones, 2003; Kollberg et al., 2006) observe that lean methods have been gradually transferred from pure manufacturing environments to service environments, especially the public service. However, there is a dearth of research that highlights these applications in the service sector. Bhatia and Drew (2006) report of a UK government office processing large volumes of standard documents using lean methods through which lead times were reduced from 40 to 12 days. In the private sector, the same authors report of a European bank using lean methods and reducing the processing time for mortgage applications from 35 to 5 days.

Despite the moderate successes achieved by the application of lean principles in public service, Radnor and Boaden (2008), argue that lean, as it pertains in public service, is not “pure” when juxtaposed with what has been developed and implemented in manufacturing and some private service organisations. The argument fundamentally is hinged on the fact that the assumptions that underlie public service operations differ from manufacturing and private service operations. This implies that the application of lean principles in public service operations should be more adaptive than adoptive. The absence of many studies of lean applications in the public service sector might be attributable to the adaptions that might be required and the uncertainty associated with the potential benefits of such implementations. In this study, we take a bold step to examine the impact of the lean approaches of SMED (i.e. changing internal setups into external setups) and the pull system facilitated by the use of kanban which are adapted in processing claimants of social security benefits at PTC in Ghana under a project called “Age 54†”. The approach under this project was to flag out members of a social security scheme who were aged 54 years and above for processing of retirement benefits. In other words, how can potential beneficiaries be identified early and how can they be pre-processed even before they reach their retirement age with the goal of minimising the processing and waiting times associated with retirement claims.

4. General claim processing at PTC

We document in this section the process flow for the claim process at PTC, Ghana. The claim or benefit processing at PTC begins with the submission of an application letter by the claimant to the claimant’s PTC branch. On the receipt of the letter, an application form (SS4) is filled at the PTC branch and the necessary due diligence or clearance including verification of credentials is carried out before the final payment of benefit to the claimant. In the case where the member is not cleared under the Age 54† project, the member is referred to the Trust’s Clearance Office for clearance. After the branch receives clearance from the Clearance Office, the branch forwards the claimant’s details to Pension House for final payment. Figure 1 is a flow chart of the entire process.

The phase of the clearance or due diligence before the final payment of the benefit was the bottleneck in the claim processing procedure at the Trust and hence the justification for the Age 54† project. As seen from Figure 1, the Age 54† project seeks to address the problem of lengthy processing time between claim application and claim payment. Lean principles require the identification of wasteful steps in processes which in this case is represented by “Dispatch to records for clearance” (see Figure 1).

The problem of lengthy processing time is, primarily, a result of incomplete or incorrect bio or personal and financial data on claimants at the time of application. This will imply
that the processing of the claim will have to be delayed until the records are corrected. This obviously implies waste and undue elongation of the claim processing time which could be eliminated, if record accuracy could be done “offline” as dictated by the lean concept or tool of SMED where some internal setups are identified and converted to external setups in order to reduce the entire process time or duration. Applicants who are not previously captured under the Age 54+ project are routed through the old system of clearance (1.0) before the final payment procedure begins (2.0) as indicated in Figure 1. When clearance requests are received from the branch, the Clearance Office undergoes all the clearance processes indicated in Figure 2. When there are any queries with the member’s information, the member’s branch is contacted to respond to the queries in order to complete the clearance process. The old clearance procedure (1.0) is as shown in Figure 2.

The final payment procedure (2.0) is as shown in Figure 3. One important aspect of the final payment procedure is the issue about the student loan guarantee clearance (see Figure 3). Applicants or claimants who have previously guaranteed students’ loan need to get clearance from the students’ loan department for payment of the student loan otherwise the amount owed in debt is deducted from the claimants’ final payment.

5. Claim processing under Age 54+ project

The board and executives of the Trust initiated the Age 54+ project to ensure that the processing time for benefits payment is reduced. The project employed young graduates who were to follow up with telephone calls (after letters have been issued) to members who were aged 54+ years to ensure that both their personal and financial data were complete to ensure faster processing of claims at the point of members’ retirements. This project
targeted this age category (54+) because though the normal retirement age by the Trust is 60 years, members could qualify for voluntary retirement from age 55 years. Under the Age 54+ project, acquisition of a blue card indicates evidence of being part or captured under the Age 54+ project. This pre-processing step is an example of the conversion of internal setup to external setup such that processing delays are minimised with regard to record verifications when the claimant achieves retirement age. Data errors are reduced ahead of time and valuable labour hours are not being spent to fix those errors when the actual claim processing is taking place. The possession of the blue card is also a signal or indication

**Notes:** SS4, application for old-age retirement and invalidity benefit form; MC, membership certificate; CF, cleared form

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**Figure 2.**
Old claim clearance procedure (1.0)
(i.e. kanban principle) that the claimant is ready to be processed for retirement benefits. The procedure for the acquisition of the blue card is as shown in Figure 4.

In order to expedite the overall claim processing time, the Trust’s system flags all members who turn 54 years at a particular time. These individuals are subsequently written to by the Trust to initiate the blue card acquisition process. This prior clearance (in both personal and financial data) through the blue card acquisition is essential to ensure that by age 60 when the claimant applies for the benefits, the time required for the final payment to be made is considerably reduced. Again, this approach represents an application of the lean “kanban” system where further work in a process is visually indicated or signalled for prompt action to the end that waste is eliminated, and speed gained in the service delivery. Hence, by this system, a “pull” rather than a “push” system is being encouraged by the Trust. Besides, the introduction of the Age 54+ project – side by side with the old claim processing system – is an attempt to improve on the old claim
processing system. Conceptually, the design is similar to Disneyland’s fast pass system where customers issued with a fast pass jump to the front of a queue when the appointed time on the fast pass arrives.

6. Data and method
The data for this study were obtained from the benefits system of PTC, Ghana, for the period 2009–2013. Given that the data are from one organisation, this might be considered a case study. However, as a paradigm, this study falls in the realm of a quantitative study as opposed to an interpretivist case study. At the same time, the data came from the archived...

Notes: SSNO, social security number; DOB, date of birth; DJS, date joined scheme; SS1C, membership information update and application for membership certificate form; CF, cleared form; MC, membership certificate
records of the organisation. Given that organisations in developing countries are often not willing to share their records with researchers, the unit of analysis is the processing of claim. Even though the Age 54\textsuperscript{+} project commenced in 2003, data were available only from 2009 to 2013. The data consist of a series of benefits processing times for two groups of 56,000 claimants – those cleared under the Age 54\textsuperscript{+} project and those cleared under the old processing system. Descriptive statistics involving the mean benefits processing time, the minimum and maximum processing times and standard deviations were computed and compared for the two groups of benefits processing times. To visually ascertain the increasing or decreasing pattern of claim processing times under the two different scenarios, trend graphs were employed. Box plots were constructed to visually ascertain the normality or skewness of the distribution of the processing times of claimants under the Age 54\textsuperscript{+} project and those under the old processing system.

Furthermore, a statistical test of difference in samples to ascertain whether or not there is a significant difference between the benefits processing time of claimants cleared under the Age 54\textsuperscript{+} project and those under the old processing system was performed. The hypotheses of the study are indicated as follows:

$H_0$. There is no significant difference in the benefits processing time of claimants cleared under the Age 54\textsuperscript{+} project.

$H_1$. There is a significant difference in the benefits processing time of claimants cleared under the Age 54\textsuperscript{+} project.

7. Results

The Age 54\textsuperscript{+} project was implemented to reduce the processing time between claim lodgement date and claim payment date by correcting problems associated with both personal and financial data on contributors. That is to say, mistakes and omissions in respect of contributors’ personal and financial data are identified and fixed prior to the actual processing task when the contributor reaches the retirement age.

Descriptive analyses

The claims processed for claimants cleared under the Age 54\textsuperscript{+} project were 41,600, whereas those processed under the old processing system were 14,400 for the five-year period from 2009 to 2013. The moderate difference in data size between the Age 54\textsuperscript{+} and the old processing systems is largely explained by the goal of the new claim processing system – Age 54\textsuperscript{+}. There was an ambitious and aggressive goal to rapidly transform the claim processing system of the Trust by deploying the Age 54\textsuperscript{+} system. However, since the data sizes for both systems are relatively large, normality in the distribution of data is addressed and any potential biases or skewness significantly minimised. Table I presents some descriptive statistics of the processing time of claims for claimants cleared under the Age 54\textsuperscript{+} project and those cleared under the old processing system.

As seen from Table I, the Age 54\textsuperscript{+} project appears to have relatively reduced the amount of variations in the claim processing time (57 days) as compared to the processing time under the old system (73 days). Besides, the maximum possible time for processing a

<table>
<thead>
<tr>
<th>Claimant category</th>
<th>Min (days)</th>
<th>Mean (days)</th>
<th>SD (days)</th>
<th>Max (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cleared under Age 54\textsuperscript{+}</td>
<td>3</td>
<td>73</td>
<td>57</td>
<td>854</td>
</tr>
<tr>
<td>Old processing system</td>
<td>7</td>
<td>91</td>
<td>73</td>
<td>1,482</td>
</tr>
</tbody>
</table>
claim under the Age 54+ project is 854 days, which is an improvement of about 40 per cent over the old system of processing claims. Though there is an improvement, the maximum possible time for claim processing, under the Age 54+, is still relatively high and can be explained by the problem of weak data capture and management on citizens embedded in the systems of most developing countries, including Ghana. This problem creates difficulties for the Trust in knowing and retrieving financial and personal records of claimants who worked with different organisations during their working time. Again, lack of due diligence on the part of the Trust during the processing as well as slackness on the part of claimants in responding to requests for further information by the Trust partly explains the relatively high maximum processing time. Furthermore, as seen from Figure 5, the box plots of the processing times of claimants cleared under the Age 54+ project and those under the old processing system indicate right-skewed distribution for claimants under both scenarios. This suggests that in both cases, there are still some extremely high processing times, implying that there are large variations in the processing times. A component of lean operations is standardisation of processes. It appears that although other aspects of lean were effective and led to reduction in average processing time, standardisation within the Age 54+ has not been fully achieved. Although this then raises some concerns for the Trust as it seeks to reduce the claims processing times by using the Age 54+ project, it also represents an opportunity for additional improvements and studies.

Trend analyses
The implementation of the Age 54+ project has seen the reduction of the average processing times for claimants cleared under the project relative to those cleared under the old processing system. However, from 2009 to 2012, there appears to be a consistent rise in the average processing times for both claimants cleared under the Age 54+ project and those under the old processing system (Figure 6).

The consistent rise in the average processing times from 2009 to 2012 for both scenarios can be explained by the poor integration or synchronization of the new system (Age 54+ project) with the old processing system. After 2012, a problem analysis was performed at the Trust and the problem of lack of resources (staff and equipment) was identified. The Trust then decided to engage more resources and that saw a drop in the average processing times in 2013 for both groups of claimants.

Statistical test of difference in means of claim processing time
The test of difference (two-tailed test) between the average processing times between claimants cleared under the Age 54+ project and those under the old processing system is
significant at the 5 per cent significance level as shown in Table II. The two-tailed test, t-statistic, was computed as indicated in the following equation:

\[ t = \frac{\bar{x}_1 - \bar{x}_2}{SE}, \]

where \( \bar{x}_1 \) is the mean of processing time of claimants under Age 54+ project, \( \bar{x}_2 \) is the mean of processing time of claimants under the old processing system and SE is the standard error. The calculation of the SE took into account the unequal sample sizes of the two populations.

The hypotheses for the test in difference in means are indicated as follows:

- \( H_0: \mu_1 = \mu_2, \)
- \( H_1: \mu_1 \neq \mu_2, \)

where \( \mu_1 \) is the mean claim processing time for claimants cleared under the Age 54+ project and \( \mu_2 \) the mean claim processing time for claimants under the old processing system.

**Impact of Age 54+ project on claim processing time**

The delays in the claim processing at the Trust, over a long time, gave a bad impression and image about the Trust from the standpoint of claimants. Socially and economically,
claimants who have their benefits payment delayed as a result of the lengthy claim processing period become worse off economically. Such claimants, basically, have to rely on their little personal savings before retirement or fall on family members (including children) for upkeep before the payment of benefits by the Trust. However, with the introduction of the Age 54+ project, the claim processing time at the Trust was reduced for the same time period of 2009–2013. Generally, from 2009 to 2013, the average claim processing time under the Age 54+ project stands at 73 days compared to 91 days under the old processing system. This indicates a 20 per cent time savings under the Age 54+ project as compared to the old processing system. At the same time, it is worthy to note that prior to the implementation of the Age 54+, the average processing time was 120 days (Social Security and National Insurance Trust, 2001), thus, the 73 days processing time represents a reduction of 47 days (i.e. 39 per cent). This reduction in processing time is highly significant and can lead to an improvement in customer satisfaction. Also, the Age 54+ project appears to have contributed in improving on the performance of the old processing system by reducing the average processing time for that system from 120 to 91 days as of 2013, representing a 24 per cent reduction. This improvement in the average processing time under the old processing system can be explained by the absorption of pressure on the old claim processing system by the Age 54+ project. In other words, the efficiency of the Age 54+ project in a way eased the pressure on the available resources (labour, equipment, etc.) of the Trust and improved its capacity. This is a significant benefit in that often, process improvement assessments fail to recognise the synergistic benefits that accrue from improvement projects. Furthermore, the productivity of the Age 54+ project relative to the old processing system is reflected in the higher number of claims (41,600) cleared under it as compared to the claim (14,400) cleared under the old processing system for the same time period 2009–2013. Again, from Table II, the p-values for all the mean processing times for the years 2009–2013 are all less than 0.05. Hence, the test of difference in mean processing times is significant and H1 is supported. The observed data suggest a positive result of the project as claimants cleared under the Age 54+ project relatively have shorter claim processing time.

8. Discussion and conclusions
This study sought to ascertain, if the implementation of a process improvement project at a public sector organisation in a developing country led to efficiency and productivity gains and further to use the lean operations principles as a lens to decipher how and why the improvements occurred. The project had a single objective of having the data (personal and financial) of all contributors to the Trust – with age 54 years and above – cleansed before the retirement age of 60 years so as to reduce the overall claim processing time from the date of lodgement of claim to the payment date. This adjustment in the claims process is akin to the lean concept of converting internal setups into external setups (i.e. SMED) in order to reduce the overall process time. Also, the Trust not waiting until the age of retirement before processing of retirement benefits begins but flagging and signalling members who are aged 54 and above for prior processing indicates “a pull” instead of “a push” principle (i.e. kanban). This has the potential of eliminating waste and ensuring speed in claim processing. The cleansing of the data was aimed at eliminating or reducing data processing errors when people feel rushed to perform activities. The evidence of having completed the Age 54+ project process is a possession of a “blue card” which is required to be submitted to a benefit officer at the time of application for retirement benefits. With regard to lean concepts, the “blue card” represents a kanban system, in that it signals the readiness of the claims processing task to accept the new claim being presented. The Age 54+ project is a simple but effective way of responding to the excessive delays, which also represents waste according to lean principles, in benefits processing at the Trust. The project did not involve a drastic
change in the operation of the Trust with respect to claim processing. The philosophy which underpins the project is basically a “Let’s Start in Time” idea and “Let’s Reduce or Eliminate errors prior to the Start of the Claim”. This has, on the average, reduced the claim processing time at the Trust by 20 per cent compared to the old processing system as of 2013.

The savings of 20 per cent in the claim processing time by the Age 54+ project is a significant accomplishment. However, there exists more potential to consolidate the gains and to further ensure savings in the claim processing time. The success of ensuring further savings in the claim processing time would largely depend on improvements in data (personal and financial) capturing and management on citizens or employees which is usually a weakness embedded in developing countries’ systems. Again, such data capturing and management systems would be beneficial, if they are digital based. What could potentially help in further ensuring savings is an establishment of an online platform which mediates the interactions between claimants and the Trust on a co-processing principle. Obviously, the problem of illiterate and semi-literate contributors of the Trust poses a challenge. However, such as system has with it an advantage of demand management improvement by having the literate contributors as co-processors while the illiterate and semi-literate contributors are handled by the existing physical interaction system. Besides, collaboration between the Trust and human resource departments and managers of organisations who have members contributing to the Trust could further ensure more efficiency with the claim processing time. Such collaboration could manifest in the form of education on benefits processing by personnel of the Trust for human resource staffs as well as data and information sharing between the Trust and human resource departments of organisations.

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Impact of workplace bullying on employee outcomes: a study of Indian managerial employees

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Abstract

Purpose – The purpose of this paper is to examine the impact of workplace bullying on innovative work behavior and neglect with defensive silence as a mediator. The study further examines if the presence of friendship networks in the workplace can weaken the negative impact of workplace bullying.

Design/methodology/approach – Data were collected through self-report questionnaires from 835 full-time Indian managerial employees working in different Indian organizations.

Findings – Results revealed that workplace bullying negatively related to innovative work behavior and positively related to neglect. Defensive silence mediated bullying–outcomes relationships and effects of workplace bullying on proposed outcomes were weaker in the presence of high workplace friendship.

Research limitations/implications – A cross-sectional design and use of self-reported questionnaire data are few limitations of this study.

Originality/value – The study extended the current research stream of workplace bullying to one of the underrepresented developing Asian countries, India. The study also contributes in terms of its sample characteristics as it covers managerial employees working across different organizations.

Keywords Defensive silence, Neglect, Workplace bullying, Indian managers, Workplace friendship, Innovative workplace behaviour

Paper type Research paper

Introduction

While the focus on positive leadership dominates leadership research, a recent stream of research under the label of “supervisory behavior” has shown a growing interest in the “dark side” of leadership (Schyns and Schilling, 2013, p. 138). One form of destructive leadership behavior that is found to be widely prevalent in workplaces and has far-reaching impacts on employees and organizations is workplace bullying (Einarsen et al., 2007; Schyns and Schilling, 2013). Workplace bullying – a form of interpersonal mistreatment – is defined as a situation in which an employee feels constantly and persistently subjected to negative behaviors by others at work (Einarsen et al., 2011), mostly by someone at supervisory position (D’Cruz and Rayner, 2013; Lutgen-Sandvik et al., 2005). Workplace bullying is reported to occur on a regular basis in workplaces, with a prevalence estimated at 11–18 percent (Nielsen et al., 2010) and where as much as 80 percent of the cases involve a superior in the role as the alleged bully (Einarsen et al., 2003; Lutgen-Sandvik et al., 2007). A burgeoning amount of literature is available on outcomes of workplace bullying; bullying is related to a wide range of employee outcomes like high intention to quit, absenteeism, low organizational citizenship behavior, low task performance, job dissatisfaction, work disengagement, low organizational commitment, depression, post-traumatic stress and psychosomatic complaints) (Laschinger and Fida, 2014; Nielsen and Einarsen, 2012; Samnani and Singh, 2012). However, the literature examining the bullying–outcomes relationship has some gaps that require further research.

A major oversight of studies examining the bullying–outcomes relationship is that extant research has repeatedly focused on a restricted group of variables and has completely overlooked other important variables as outcomes of workplace bullying.
For instance, innovative work behavior is one important employee outcome that has not been examined in the context of workplace bullying. Engaging in discretionary behaviors like innovative work behaviors is amongst the most important employee contributions that is critical for determining organizational productivity and performance (Agarwal, 2014; Agarwal et al., 2012). Similarly, limited efforts have been directed toward examining the impact of workplace bullying on employee neglect despite its crippling effects on organizations worldwide in terms of lost productivity and performance (Bennett and Robinson, 2003). There is ample empirical evidence suggesting that leader’s behavior (interpersonal treatment) plays an important role in determining employees’ discretionary workplace behaviors (Podsakoff et al., 2000; Yidong and Xinxin, 2013) as well as deviant behavior (Gils et al., 2015; Mitchell and Ambrose, 2007); thus, it would be of interest to both researchers and practitioners to understand how bullying impacts employee innovative work behaviors and neglect. Building on the conservation of resources (COR) theory (Hobfoll, 2001), we argue that bullying triggers a resource loss process and as an attempt to conserve their resources, employees may lapse into low innovative work behaviors and high neglect.

Another major oversight of studies examining the bullying–outcomes relationship is that the majority of studies have investigated the direct relationships between bullying and its outcomes (Rai and Agarwal, 2016). Little is known about why workplace bullying has the impact that it does have and what factors are capable of mitigating the harmful effects of workplace bullying (Kakarika et al., 2017; Park and Ono, 2016; Rai and Agarwal, 2017a; Salin and Notelaers, 2017; Tuckey and Neall, 2014). One of the critical defining features of workplace bullying is power imbalance (Einarsen et al., 2011) which has been primarily conceptualized as being derived from the perpetrator’s organizational position (Aquino and Thau, 2009; Einarsen et al., 2011; Hoel and Cooper, 2001). Extant literature on destructive leadership behavior (e.g. abusive supervisor, workplace bullying, Cole et al., 2016) suggests that victims of mistreatment become silent because of the fear of negative repercussions associated with speaking up as most of such acts are perpetrated by someone in a supervisory position (Aquino et al., 2006; Milliken et al., 2003; Pinder and Harlos, 2001). Drawing on the COR theory, we argue that bullying fosters employee silence (defensive silence) and the inability to express their ideas/discontent can take a psychological toll on employees (Cortina and Magley, 2003; Perlow and Williams, 2003) draining their resources (Xu et al., 2015) and resulting in undesirable attitudes and behaviors (Dedahanov et al., 2016; Festinger, 1957; Morrison and Milliken, 2000; Whiteside and Barclay, 2013).

Research suggests that getting support from different sources can serve as a buffer for reducing the negative effects of workplace mistreatment (Duffy et al., 2002; Kim et al., 2015). Employees of an organization not only interact with their supervisors but also with their colleagues with whom they form friendship bonds. Workplace relationships, especially with coworkers (workplace friendship), constitute a major resource pool for employees (Chang et al., 2016; Chen et al., 2013; Halbesleben, 2006; Methot et al., 2016). In line with the “cross-domain buffer hypothesis” which suggests that support from one domain (e.g. workplace friendship-colleagues) may buffer the negative consequences of the mistreatment from another domain (e.g. workplace bullying-supervisors) (Duffy et al., 2002; Wu and Hu, 2009), this study aims to examine workplace friendship as a moderator of the bullying–outcomes relationship. Qualitative studies on victims of workplace bullying have also shown that friendships at work can alleviate the negative effects of bullying (D’Cruz and Noronha, 2011; Rai and Agarwal, 2017b). Figure 1 represents our hypothesized model.

The present study contributes to the extant literature in several ways. First, drawing insights from COR theory (Hobfoll, 2001), this study contributes to workplace bullying literature by examining workplace bullying as a barrier to employee innovative work behaviors and booster of employee neglect. Second, focusing on one of the crucial defining
feature of workplace bullying, i.e. power imbalance, this study examines defensive silence as an underlying mechanism in the bullying–outcomes relationship. Third, this study demonstrates the interrelationships between resources across contexts and investigates the mitigating role of workplace friendship in the bullying–outcomes relationship. This study also contributes in terms of its sample that focuses on managerial employees as well as its context as it extends a Western-centric literature to the Indian (Asian) context. Given that the managerial workforce plays a key role in the growth of an organization and makes important economic contributions to an organization (Quick et al., 2002; Nelson and Cooper, 2007), we believe that a study exploring the factors that negatively impact managers is much needed.

The study has been organized as follows. The next section presents the theoretical background and hypotheses development. The methodology and results sections present details about the study sample, the measures used in the study, the data analyses performed and the main findings. The final section discusses the implications for both theory and practice, the limitations of the research and the directions for future research.

**Theoretical background and hypotheses development**

The COR theory has been widely used to explain the outcomes of destructive leadership (Carlson et al., 2012; Harris et al., 2007; Lee and Brotheridge, 2006; Tuckey and Neall, 2014; Wheeler et al., 2010; Whitman et al., 2014; Xu et al., 2015). According to the COR theory, people have both an innate and a learned drive to obtain, retain and protect resources which come in the form of objects, personal characteristics, conditions and energies (Hobfoll, 1989; Hobfoll and Freedy, 1993). Central to the COR theory are two key tenets, which consist of resource conservation and resource acquisition (Ng and Feldman, 2012) and are based on the idea that resource losses are more salient than gains, and once resource loss occurs, individuals may struggle to conserve and protect their resource reservoirs (Hobfoll, 2001). According to the COR theory, workplace bullying triggers a resource loss process (Tuckey and Neall, 2014) and as an attempt to protect their resources, employees may take up defensive positions, i.e. they may withdraw themselves from any efforts that are resource consuming (Hobfoll, 1989, 2001; Kiazad et al., 2014; Wheeler et al., 2010) or may even use neglect strategies to protect resources (Byrne et al., 2014; Hobfoll, 1989, 2001; Penney et al., 2011). In the following sections, building on the COR theory, we explain the workplace bullying–outcomes (innovative work behavior and neglect) relationship. We then introduce defensive silence as a mediator and workplace friendship as a moderator.
Innovative work behavior is defined as the “intentional generation, promotion, and realization of new ideas within a work role, workgroup, or organization” (Janssen and Van Yperen, 2004, p. 370). Engaging in innovative work behaviors requires a conspicuous investment of cognitive, emotional, and physical resources (Montani et al., 2015; Scott and Bruce, 1994) and is therefore considered a resource taxing activity (Janssen, 2004). According to the COR theory, whenever there is a resource loss, engaging in activities that require an investment of resources would be difficult (Kiazad et al., 2014; Macey and Schneider, 2008; Scott and Bruce, 1994). Moreover, in a stressful workplace, much of an employee’s focus and time is invested in coping and managing stress, thereby further draining their existing resources and decreasing their propensity to display innovative work behaviors (Agarwal et al., 2016; Podsakoff et al., 2007). Thus, after facing workplace bullying, a reduction in innovative work behaviors may occur as a result of resource insufficiency (Hobfoll, 1989) and may be viewed as an employee’s intention to conserve resources by reducing their efforts (Rai and Agarwal, 2018). Innovative work behavior is a discretionary behavior (Janssen, 2000), and withdrawal of discretionary behaviors is considered one of the most immediate employee responses to protect resources in adverse workplace situations (Aryee et al., 2008; Podsakoff et al., 2000). Thus, we propose the hypothesis:

**H1a.** Workplace bullying correlates negatively with innovative work behavior.

Neglect refers to “passively allowing conditions to deteriorate through reduced interest or effort, chronic lateness or absences, using company time for personal business, or increased error rate” (Rusbult et al., 1988, p. 601). Neglect is regarded as a behavioral strain, i.e. a negative behavior performed in response to perceived workplace stressors (Jex and Beehr, 1991; Spector and Jex, 1998). In accordance with the COR theory, “strain outcomes are most likely to occur when resources are threatened or insufficient to meet demands” (Penney et al., 2011, p. 59). This is because depleted individuals lack physical, psychological and emotional resources to engage in self-regulation (Childers, 2014; Krischer et al., 2010). From the COR theory perspective, neglect may also be an outcome of a resource protecting process occurring in the phase of resource loss and performing neglect may be instrumental in helping an employee reduce the psychological strain associated with the resource loss (Krischer et al., 2010; Penney et al., 2011). For instance, taking long breaks (neglect) can be interpreted as actions aimed at conserving the resources by employees exposed to stress or may provide them with an opportunity for repletion of exhausted psychological resources (Halbesleben et al., 2014; Westman et al., 2004). The COR theory also suggests that being detached from one’s work (respite) in the phase of resource loss might prevent the further loss of resources (Westman et al., 2004). Recent empirical work has also found a positive relationship between workplace bullying and employee neglect (Devonish, 2013; Peng et al., 2016). Thus, we propose the hypothesis:

**H1b.** Workplace bullying correlates positively to neglect.

**Defensive silence as mediator**

Employee silence, defined as an employee intentionally withholding ideas, information, concerns and opinions about issues related to their job and the organization (Brinsfield, 2013; Dyne et al., 2003), is one of the most significant passive responses that employees display in the face of mistreatment at work (Xu et al., 2015). The extant literature on employee silence has repeatedly pointed to employees’ dysfunctional relationships with
their superiors as the primary cause for their decision to remain silent (Greenberg and Edwards, 2009; Morrison, 2014). Research suggests that victims of mistreatment rarely report or retaliate against the offender (supervisors in the majority of workplace bullying cases) as the offender is well positioned for counter-revenge and they are dependent on them for resources such as continued employment and advancement opportunities (Harvey et al., 2007; Tepper et al., 2007, 2009; Xu et al., 2015). A recent qualitative study by Rai and Agarwal (2017b) on victims of bullying has shown that that coping via silence is one of most prevalent forms of resistance in response to workplace bullying, and victims use silence strategically in order to avoid the negative consequences associated with speaking up (defensive silence; Kish-Gephart et al., 2009; Dyne et al., 2003).

Defensive silence is defined as the deliberate omission of voice on the basis of fear of the consequences associated with speaking (Brinsfield, 2013; Dyne et al., 2003; Pinder and Harlos, 2001). Studies have shown that a large number of employees are hesitant to speak up about problems at work (Milliken et al., 2003; Ryan and Oestreich, 1998); especially, victims of mistreatment become silent, when the perpetrator holds a higher status because of the fear of negative repercussions associated with speaking up (Aquino et al., 2006; Milliken et al., 2003; Pinder and Harlos, 2001). One of the crucial and distinguishing features of workplace bullying is power disparity, i.e. victims of workplace bullying may view themselves as powerless to raise their voice over the acts of mistreatment, thus may opt for defensive silence. The COR theory suggests that silence is a calculated and deliberate decision to regulate resources (Ng and Feldman, 2012). Remaining silent within one’s workplace is a natural and safe way to protect and conserve the remaining resources (Xu et al., 2015). From the COR theory perspective, speaking up per se is usually personally-costly, and risky, as it requires extra effort, time and energy and those who speak up are at the risk of potential resource loss (Bolino and Turnley, 2005; Xu et al., 2015). The extant interpersonal mistreatment literature suggests that those who speak up are at risk of being marked as troublemakers (Lutgen-Sandvik, 2003) and may lose desirable personal resources or professional opportunities (Harvey et al., 2007; Kiewitz et al., 2002; Milliken et al., 2003; Tepper et al., 2007; Xu et al., 2015).

However, the inability to express their view or discontent (silence) can take a psychological toll on the employees (Avery and Quiñones, 2002) generating feelings of humiliation, anger, stress and resentment (Cortina and Magley, 2003; Knoll and van Dick, 2013; Perlow and Williams, 2003). This psychological discomfort drains employees’ psychological resources and, as a way to conserve their remaining resources, they are likely to reduce innovative work behavior (Argyris and Schön, 1997) and are more likely to be involved in neglect (Bolton et al., 2012). Previous studies have also examined silence as a mediator between important organizational antecedents (justice, punishment and communication opportunities) and employee outcomes (emotional exhaustion, psychological withdrawal, physical withdrawal, performance and stress) (Dedahanov et al., 2016; Whiteside and Barclay, 2013). Thus, our hypothesis is:

\[ H2. \text{Defensive silence mediates the relationship between workplace bullying and outcomes (innovative work behavior and neglect)}. \]

Workplace friendship as moderator
Employees in organizations interact with each other resulting in friendship bonds. Workplace friendship is a unique workplace relationship that is voluntary, informal, has a personal bond and is for personal, socio-emotional benefits (Mao, 2006; Sias et al., 2004). The workplace friendship network provides employees with instrumental, emotional and social support to cope with adverse workplace situations (Chang et al., 2016; Chen et al., 2013; Hobfoll and Shirom, 2001; Sias, 2009). Research suggests that compared to persons with
poor support systems, persons who feel supported can cope more effectively with stressful situations (stress-buffering hypothesis; Sloan, 2012, p. 7).

Friendship/coworker support has been treated as a resource in the COR theory (Hobfoll, 1989). The COR theory suggests that availability of a resource in one distinct context can compensate for another resource that has been drained in a separate context (Hobfoll, 1989; Bordia et al., 2014). As one of the critical actors in the workplace, coworkers with whom employees share friendship bonds may provide psychological resources like emotional support to employees by listening to their problems, being friendly and showing concern and empathy for their difficulties (Chiaaburu and Harrison, 2008; Sloan, 2012). This emotional support is likely to be helpful in reducing the stress caused by negative supervisory treatment (Kim et al., 2015) and energize employees to restrain the depletion of their resources and offset their emotional withdrawal from work (Lakey and Cohen, 2000; Lam et al., 2010; Tyler and Burns, 2008; Van Emmerik et al., 2007). More specifically, the friendship network is considered a backstage resource that provides a mechanism to minimize distress (Lazarus and Folkman, 1984; Lazega and Pattison, 1999) by providing access to supportive interactions, which serve as outlets for individuals to disclose and manage emotions (Methot et al., 2016). These support interactions provide feelings of emotional energy and cognitive liveliness which reduce the exhaustion caused by negative workplace interactions (Hobfoll and Shirom, 2001; Methot et al., 2016) and contribute to a positive sense of self and increase individuals’ motivation to overcome the challenges (Hobfoll, 2002). Based on the cross-domain buffering perspective, previous studies have also revealed the moderating role of coworker support on the relationship between supervisory mistreatment and employee outcomes (Chiu et al., 2015; Duffy et al., 2002; Ilies et al., 2011; Hobman et al., 2009; Wu and Hu, 2009). Thus, we propose that:

H3. Workplace friendship moderates the workplace bullying and outcomes relationship such that the positive and negative relationships between workplace bullying and outcomes are weaker for employees with high workplace friendship than those with low workplace friendship.

Methodology
Sample
The study sample comprised 835 managerial employees working in different Indian organizations. The sample consisted of 81 percent males with a mean age of 32 years (SD = 8) and a mean organizational tenure of 8.7 years (SD = 7.7). The participants were employed in a diverse range of sectors including manufacturing, utility, aviation, retail and trade, information technology, telecommunications and consulting. In all, 30.8 percent of the respondents were from junior-level management, 60.2 percent of the respondents were from middle-level management and the others (9 percent) were senior management employees.

Study procedure
Based on the classification of organizations on job portals (naukri.com, indeed, iimjobs.com), around 50 organizations located in and around India’s three major cities – Mumbai, Bangalore and Pune – were invited to participate. These cities were chosen to facilitate repeated visits for data collection and the follow-up survey. An e-mail containing the study objectives and data collection procedures was sent to HR departments of the selected organizations. A total of 11 organizations agreed to survey their employees. The organizations involved were: two automobile manufacturing companies (Mumbai, Pune); two electricity utility companies (Mumbai, Pune); one gear manufacturing company (Pune); one tire manufacturing company (Mumbai); one civil aviation company (Mumbai); one online fashion retail company (Bangalore); one telecommunications company (Mumbai); one
retail and fashion company (Bangalore); and one information technology company (Bangalore). The human resources departments of the 11 organizations assisted the researchers for data collection. To ensure a balanced representation of the employees from different organizational departments and job positions, a stratified random sample of 1,300 managers representing different organizational departments and job positions within the selected organizations were sent an invitation by the HR teams of their respective organizations to volunteer for the study; 950 volunteered to participate.

Data were collected in two stages (with the antecedents separated from the outcomes), two weeks apart, in order to reduce the common method variance problems associated with single-source and one-time data collection (Podsakoff et al., 2003). In the first stage, a questionnaire – containing demographic details and the independent variable (workplace bullying) – was administered to the employees during working hours. During the initial contact with the participants, the objectives, voluntary nature of the study and confidentiality of the data were explained. Data on the dependent variables, mediator and moderator (innovative work behavior, neglect, defensive silence and workplace friendship) were collected through a second survey instrument (Stage 2) that was administered to the participants 14 days later. This gap of 14 days between two stages of data collection was decided on the basis of convenience for the organizations. Every questionnaire was marked with a unique code which was recorded in a master file such that the responses received from the two phases can be matched. The use of the codes allowed us to exclude participants’ names, ensuring the confidential nature of the survey.

Out of the 950 employees who volunteered to participate, 930 were available during the first stage of the survey. The number of participants further dropped to 870 in the second stage of the survey. In total, 35 questionnaires were discarded because of missing or inappropriate data, leaving a total of 835 completed and usable cases (response rate = 64 percent).

Measures
All measures used in this survey were adopted from the established scales written in English. The specific measures used in the study are described below.

**Workplace bullying.** Workplace bullying was measured using 22-items Negative Acts Questionnaire-Revised (NAQ-R) developed by Einarsen et al. (2009). The NAQ-R consists of three types of bullying behaviors: person-related (e.g. being humiliated or ridiculed in connection with your work), work-related (e.g. being given tasks with unreasonable deadlines) and physically intimidating (e.g. being shouted at or being the target of spontaneous anger) bullying behaviors. Response categories were coded from 1 to 5 with the alternatives “never,” “now and then,” “monthly,” “weekly” and “daily.” The three dimensions of workplace bullying were combined additively to create an overall workplace bullying scale. The α reliability of the scale was 0.97. The psychometric properties of NAQ-R has been validated in the Indian context (Rai and Agarwal, 2017c).

**Innovative work behavior.** Innovative work behavior was measured using a nine-item scale developed by Janssen (2001). This scale consists of three dimensions, each with three items: idea generation (e.g. creating new ideas for difficult issues), idea promotion (e.g. mobilizing support for innovative ideas) and idea realization (e.g. transforming innovative ideas into useful applications). All items were measured on a seven-point scale ranging from never (1) to always (7). The three dimensions of innovative work behavior were combined additively to create a composite scale. The α reliability of the scale was 0.87.

**Neglect.** Neglect was measured with a four-item scale developed by Rusbult et al. (1988). Scale items were anchored on a five-point scale, ranging from 1 (strongly disagree) to 5 (strongly agree). A sample item is “now and then there are work days where I just don’t put much effort into my work.” The α reliability of the scale was 0.87.
Defensive silence. Defensive silence was measured with five-item designed to measure defensive silence from Brinsfield (2013) employee silence scale. Scale items were anchored on a five-point scale, ranging from 1 (strongly disagree) to 5 (strongly agree). A sample item is “I feel it is dangerous to speak up.” The $\alpha$ reliability of the scale was 0.90.

Workplace friendship. Workplace friendship was measured with a six-item scale developed by Nielsen et al. (2000). Scale items were anchored on a five-point scale, ranging from 1 (strongly disagree) to 5 (strongly agree). A sample item is “I have formed a strong friendship at organization.” The $\alpha$ reliability of the scale was 0.80.

Control variables
One-way ANOVA was performed to examine differences in ratings across the 11 organizations. The results showed that $F$-values were significant for nearly all the variables. Mean differences were expected as the 11 organizations differed in their business processes and challenges. Post hoc analyses based on Scheffe’s test were conducted to test whether pairs of mean differences among variables formed a pattern. The results did not yield a pattern that could be used for clustering organizations for further analyses.

Three demographic variables, i.e. age, gender and tenure, were used as controls to rule out alternative explanations for the findings since they are related to the perception of workplace bullying (Francioni et al., 2015; Lee et al., 2013; Notelaers et al., 2011). Age was measured as a continuous variable. Gender was modeled as a categorical variable. Employee job tenure was measured as years of service and was modeled as a continuous variable.

Preliminary analysis
Common method variance. Harman’s single-factor test was utilized to investigate potential common method variance among the study variables (Podsakoff et al., 2003). The basic assumption of Harman’s single-factor test is that if a substantial amount of common method variance is present, one general factor will account for the majority (> 50 percent) of the covariance among the variables. The results of this test showed that multiple factors were extracted and the first factor accounted for only 28 percent of the total variance. Since no dominant general factor was found in factor analysis, the concern for common method variance could be partially mitigated.

We also conducted a series of confirmatory factor analyses to examine the distinctiveness of our study constructs. The proposed five-factor model (workplace bullying, innovative work behavior, neglect, defensive silence and workplace friendship) had a good model fit ($\chi^2 = 2,100$, $df = 784$, $\chi^2/df = 2.6$, goodness-of-fit index = 0.88, adjusted goodness-of-fit index = 0.84, comparative fit index = 0.94, root mean square error of approximation = 0.04). We further examined five alternative models and compared them with the five-factor model. As shown in Table I, the five-factor model fits our data better than alternative models, suggesting that our respondents could distinguish the focal constructs clearly.

Results
Descriptive statistics
Table II presents the descriptive statistics and intercorrelations between study variables. The zero-order correlations were all in the expected direction, indicating preliminary support for the hypothesized relationships.

Testing direct and mediated effects. The SPSS macro, PROCESS (Hayes, 2013; Preacher and Hayes, 2008), was used for path analysis. Workplace bullying was negatively related to innovative work behavior ($\beta = -0.16$, $t = -4.5$, $p = < 0.001$) and positively related to neglect ($\beta = 0.51$, $t = 14.46$, $p = < 0.001$) supporting $H1a$ and $H1b$, respectively. Workplace bullying
was significantly related to defensive silence ($\beta = 0.43$, $t = 10.14$, $p = < 0.001$), and defensive silence was significantly related to innovative work behavior ($\beta = -0.07$, $t = -2.3$, $p < 0.001$) and neglect ($\beta = 0.22$, $t = 7.9$, $p < 0.001$) when controlling for workplace bullying. The significant indirect effects supported the mediating role of defensive silence in the bullying-outcome relationships ($H2$). Additionally, after controlling for the mediator, the association between workplace bullying and outcomes remained significant with a drop-in $\beta$ values – innovative work behavior ($\beta = -0.12$, $t = -3.5$, $p < 0.001$) and neglect ($\beta = 0.41$, $t = 11.50$, $p < 0.001$) – suggesting partial mediating effects of defensive silence in workplace bullying-outcomes relationships. The direct and mediated effects are reported in Table III and Figure 2.
To further test the significance of indirect effect, we applied the Sobel (1982) test for indirect effects (MacKinnon et al., 2002) and a bias-corrected bootstrapped test with 5,000 replications to construct a confidence interval (Preacher and Hayes, 2008). The p-value of less than 0.05 confirmed that defensive silence plays a mediating role in workplace bullying–innovative work behavior (z = −3.5, p < 0.001) and workplace bullying–neglect (z = 6.3, p < 0.001) relationships. Bootstrapping corroborated these findings as bootstrapped confidence intervals around the indirect effect did not contain zero for

### Table III.
Regression results for direct and mediated effects

<table>
<thead>
<tr>
<th>Variables</th>
<th>$B$</th>
<th>SE</th>
<th>$t$</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Innovative work behavior regressed on workplace bullying</td>
<td>−0.16</td>
<td>0.036</td>
<td>−4.5</td>
<td>0.000</td>
</tr>
<tr>
<td>Neglect regressed on workplace bullying</td>
<td>0.51</td>
<td>0.035</td>
<td>14.46</td>
<td>0.000</td>
</tr>
<tr>
<td>Defensive silence regressed on workplace bullying</td>
<td>0.43</td>
<td>0.042</td>
<td>10.14</td>
<td>0.000</td>
</tr>
<tr>
<td>Innovative work behavior regressed on defensive silence after controlling for workplace bullying</td>
<td>−0.10</td>
<td>0.029</td>
<td>−2.6</td>
<td>0.000</td>
</tr>
<tr>
<td>Neglect regressed on defensive silence after controlling for workplace bullying</td>
<td>0.22</td>
<td>0.027</td>
<td>7.9</td>
<td>0.000</td>
</tr>
</tbody>
</table>

### Bootstrap results for indirect effect

<table>
<thead>
<tr>
<th>Indirect effects of workplace bullying on innovative work behavior</th>
<th>Value</th>
<th>SE</th>
<th>z</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Innovative work behavior regressed on workplace bullying</td>
<td>−0.045</td>
<td>0.013</td>
<td>−3.5</td>
<td>0.0004</td>
</tr>
<tr>
<td>Indirect effects of workplace bullying on neglect</td>
<td>0.094</td>
<td>0.015</td>
<td>6.3</td>
<td>0.000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Indirect effects of workplace bullying on innovative work behavior</th>
<th>Value</th>
<th>SE</th>
<th>CI</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Innovative work behavior regressed on workplace bullying</td>
<td>−0.045</td>
<td>0.013</td>
<td>−0.072</td>
<td>−0.019</td>
</tr>
<tr>
<td>Indirect effects of workplace bullying on neglect</td>
<td>0.094</td>
<td>0.015</td>
<td>0.068</td>
<td>0.125</td>
</tr>
</tbody>
</table>

**Notes:** $n = 835$. LL, lower limit; UL, upper limit; CI, confidence interval; $p$, level of significance. Bootstrap sample size = 5,000
bullying-innovative work behavior (−0.045 (−0.072; −0.019)) and bullying-neglect (0.094 (0.068; 0.12)) relationships. Taken together, these results support the mediating role of defensive silence in workplace bullying-outcomes (innovative work behavior and neglect) relationships. The Sobel test and bootstrapping results are reported in Table III.

Testing moderation (direct effect moderation model). We followed the procedure recommended by Aiken and West (1991) for performing moderation (hierarchical moderated regression analysis). The independent variables were mean centered prior to the creation of the interaction terms. Age, gender and tenure were used as control variables. In each regression analysis age, gender and tenure were entered as a control variable in Step 1, followed by the main effects (independent variable and moderator) in Step 2, and the interaction term (independent variable × moderator) in Step 3. The moderating effect is supported if the β coefficient of the interaction term is significant. The β coefficient of the interaction term between workplace bullying and workplace friendship was significant for both innovative work behavior (β = 0.07, p < 0.05) and neglect (β = −0.10, p < 0.05), thus supporting the moderating role of workplace friendship in bullying-outcomes relationships (H3). The regression results for testing moderation are reported in Table IV and the moderation graphs are presented as Figure 3. Figure 3 shows that the slopes of the relationships between bullying and outcomes (innovative work behavior and neglect) were shallow for employees with high workplace friendship, suggesting the mitigating role of workplace friendship in the bullying-outcomes relationship.

Discussion
The purpose of the present study was to examine the workplace bullying and outcomes (innovative work behavior and neglect) relationship with defensive silence as a mediator and workplace friendship as a moderator. As predicted, a negative relationship was found between workplace bullying and innovative work behavior, and a positive relationship was found between workplace bullying and neglect. Though this is the first study linking workplace bullying and innovative work behavior, previous studies suggest that workplace bullying is negatively related to employee discretionary workplace behaviors (work engagement, organizational citizenship behavior; Einarsen et al., 2016; Park and Ono, 2016; Rodríguez-Muñoz et al., 2009). Extant literature on interpersonal mistreatment constructs like abusive supervision, incivility has also shown that supervisory mistreatment at work is a potential deterrent of employees’ discretionary workplace behaviors (Aryee et al., 2008; Rodriguez-Muñoz et al., 2009).

### Table IV. Moderating effects of workplace friendship on the relationship between workplace bullying and outcomes

<table>
<thead>
<tr>
<th></th>
<th>Innovative work behavior</th>
<th>Neglect</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Step 1</td>
<td>Step 2</td>
</tr>
<tr>
<td><strong>Control variables</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>0.010</td>
<td>0.011</td>
</tr>
<tr>
<td>Gender</td>
<td>0.21*</td>
<td>0.21*</td>
</tr>
<tr>
<td>Tenure</td>
<td>0.01</td>
<td>0.01</td>
</tr>
<tr>
<td><strong>Independent variables</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Workplace bullying</td>
<td>−0.12***</td>
<td>−0.13***</td>
</tr>
<tr>
<td>Workplace friendship</td>
<td>0.20***</td>
<td>0.20***</td>
</tr>
<tr>
<td><strong>Interaction terms</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Workplace bullying × workplace friendship</td>
<td>0.07*</td>
<td>−0.10*</td>
</tr>
<tr>
<td>Adjusted $R^2$</td>
<td>0.083</td>
<td>0.088</td>
</tr>
<tr>
<td>$Δ$ Adjusted $R^2$</td>
<td>0.083</td>
<td>0.05</td>
</tr>
<tr>
<td>$F$</td>
<td>16.11***</td>
<td>14.34***</td>
</tr>
</tbody>
</table>

**Notes:** $n = 835$. *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$
Liu et al., 2012; Liu and Wang, 2013; Zellars et al., 2002). However, compared to other discretionary behaviors, innovative work behavior is regarded as risky and costly (Janssen 2000; Agarwal 2017) and is much directly related to overall organizational innovativeness and retention of sustained competitive advantage (Agarwal et al., 2012). Hence, both academicians and practitioners need to expend more efforts to understand how workplace bullying or any other form of mistreatment impacts employees’ innovative work behaviors. Neglect involves behavior (like reduced efforts, chronic lateness, long breaks) that are likely to go undetected or if detected are less likely to be punished, thus most of the employees in response to negative treatment at workplace are likely to involve into neglect (Tepper et al., 2009) resulting in increase in the frequency of such detrimental workplace behaviors (Lian et al., 2012; Needleman, 2008). Surveys and academic reports from Western organizations have shown that workplace deviance is both common and an expensive problem for organizations (Bennett and Robinson, 2000) as 33–75 percent of all employees have been found engaged in deviant behaviors (Bennett and Robinson, 2003; Harper, 1990) and 20 percent of businesses fail due to employee neglect (Coffin, 2003). Therefore, an examination of factors promoting employee neglect is crucial (Bennett and Robinson, 2003). Indian culture and values inculcate its citizens with morality and ethics, yet, surprisingly, Indian employees are not immune from such unethical behavior (Sharma and Paluchova, 2014). The results of the study supported the proposed hypothesis that workplace bullying correlates positively with employee neglect and as much as 45 percent of employees were involved in neglect in response to workplace bullying.

Understanding the factors that contribute to employee silence has become an important issue in organization management, given its detrimental impacts on organizations and employees (Morrison, 2014; Morrison, 2011). Moreover, withholding critical information also hinders the organization’s ability to timely identify the problems and correct them to prevent further damage (Milliken and Morrison, 2003; Morrison and Milliken, 2000; Tangirala and Ramanujam, 2008). Silence is one of the most important passive coping strategies of employees in response to mistreatment at work (Kiewitz et al., 2016; Whitman et al., 2014; Xu et al., 2015). We proposed that bullying fosters employee silence which, in turn, affects outcomes. The results of the study supported the mediating role of defensive silence in workplace bullying–outcomes relationships. More specifically, we found that defensive silence partially mediated bullying–outcomes relationships and this partial mediation suggests that there are some other underlying mechanisms in the bullying–outcomes relationship.

Figure 3. Moderating effects of workplace friendship

Notes: (a) Moderating effect of workplace friendship on workplace bullying–innovative work behavior relationship; (b) moderating effect of workplace friendship on the workplace bullying–neglect relationship
Several articles published in Forbes (2010), Habelow (2010), HBR (2013), Riordan (2013), Fast Company (2015) and Michelle Gibbings (2016) have highlighted the importance of workplace friendship. These articles reflect that friends at work form a strong social support network for each other and employees who report having friends at work have higher levels of productivity and job satisfaction. We also proposed that employees having strong friendship networks are less likely to be negatively impacted by workplace bullying. Results revealed that workplace friendship attenuated the effects of workplace bullying on outcomes such that positive and negative effects of workplace bullying on outcomes were weaker for employees with high workplace friendship.

**Theoretical contributions**

This study makes important theoretical contributions to different bodies of knowledge: workplace bullying, silence, innovative work behavior and workplace friendship. First of all, we contribute to growing research on workplace bullying by extending its range of outcomes by examining innovative work behavior and neglect as employees’ responses to workplace bullying. Most notably, our study advances insights based on the COR theory for understanding responses to workplace bullying. The COR theory provided valuable insights for exploring the context under which employees may decide to engage in innovative work behavior or neglect after facing workplace bullying.

In response to the limited underlying and intervening mechanisms, another important contribution of the present study is that we have proposed and examined a new mediator (defensive silence) and moderator (workplace friendship) in the bullying–outcomes relationships. This study is one of the few attempts to examine employee silence as a mediator between negative workplace situations and employee outcomes. This study also contributes to the emerging but limited literature on the precursors of silence (Morrison, 2014). Based on this study, we suggest that workplace bullying (or any other mistreatment in the workplace) fosters silence and can be treated as an antecedent to silence. The present study also makes an important contribution to the extant literature by simultaneously taking the negative (workplace bullying) and positive (workplace friendship) workplace relationships into account and examining their interactive impact on employees’ outcomes from a resource perspective (Labianca and Brass, 2006; Venkataramani et al., 2013). These findings also advance the social ledger model (Labianca and Brass, 2006) which suggests that employees within an organization engage in both positive and negative ties/relationships with other organizational members and both types of ties are inextricably linked to each other and need to be considered together in determining the employee outcomes (Venkataramani et al., 2013).

This study also contributes in terms of its sample composition and sample size. We conducted a survey of 835 managers in 11 Indian organizations. The dynamics of workplace bullying have not been thoroughly examined before among employees in managerial positions (Salin, 2005) despite the fact that studies have reported that managers are more likely to be victims of bullying owing to their typical work characteristics (Hoel and Cooper, 2000; Leymann, 1992). The high pressures and high internal competition may increase stress and frustration and lower the threshold for aggression among managers (Hoel and Cooper, 2000; Salin, 2001). Studying bullying in this neglected group of employees would surely widen the scope of bullying research.

Finally, this study contributes by exploring the effects of workplace bullying in a new context – India. Indian socio-cultural fabric, which is characterized as high on power distance and collectivism (Hofstede, 1980), provides strong support for examining the mediating role of silence and the moderating role of workplace friendship in the workplace bullying–work outcomes relationship. Research suggests that cultures create environments where silence can occur (Bowen and Blackmon, 2003; Huang et al., 2005; Verhezen, 2010).
Employee silence, especially defensive silence, can be an expected part of employee behavior in Indian organizations due to high power distance (insecurity or fear) (Jain, 2015). Employees in high power-distance cultures like India are less inclined to challenge superiors’ inappropriate attitudes through speaking up (Goodwin and Goodwin, 1999), as in such cultures, speaking up can be understood as challenging the status of the manager (Porter et al., 2003) and disobeying the norms of the organization (Goodwin and Goodwin, 1999). Coping via social support is especially common among collectivistic employees as they place emphasis on interconnectedness with their social group (Sinha et al., 2000) and are more likely to express and experience other-focused emotions such as sympathy (Markus and Kitayama, 1991). For such employees, the mere perception of having socially supportive networks can be stress reducing, even when the social support network is not explicitly mobilized for dealing with stress (Thoits, 1995).

Managerial implications

There is overwhelming support for the notion that negative work experiences not only have deleterious effects on employee behavior (Baumeister et al., 2001; Einarsen et al., 2007) but, more importantly, the intensity of implications of negative events on work behavior is far more intense than the effects of positive work events (Baumeister et al., 2001; Labianca and Brass, 2006; Eby et al., 2010). Therefore, understanding and preventing negative interactions in the workplace may be as important, or even more important, than understanding and enhancing positive interactions at the workplace. Organizations are responsible for providing a safe work environment for employees (Einarsen et al., 2003). Management should be aware of the detrimental effects of workplace bullying on employees and how to intervene the bullying situations (Salin, 2003). Given the negative impact of workplace bullying on employees behaviors, it is important to develop and promote approaches to prevention and intervention of bullying (Lutgen-Sandvik and Sypher, 2009). Organizations need to create a zero-tolerance culture toward workplace bullying behaviors and provide bullying-prevention training for managers. Policies such as “zero-tolerance bullying policy at work” and “managing with respect” should be formed, strengthened and well communicated to all the employees in the organizations. These policies should provide clear expectations regarding workplace interactions and a clear channel for reporting bullying. Organizations should provide training for all employees in respectful communication protocols and the consequences of not adhering to them. Management should timely monitor supervisor–subordinate interactions as supervisors’ inappropriate work behaviors can serve as a model for lower-level subordinates through a trickle-down effect (Ambrose et al., 2013; Hon and Lu, 2016).

Considering that employees may be reluctant to openly report bullying incidences, anonymous reporting solutions like hotlines and mobile applications such as STOPit should be established. Organizations can also establish an organizational ombudsman system that functions outside the traditional hierarchy to provide a mechanism for employees to share work-related problems (Milliken et al., 2003). By establishing such a system, employees’ confidentiality can be protected (Milliken et al., 2003), and individuals will not be concerned about creating tension and harming relationships between their superiors and themselves (Dedahanov et al., 2016). Formal and informal discussion with the staff should be promoted, and timely monitoring and employee’s surveys on appropriate/acceptable workplace behaviors should be conducted (Mathieson et al., 2006). Management support may encourage employees to combat bullying by refusing to accept it and by raising their voices against it (Salin, 2008).

Results suggest that employees subjected to workplace bullying are less likely to reduce their innovative work behavior and increase neglect if they are obtaining support from their friends at the workplace. Managers should provide ample opportunities for employees to interact with each other and develop strong interpersonal and informal networks (Duffy and Sperry, 2012) as these networks, in turn, would provide them with necessary resources to
cope with workplace bullying and other adverse workplace situations. Organizations may be benefited by conducting training programs for employees that can enhance their abilities to deal with stressors or negative emotional experiences (Diefendorff et al., 2005). Such employees may be better able to handle organizational adversities without being severely affected by them.

Limitations and future research directions
Although the results of this research supported the hypothesized relationships, there are some limitations that need to be acknowledged. First, we have used a cross-sectional design which does not allow inferences to be drawn about the causal relationships between bullying and its direct and indirect outcomes. Second, all constructs were measured with self-report questionnaires from a single source. Although we collected data in two stages with antecedents separated from outcomes that limited the possibility of common method variance; however, we cannot rule out this possibility. Third, our sample comprised mostly male respondents (81 percent). In the light of the gender differences in experiences of workplace bullying (Salin, 2003), a more gender-balanced sample may yield different results. Future research could employ a longitudinal analysis in order to make the causal relationships examined here more robust. From a cross-cultural perspective, a major limitation of the study is that the present study has been conducted with Indian employees; thus, generalizability of results to Western nations may become an issue. Similar studies should be carried out in contexts similar (Asian nations) and different than India (Western nations) to enhance the generalizability of these findings.

References


Further reading


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Forced distribution systems and attracting top talent

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Abstract
Purpose – The purpose of this paper is to test how an individual’s attractiveness to three types of appraisal systems relates to self-rated psychological entitlement and ethics; and constructs rated by others of: conscientiousness, extraversion and agreeableness.
Design/methodology/approach – A sample of 148 students in graduate-level business courses and matching close friends/significant others were surveyed. Data were analyzed using hierarchical regression and path analysis.
Findings – Path analysis indicated acceptable fit for the overall model of attractiveness to three appraisal types.
Practical implications – Advocates of forced distribution ranking systems (FDRS) suggest that such systems stimulate a high-talent culture and that achievers and strong performers are attracted to FDRS. In contrast, the findings suggest that FDRS are attractive to individuals with high levels of psychological entitlement and low levels of conscientiousness.
Originality/value – Advocates of FDRS and prior research have indicated that such systems reduce leniency bias and stimulate a high-performance and high-talent culture in which honesty is expected and poor performance is not tolerated. Others have found that high achievers and high performers are likely to find such systems attractive. The present study suggests that one downside of FDRS is its attractiveness to workers with low levels of conscientiousness and higher levels of psychological entitlement, which are two personality traits associated with lower levels of performance and a variety of negative outcomes.

Keywords Performance management, Ethics, Conscientiousness, Performance appraisal, Agreeableness, Talent management, Entitlement, Extraversion, Five factor model of personality, Forced distribution ranking systems, Subordinate influence ethics

Paper type Research paper

1. Introduction
Attracting top talent in organizations is an important component of human resource selection practices and overall organizational success (Chapman et al., 2005). Managing, developing and retaining top talent is additionally important, as talent management is a critical business strategy for achieving a competitive distinction. Chapman et al. (2005) conducted a meta-analytic study of the factors impacting the attractiveness of organizations and found that a variety of job and organizational characteristics were relevant. Often-cited characteristics include pay level, advancement opportunities and benefits (Del Vecchio et al., 2007). Less cited characteristics include performance appraisal systems (cf. Chapman et al., 2005), despite being one of the most important human resource practices (Boswell and Boudreau, 2002). Additionally, employee perceptions of performance appraisal systems are related to critical outcomes, such as job satisfaction, commitment and turnover intentions (Cawley et al., 1998; Kuvaas, 2006), so understanding these perceptions is important.

Attraction to performance appraisal systems varies between individuals as a function of their personalities and cognitive abilities (Blume et al., 2013), which can be explained under the framework of person-organization fit. Person-environment fit refers to the “compatibility between an individual and a work environment that occurs when their characteristics are well-matched” (Kristof-Brown et al., 2005, p. 281). Under this framework, strong fit is
achieved when individual and organizational characteristics and practices are congruent (Kristof, 1996; Blume et al., 2013).

Blume and colleagues (2013) distinguished three types of performance appraisal systems: a forced distribution rating system (FDRS) in which employees are evaluated relative to one another, a standards-based system in which employees are evaluated on a scale against pre-determined standards of performance and a group-based system in which employees are evaluated by the performance of their work unit. The authors found that high cognitive ability individuals were significantly, positively attracted to organizations using an FDRS and significantly, negatively to one using a group-based system. Alternately, collectivism and core self-evaluations corresponded positively to the attractiveness of organizations using a standards-based system. Core self-evaluations are fundamental evaluations that individuals make about themselves and their functioning within their environment (Judge et al., 2003). Collectivism also corresponded positively with perceptions of the attractiveness of a group-based system. Noting that individuals of high cognitive ability are attracted to FDRS as Blume et al. (2013) found, the authors provided support for using such systems. Yet of the three types, FDRS have been the most controversial.

FDRS are often used by organizations as a means of eliminating leniency bias in performance evaluations by forcing managers to rank employees relative to one another (Blume et al., 2013; Boehle, 2008). FDRS can be defined as a “performance-based evaluation system in which employees are ranked against each other based on a particular scheme or design” (Osborne and McCann, 2004, p. 6). FDRS further provide a transparent way of letting employees know where they stand relative to their coworkers (Ramanathan, 2015).

As an example of an FDRS, Jack Welch implemented a 20/70/10 “vitality curve” decades ago at General Electric (Welch and Byrne, 2001) as a means of identifying the “top 20%” of employees for an A ranking, a “vital 70%” of employees for a B ranking and the “bottom 10%” of employees for a C ranking. Two consecutive “C” evaluations often resulted in terminations (Welch and Byrne, 2001), while those in the top 2 groups received significant (A) or solid (B) raise differentials. Under Jack Welch’s reign from 1981 to 2001, General Electric’s value increased by $300bn (Nisen, 2015). Perhaps, such success led to the popularity and adoption of FDRS by other firms, such as Microsoft, Cisco, Intel and Goldman Sachs (Guralnik et al., 2004). FDRS have been termed “rank and yank” systems, yet Jack Welch prefers the less pejorative term of “differentiation” (Welch, 2013).

Despite support by some practitioners, not everyone considers FDRS beneficial to organizations. In recent years, a handful of Fortune 500 organizations has eliminated the FDRS, including General Electric (Nisen, 2015), Amazon (Sahadi, 2015), HCL Technologies, Microsoft (Ramanathan, 2015), Adobe, among others (Ramirez, 2013). Some consider the systems to be dysfunctional, hazardous to an organization’s health and detrimental to an organization’s culture (e.g. Pfeffer and Sutton, 2000; Pfeffer, 2001). Once the “poor performers” have been eliminated using FDRS, stronger performers may shift into the C category, generating animosity toward the system and dysfunctional competition between coworkers.

FDRS may further be challenged due to fairness perceptions. Buckingham and Goodall (2015) noted that FDRS may be subject to idiosyncratic rater effects, speaking more to an evaluator’s characteristics than to the target employees. Schleicher et al. (2009) examined FDRS from the raters’ perspective, finding that raters considered FDRS to be more difficult and less fair than traditional performance appraisal formats, such as an absolute, standards-based system. Roch et al. (2007) examined FDRS from the raters’ perspective, also finding that such systems are perceived as less fair than their absolute standards-based counterparts. Their sample included a mix of MBA, undergraduate business, graduate psychology and undergraduate psychology students.

Despite claims that FDRS generate unhealthy competition, lead to contaminated rankings due to rater biases and may be ineffective in assessing the performance of
talent-rich, knowledge-driven workforces, 21 percent of Fortune 500 and mid-size firms continue to use FDRS (Sahadi, 2015). Strong performance increases at General Electric (Nisen, 2015) and the attraction of such systems to people of high cognitive abilities (Blume et al., 2013), however, may contribute to the justification for such systems. Blume and colleagues (2013) posited that those with high cognitive ability would expect to perform well under such systems and may be inclined to favor organizations rewarding high achievement.

Cognitive ability is not the only factor relevant within the workplace that is likely to predict one’s inclination to favor one appraisal system over another. Other relevant personality and attitudinal characteristics may also relate to preferences for other types of performance appraisal systems. Accordingly, the present study offers further insight on the individual-level characteristics that correspond to perceptions of the attractiveness of three performance appraisal systems (cf. Staw, 1986; Roch et al., 2007; Blume et al., 2013). Specifically, we examine whether self-perceptions of psychological entitlement, others’ perceptions of conscientiousness, extraversion and agreeableness, and self-perceptions of subordinates’ upward influence pro-organizational and self-serving tactics correspond to preferences for these three types of performance appraisal systems.

We chose to focus on psychological entitlement due to its prevalence in the Millenial workplace and relationship to a variety of negative interpersonal behaviors (Campbell et al., 2004). We chose conscientiousness, extraversion and agreeableness due to their relationships to job performance (Barrick and Mount, 1991), status-striving (cf. Barrick et al., 2002, 2013) and working cooperatively, respectively (LePine and Van Dyne, 2001). These personality traits have also been distinguished by the motivational tendencies of getting along and getting ahead (Hogan and Holland, 2003). We chose self-serving and pro-organizational upward influence tactics due to both a lack of research on upward influence tactics and their correspondence to ethics and the “ugly underbelly of behavior in organizations” (Ralston and Pearson, 2010, p. 150.). We further chose those two variables because they most closely corresponded to getting along (pro-organizational upward influence tactics) and getting ahead (self-serving behaviors).

Our study has relevance to organizations seeking to become employers of choice, by attracting, managing, developing and retaining top performers with personality and attitudinal characteristics likely to shore up the strategic objectives of the firm. By identifying performance appraisal systems likely to attract such individuals, organizations can better align themselves among their competitors in the hunt for talent. As noted in a meta-analysis of 66 studies, managers need to invest in programs to increase and retain human capital, as superior human capital generate better firm-level performance (Crook et al., 2011).

In the next section, we examine the extant literature on performance appraisal systems and the aforementioned personality and ethics variables. We integrate the social exchange aspect of equity theory to hypothesize relationships between individual characteristics and attractiveness perceptions of several performance appraisal systems. We next test our hypotheses in the third section and offer implications of results.

2. Hypotheses development

2.1 Performance appraisal systems

Performance management can be defined as “a continuous process of identifying, measuring, and developing the performance of individuals and teams and aligning performance with the strategic objectives of an organization” (Aguinis, 2009, p. 2). Formal performance appraisal systems are components of performance management systems (Aguinis and Pierce, 2008) and are aligned with high-performance work practices, which have been linked to corporate financial performance (Huselid et al., 2005). Performance
appraisal is the “systematic description of an employee’s strengths and weaknesses,” which is typically conducted once per year (Aguinis and Pierce, 2008, p. 140). To distinguish the performance of employees through performance appraisals, organizations use a variety of means in which one or more raters, such as a subordinate, superior, peer or customer, evaluates the performance of a ratee. Bernardin et al. (1998) and Bernardin and Russell (2013) offered several prescriptions for effective performance management and appraisal. They noted that evaluators should strive for as much precision in defining and measuring performance dimensions as is possible; link performance dimensions to internal and external customer requirements; use multiple raters; and incorporate the measurement of situational constraints. Attention to these prescriptions may reduce the likelihood of litigation, which is often the result of contested performance appraisals (Bernardin and Russell, 2013).

Evaluation formats typically used in performance evaluations are of two general types: absolute and relative (Cascio, 1991). The primary distinction between the two types is the standard of comparison used, with relative formats requiring raters to appraise individuals relative to one another and absolute formats requiring raters to appraise individuals against a standard (Roch et al., 2007). Two meta-analytic studies that have investigated the difference between relative evaluation formats, such as the FDRS, and absolute formats found that relative formats had higher correlations with quantitative ability, general mental ability, production quantity, sales volume, perceptual speed and spatial/mechanical ability (Heneman, 1986; Nathan and Alexander, 1988). Such findings indicate that relative formats may be better positioned to capture job performance than absolute formats, since these criteria represent either different components of performance, such as production quantity, or determinants of performance, such as general mental ability (Roch et al., 2007). So, despite the trends noted at the outset indicate that the use of FDRS has been discontinued by some organizations, the validity of relative ranking approaches may warrant their continued use.

Advocates of FDRS have further offered other benefits to this relative approach, such as the mitigation of subjectivity biases. These biases include leniency, in which evaluators tend to give higher evaluations to ratees than they objectively deserve, or compression, in which little differentiation between ratees is prevalent (Berger et al., 2013). Partially attributable to the prevalence of leniency bias and other related biases, Jack Welch and others have advocated the use of FDRS in organizations (Meisler, 2003). Anecdotal evidence of leniency bias exists. Forced distribution “usually presents raters with a limited number of categories (usually three to seven) and requires (or forces) the rater to place a designated portion of the ratees into each category” (Bernardin and Russell, 2013, p. 249).

FDRS are used to achieve several purposes. At one extreme, organizations use this information to terminate poorly performing employees at the low end of the performance category, while at another, organizations collect the information for record-keeping purposes only, with no administrative outcomes (Schleicher et al., 2009). In between, organizations use these appraisals to determine promotions or demotions, different levels of compensation or different assignments (Schleicher et al., 2009). Most studies examine FDRS used for administrative purposes (e.g. promotions, raises), rather than non-administrative purposes (e.g. research, development) (Jawahar and Williams, 1997), as the former is more likely to be of concern to managers and subordinates due to leniency bias.

Absolute systems, such as a standards-based or group-based systems, are also used in organizations (Staw, 1986; Roch et al., 2007; Blume et al., 2013). The standards-based system requires raters to make comparisons of ratees’ performance to particular standards of expected performance. Standards could be based on specific qualitative or quantitative measures, which are derived from the tasks, duties and responsibilities of a job as defined in
its job description. Quantitative measures are objective and could include a specific dollar amount of sales, number of absences or errors and productivity levels, while qualitative measures are more subjective and could include customer satisfaction scores. Another type of performance appraisal system is a group-based system, in which raters make comparisons of a group of ratees’ performances to established organizational goals. Organizational goals may speak to benchmarks of sales, profitability, productivity or other specific objectives.

Organizational goals may further include an attention to talent management by focusing on talent with characteristics that may positively impact engagement and performance. These include psychological entitlement, conscientiousness, extraversion, agreeableness, self-serving upward influence behaviors and pro-organizational behaviors.

2.2 Psychological entitlement
Psychological entitlement (PES) can be defined as a “stable and pervasive sense that one deserves more and is entitled to more than others” (Campbell et al., 2004, p. 31). Stemming from the literature in narcissism, entitlement is often at the heart of many discussions regarding the distribution of resources. Since the 1970s, the topic has become increasingly prevalent in all walks of life, impacting academics, workplaces and society (e.g. Campbell et al., 2004; Twenge and Foster, 2008; Harvey and Martinko, 2009). At issue within the literature on the PES is whether individuals deserve the outcomes to which they feel they are entitled (Feather, 1999) as oftentimes entitlement perceptions are based on unbalanced assessments of reciprocity (Harvey and Martinko, 2009). In other words, individuals may feel entitled to positive outcomes in the workplace despite lagging inputs. Individuals with higher levels of PES have been linked to a variety of self-serving and selfish behaviors, such as lower levels of empathy, greater game playing and interpersonal aggression, and feelings that they deserve higher salaries than fellow coworkers (Campbell et al., 2004). Entitlement perceptions have also been found to correspond to political behavior, coworker abuse (Harvey and Harris, 2010), perceptions of abusive supervision, organizational deviance and upward undermining (Harvey et al., 2014).

Entitled individuals have a consistent, positive view of themselves and prefer to be treated as special or unique in social settings (Snow et al., 2001). They further believe that they are due certain rewards and compensation and are likely to block out any information that contradicts that view (Snow et al., 2001). They apply a self-serving cognitive bias when assessing the performance of others (Harvey and Martinko, 2009). Accordingly and in accordance with the social exchange aspect of equity theory, such individuals may feel entitled to high-performance appraisal evaluations when compared with their peers just as they feel entitled to more pay than their peers (cf. Campbell et al., 2004). Accordingly, we propose the following hypothesis:

\[ H1. \text{Individual-level PES will be positively related to the attractiveness of an organization utilizing an FDRS.} \]

2.3 The five factor model (FFM) of personality
Judge et al. (2002) identified a consensus suggesting that the FFM of personality can be used to describe some of the most important aspects of personality. The FFM consists of conscientiousness, agreeableness, extraversion, neuroticism and openness to experience (Costa and McCrae, 1992). Conscientiousness refers to dutifulness, achievement-striving and competence. Agreeableness relates the tendency to be trustworthy, empathetic and tenderminded. Extraversion relates to the tendency to be sociable, warm and assertive. Neuroticism relates to a variety of negative characteristics, such as anxiety,
insecurity and hostility. Openness to experience refers to being imaginative, nonconforming and autonomous.

Considerable research over the past few decades on the FFM has helped to develop a better understanding of the way the factors of the FFM influence the types of job settings individuals prefer and seek (Mount et al., 2005; Barrick et al., 2013). Barrick et al. (2013) used the theory of purposeful work behavior to suggest that individuals strive to naturally express their personality traits to achieve their higher-order goals. As an example, Barrick et al. (2013) noted that highly extraverted employees who are ambitious and dominant are predisposed to choosing goals that fulfill their desire to exert power and influence over others. Barrick et al. (2002) found that conscientious individuals choose goals related to their tendency to strive for achievement; extraverted individuals choose goals related to status striving; and agreeable individuals choose goals related to communion striving.

Hogan and Holland (2003) differentiated the FFM domains by the two motivational dimensions of “getting ahead” or “getting along.” The authors notes that “people always live (work) in groups, and groups are always structured in terms of status hierarchies” (p. 100). Accordingly, two broad motive patterns can distinguish individuals by their desire to get along with others in groups or to get ahead of others to achieve status. Getting along domains are conscientiousness (people with predictable behavior), emotional stability (people who are more positive) and agreeableness (people who have more empathy for others). The authors also characterized emotional stability as a getting ahead domain (people who are more confident), along with extraversion (people who are ambitious) and openness to experience (people who are curious and eager to learn). Oh and Berry (2008) confirmed these conceptualizations and added that extraversion could also be considered a getting along domain, noting its impersonal components, while conscientiousness could also be considered a getting ahead domain, noting its achievement-striving components.

We make the case that these two broad motivational tendencies of getting along and getting ahead may correspond to preferences for relative, standards-based or group-based performance appraisal systems. Relative systems such as the FDRS, characterized by distinctions between high and low performers, are likely to appeal to individuals focused on getting ahead, while standards-based or group-based systems may appeal to individuals characterized by getting along motivational traits.

Due to the achievement-striving nature of conscientiousness and its strong relationships with all aspects of job performance (e.g. Barrick and Mount, 1991; Ones et al., 2007), we follow Oh and Berry’s (2008) conceptualization of conscientiousness as a getting ahead domain. Based on this conceptualization, one could make the supposition that individuals with greater levels of conscientiousness may find FDRS in organizations to be attractive. FDRS foster competition between individuals and those striving to advance and achieve may find such systems attractive. The social exchange aspect of equity theory additionally suggests that such individuals will be pleased with greater rewards reaped under systems in which their performance is so well distinguished:

H2. Conscientiousness (as rated by significant others/close friends) will be positively related to the attractiveness of an organization utilizing an FDRS.

Extraversion is a second personality factor of the FFM that may relate to the attractiveness of an FDRS. Extraverted individuals’ confidence that their social reputations, ability to interact positively and assertive nature may bode well in a comparison-based performance appraisal system. Furthermore, the status-striving nature of extraversion and the tendency of extraverted individuals to strive for power and influence (cf. Barrick et al., 2002; Barrick et al., 2013) suggest that extraverted individuals may find FDRS attractive. Status seeking may facilitate “getting ahead” (Hogan et al., 1985), feelings of superiority (Barrick et al., 2002) and/or the attraction of social attention (Ashton et al., 2002). Furthermore, as Bendersky and
Shah (2013) have posited, extraverted individuals who work in groups may initially send higher status signals to others, but over time group members may instead perceive such individuals as self-interested and self-aggrandizing. Blume and colleagues (2013) asserted that "more extraverted individuals might be more attracted to [forced distribution ranking systems] if they believe their assertiveness and interpersonal interactions will enable them to make good first impressions and positively influence others' perceptions" (p. 374). The social exchange aspect of equity theory further underscores the way an FDRS, which well distinguishes high performers, may appeal to such status-strivers. Therefore, the following hypothesis is offered:

**H3.** Extraversion (as rated by significant others/close friends) will be positively related to the attractiveness of an organization utilizing an FDRS.

Agreeableness is a third domain of the FFM of personality. Agreeableness includes facets of trust, altruism, tender-mindedness and compliance (Costa and McCrae, 1992). Agreeable individuals tend to be passive, conforming (Costa and McCrae, 1992), cooperative in interpersonal settings (LePine and Van Dyne, 2001), valuing conflict-free, harmonious relationships (Randall and Sharples, 2012) and getting along motivational dimensions (Hogan and Holland, 2003). Such individuals seem likely to be accepting of group-based performance appraisal systems and less likely to be accepting of systems that pit individuals against one another. Accordingly, we posit the following:

**H4.** Agreeableness (as rated by significant others/close friends) will be negatively related to the attractiveness of an organization utilizing an FDRS.

**H5.** Agreeableness (as rated by significant others/close friends) will be positively related to the attractiveness of an organization utilizing a group-based performance appraisal system.

We did not hypothesize relationships with the other two factors of the FFM (openness to experience and emotional stability), since these dimensions capture more personal characteristics (e.g. depression and anxiety or curiosity and broadmindedness) rather than interpersonal, relational characteristics (cf. Barrick and Mount, 1991).

### 2.4 Subordinate influence ethics (SIE) scale

The SIE scale focuses on upward influence and the ethical tactics that individuals may use to influence superiors to advance in the workplace. Ralston and Pearson (2010) identified four types of influence behaviors used to get ahead: self-serving behaviors; pro-organizational behaviors; maliciously intended behaviors; and impression management behaviors. Within the present context, we focus on two of the four upward influence behaviors: self-serving behaviors and pro-organizational behaviors. These two types correspond to the motivational dimensions of getting along (pro-organizational behaviors) and getting ahead (self-serving behaviors).

Self-serving upward influence behaviors exemplify an agency theory interpretation of human behavior (Fama, 1980) in that the individual puts his or her own interests above the interests of the organization or others. Such individuals seem likely to be motivated to get ahead of others within an organizational setting. Similar to the aforementioned getting ahead motivations, such individuals may consider FDRS an attractive way to be distinguished. Equity theory further suggests such individuals will view the social exchange under an FDRS to be fair.

Examples of getting ahead behaviors from the SIE scale include: “use their network of friends to discredit a person competing with them for a possible promotion,” “identify and work for an influential supervisor who could help them get an advancement” and
take credit for a good job that was done by their subordinates” (Ralston and Pearson, 2010). Such competitive, getting ahead types of behaviors seem consistent with the preference for a competitive type of performance evaluation system, such as the FDRS. Therefore, we offer the following hypothesis:

**H6.** Self-serving advancement strategies will be positively related to the attractiveness of an organization utilizing an FDRS.

Pro-organizational upward influence behaviors are behaviors that tend to be acceptable to organizations, and sanctioned by organizations. Such behaviors are likely to be practiced by good organizational citizens motivated by the tendency to get along. Within the SIE, items assessing pro-organizational upward influence behaviors include the following: “demonstrate ability to get the job done,” “help subordinates develop their skills” and “maintain good working relationships with other employees” (Ralston and Pearson, 2010). These getting along types of behaviors seem consistent with the preference for a non-competitive, standards-based performance appraisal system, so we offer the following hypothesis:

**H7.** Pro-organizational advancement strategies will be positively related to the attractiveness of an organization utilizing a standards-based performance appraisal system.

### 3. Methods

#### 3.1 Sample and procedures

The participants of the study consisted of a sample of 148 graduate-level students enrolled in MBA courses and 148 matched pairs of close friends or significant others (average age = 32.2; 80 males; 70.9 percent with supervisory work experience; 87.2 percent with work experience; 103 US citizens). Students were enrolled in a medium-sized private university in the southeastern region of the USA. They were asked to complete the first half of a questionnaire voluntarily in class. This portion of the survey contained the survey items representing the attractiveness scales of the three types of performance appraisal systems as detailed in the Blume et al. (2013) study. Also included were the items from the PES developed by Campbell et al. (2004) and the items from the SIE scale developed by Ralston and Pearson (2010). Participants were also asked to complete demographic questions along with several questions relating to work experience. Administrators then asked them to code that survey and the second half of the survey for matching purposes. Administrators asked them to ask a close friend, relative or a significant other to complete the second half of the survey, which consisted of the personality items from the version of the FFM of personality (John and Srivastava, 1999). In total, administrators distributed 163 surveys, yet 15 were not retained as the matched sample surveys were not returned, yielding a sample size of 148 matched pairs of individuals. Respondents who returned the surveys were given extra or course credit.

#### 3.2 Measures

##### 3.2.1 Attractiveness of the performance appraisal systems

Following the descriptions developed in Blume et al. (2013), each of the three types of performance appraisal systems was characterized by a description of three companies: one that utilized the FDRS, one that utilized the standards-based system and one that utilized the group-based system. Participants were given the description, along with a list of bullets from the Blume et al. (2013) study with the “proponents’ beliefs” about the system, along with the “detractors’ beliefs” about the same system. These beliefs followed a description of the administrative outcomes (pay raises) awarded to ratees for various levels of performance (cf. Jawahar and
Williams, 1997; Blume et al., 2009). On a five-point Likert-type of scale, participants were asked to indicate whether they would like to work for the company described in the vignette and whether they would be attracted to pursue employment with the company as described. Participants indicated their answers using a five-point Likert type of scale anchored by 1 = strongly disagree and 5 = strongly agree. Cronbach’s $\alpha$ for the two items representing the FDRS was 0.97, for the two items representing the standards-based system was 0.92 and for the two items representing the group-based system was 0.95. We alternated the order in which the three variables were presented to respondents.

3.2.2 FDRS. The company that used the FDRS was described as follows: “This company type uses a comparative system in which employees are ranked against a peer group. Managers assign each employee to one of three categories, with 20 percent of employees receiving the ‘high performance’ ranking, 70 percent receiving the ‘average performance’ ranking and 10 percent receiving the ‘low performance’ ranking”. Each employee receives one of these rankings every year. These rankings are used to distribute much greater rewards to the high performers than to the average performers. The 10 percent of employees receiving the low performance ranking are not given rewards, if these employees do not improve their performance, usually either they resign or their employment is terminated.

Proponents’ beliefs.
- It is important to reward the doers. Clearly differentiating between higher and lower performers attracts and retains the higher performers.
- “Low performers” will be more satisfied working in another company where they can be more successful. Neither these “low performers” nor the company will benefit from continuing the employment relationship.
- This reward system stimulates a performance culture that does not tolerate mediocrity and lessens the drag on organizational performance from “low performers.”

Detractors’ beliefs.
- A comparative system creates internal competition that can destroy employees’ teamwork and lead to a dysfunctional work environment where political games are more likely to be played.
- Forcing managers to label some as “low performers” could be arbitrary if everyone in the peer group is doing a good job.
- Being labeled as a “low performer” can be demoralizing and counterproductive to improving individual performance.

Standards-based system. The company that used the standards-based system was described as follows: “This company type uses performance standards as a basis for determining employees’ rewards. Those employees exceeding the performance standards receive rewards that are slightly above the average rewards given to those that meet the performance standards. Usually, about half the employees exceed standards while the other half meets the standards. The few employees who do not meet standards are given coaching to improve performance and their employment is rarely terminated.

Proponents’ beliefs.
- Individual performance standards are a useful way to communicate expectations to employees and focus their attention and effort on these key factors.
- Employees who meet the standards are rewarded accordingly while those who exceed the standards receive higher rewards, so that individuals are rewarded based on their contributions.
Greater rewards can be given to employees who contribute more while it is less likely to encounter the potential negatives of a comparative system, such as large status and pay differences that can develop over time.

Detractors’ beliefs.

- There are small differences in performance ratings and in the rewards given to individuals, which reduces individual motivation and promotes the status quo.
- Employees may be too focused on their individual performance goals to the detriment of group and organizational goals.
- In non-comparative systems, employee performance ratings tend to be inflated and distinctions between higher and lower performers are lost. This may reduce the incentive of employees to change or improve their performance.

Group-based system. The company that used the group-based system was described as follows: this company type bases rewards on organizational work unit performance. All employees that have the same job functions within the work unit receive similar rewards. Employees work with management to select work unit performance goals and if these goals are met, then everyone is rewarded. If the work unit misses or exceeds these performance goals, then all employees are rewarded accordingly.

Proponents’ beliefs.

- It creates a cooperative rather than competitive culture that promotes teamwork.
- Employees adopt a broad perspective to think of achievement in terms of the work units’ mission and goals.
- It avoids the difficult task of determining levels of performance at the individual employee level. Individual defensiveness is reduced and employees can more readily give and receive constructive feedback.

Detractors’ beliefs.

- There is a weaker link between individual performance and rewards that can discourage outstanding individual performance and encourage social loafers (i.e. the system does not reward the doers).
- Low individual performers can receive more rewards while high individual performers receive fewer rewards than their performance warrants.
- Circumstances outside of the control of the employees in the work unit may negatively affect performance and influence whether goals are met.

3.2.3 Psychological entitlement scale. The PES scale consisted of nine items on a seven-point Likert-type scale anchored by 1 = strong disagreement and 7 = strong agreement. The scale was validated previously with several samples by Campbell et al. (2004). Example items include: “I demand the best because I am worth it,” and “If I were on the Titanic, I would deserve to be on the first lifeboat.” Cronbach’s α for the nine items representing the PES scale was 0.87.

3.2.4 FFM of personality. The validated FFM scale by John and Srivastava (1999) consisted of 44 items that assessed conscientiousness, agreeableness, extraversion, emotional stability and openness to experience. Instead of asking respondents to answer questions for themselves, administrators asked respondents to give the survey to a significant other or close friend to complete. Previous research has found support for the validity of the FFM of personality when rated by acquaintances (Kluemper et al., 2015). The significant other or close friend was directed to complete the survey with the following
statement: “You see your significant other or friend as someone who” – example items assessing conscientiousness include: “is a reliable worker” and “does things efficiently.” Cronbach’s α for the nine items representing conscientiousness was 0.84. Example items assessing agreeableness include: “is generally trusting” and “has a forgiving nature.” Cronbach’s α for the nine items representing agreeableness was 0.81. Example items assessing extraversion include “is outgoing, sociable” and “has an assertive personality.” Cronbach’s α for the eight items representing extraversion was 0.80. Example items assessing neuroticism include “can be moody” and “gets nervous easily.” Cronbach’s α for the eight items representing neuroticism was 0.68. Example items assessing openness to experience include “is inventive” and “values artistic, aesthetic experiences. Cronbach’s α for the ten items representing openness was 0.76.

3.2.5 SIE Scale. The validated SIE scale by Ralston and Pearson (2010) consisted of 24 items on an eight-point scale derived to assess self-serving behaviors, pro-organizational behaviors, maliciously intended behaviors or image management behaviors. We excluded image management items from the analyses, since this variable did not emerge in numerous cultural contexts when assessed by Ralston and Pearson (2010, p. 162), who determined image management is not “cross-culturally relevant,” so they deleted image management from their three dimension structure. We retained malicious intentions in the model to retain Ralston and Pearson’s (2010) three dimension structure, though we did not hypothesize relationships with this variable. Participants used an EIGHT-point Likert-type of scale anchored by 1 = extremely unacceptable and 8 = extremely acceptable. Participants were asked to indicate “how ethically acceptable you think that your coworkers would consider each strategy as a means of influencing superiors.” For the present study, we used two of these behaviors: self-serving and pro-organizational behaviors. Example items for self-serving behaviors include: “spread rumors about someone or something that stands in the way of their advancement” and “try to influence the boss to make a bad decision, if that decision would help him get ahead.” Cronbach’s α for the six items representing the self-serving advancement strategies scale was 0.87. Example items for pro-organizational behaviors include “demonstrate the ability to get the job done” and “behave in a manner that is seen as appropriate in the company.” Cronbach’s α for the six items representing the pro-organizational advancement strategies scale was 0.64.

4. Results

Table I presents the means, standard deviations and reliability coefficients of the study variables. To determine whether any demographic items correlated to the outcome variables, we ran correlational analyses with dummy variables representing gender, US citizenship and current employment, along with age, years of full-time work experience and years of supervisory experience. The US citizenship dummy variable was the only significant correlate of the standards-based (r = −0.27, p < 0.01, mean for US citizens = 3.50, SD = 0.88, n = 103; mean for non-US citizens = 4.02, SD = 0.88, n = 44), so we controlled for that variable accordingly. Overall, results suggested that non-US citizens were more attracted to the standards-based appraisal systems.

To test H1–H4 and H6, which proposed that psychological entitlement, conscientiousness, extraversion and self-serving strategies would positively relate, and agreeableness would negatively relate to the attractiveness of an FDRS, we ran a hierarchical regression equation. No outliers beyond three standard deviations were identified and the variance inflation factors never exceeded 1.64, which is well below the critical level of 10, considered dubious by Myers (1990). Overall, results suggested that the model offered an explanation for 11 percent of the variance in the attractiveness of an FDRS.
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Notes: A1PA is the mean of the two items representing the attractiveness of an FDRS; B1PA is the mean of the two items representing the attractiveness of a standards-based performance appraisal system; C1PA is the mean of the two items representing the attractiveness of a group-based performance appraisal system; PES is the mean of the psychological entitlement items; SS is the mean of the self-serving strategies for advancement; MI is the mean of the malicious intentions items; PO is the mean of the six pro-organizational strategies for advancement; Extra is the mean of the extraversion items; Cons is the mean of the conscientiousness items; Agree is the mean of the agreeableness items; Open is the mean of the openness to experience items; Neuro is the mean of the neuroticism items; and USCit is the dummy variable representing USA citizenship. *Coefficients of 0.17 or greater significant at the 0.05 level (two-tailed test); **coefficients of 0.21 or greater significant at the 0.01 level (two-tailed test).
In the first step, we entered the independent personality variables of agreeableness, conscientiousness, extraversion, openness to experience and neuroticism. In the second step, we entered the self-assessment of psychological entitlement. In the third step, we entered the evaluations of others’ self-serving advancement strategies, malicious intentions and pro-organizational behaviors. As presented in Table II, our results provided some support for the significance of the overall model. More specifically, results provided support for the assertion in H1 that individuals with high levels of psychological entitlement would be attracted to FDRS. H2 proposed a positive relationship between the attraction to FDRS and levels of conscientiousness, yet results surprisingly indicated a negative relationship.

To test the H7, which proposed that pro-organizational advancement strategies would correspond positively to the attractiveness of a standards-based performance appraisal system, we conducted a hierarchical regression equation in which the standards-based performance appraisal mean was entered as the dependent variable and the dummy variable representing US citizenship was entered in the first step and the variables representing the independent variables were entered as they were in the first regression equation above. While the control variable was significant, pro-organizational advancement strategies were not significant.

To test the H5, which proposed that agreeableness would be positively related to group-based management systems, we conducted the same hierarchical regression equation as in the first equation with the group-based management system as the dependent variable. Results were not significant. In both sets of analyses, we did not identify any significant outliers.

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**Notes:** $n = 146$. *Significant at the $p < 0.05$ level in a two-tailed test; **significant at the $p < 0.01$ level in a two-tailed test; ***significant at the $p < 0.001$ level in a two-tailed test.
beyond three standard deviations of the means and the variance inflation factor was 1.0.

We next conducted a path analysis using the Lisrel statistical package, version 8.8. We entered the dummy variable for US citizenship, along with the construct scores for the hypothesized independent (x) variables (others’ rated extraversion, others’ rated agreeableness, others’ rated conscientiousness, pro-organizational advancement strategies, self-serving advancement strategies and psychological entitlement). The means for the performance appraisal options of forced distribution, a standards-based system and a group-based system were entered as dependent (y) variables. Error variances of the variables were permitted to covary. Results indicated good overall fit ($\chi^2 = 14.09$, df = 13, $p$-value = 0.37, RMSEA = 0.025, NFI = 0.90, NNFI = 0.95, CFI = 0.98, GFI = 0.98, AGFI = 0.92, number of observations = 146), using generally accepted indices of overall fit indices (Kline, 1998). Figure 1 presents our overall model with each of the hypotheses identified and significant paths identified with an asterisk.

5. Discussion

5.1 Overview

The present study offers several distinct contributions to the performance appraisal and talent management literature. First, we examine the FDRS, which is an approach to performance appraisals that is widely used within organizations, yet rarely analyzed empirically (cf. Schleicher et al., 2009). Advocates of FDRS assert that such systems force managers to be honest in conducting performance evaluations, reducing leniency bias (Meisler, 2003; Boehle, 2008; Blume et al., 2013). Some have indicated that using an FDRS stimulates a high-performance and high-talent culture in which honesty is expected and poor performance is not tolerated (Guralnik et al., 2004). Others have found that high achievers and high performers are likely to find such systems attractive (Blume et al., 2013). FDRS tend to be most favorably received in high-pressure, results-oriented cultures (Bates, 2003).

Figure 1. Standardized path analysis results using Lisrel

Note: *$p<0.05$, (two-tailed test)
While the FDRS may result in job satisfaction for achievement-oriented individuals, our findings suggest that such systems are attractive to workers with individual characteristics that may be consistent with various negative outcomes in organizations. We identified no support for a relationship between grade point average with perceptions of the attractiveness of an FDRS. Instead, we found support for the hypothesis that individuals with high self-evaluations of psychological entitlement consider FDRS attractive. We further found an un-hypothesized relationship, which suggested that individuals whom others consider low in conscientiousness are likely to consider FDRS attractive. Conscientiousness corresponds to higher levels of dutifulness and achievement-striving, which are beneficial personal traits to organizations, so such findings, though possibly attributable to chance, certainly merit further study.

One potential avenue of thought concerns the possibility that conscientious individuals may also be conscientious about maintaining positive coworker relationships. They might consider FDRS to be detrimental to organizational citizenship behaviors, since workers are pitted against one another in what Enron termed “rank and yank” systems, reducing the incentive to exhibit helping behaviors with coworkers. Such findings provide support for Hogan and Holland’s (2003) characterization of conscientiousness as a “getting along” construct.

Another avenue of thought is the possibility that highly conscientious workers may feel less control in an FDRS, since they would not be appraised against a standard but instead be ranked among coworkers. A study by Boyce et al. (2005) of 9,570 individuals found that individuals high in conscientiousness who were unemployed for three years experienced a 120 percent higher decrease in life satisfaction than those with lower levels. Conscientious individuals may believe that FDRS put them at greater risk for lower appraisals than standards-based systems and, therefore, a greater risk of unemployment. While we posited that the social exchange aspect of equity theory suggests conscientious individuals would value the potential for big rewards for high evaluation scores, those same individuals may perceive that the risk in an FDRS may not outweigh the potential rewards.

Though we did not find support for our hypotheses suggesting that agreeableness, self-serving advancement tactics and extraversion corresponded to the attractiveness perceptions of FDRS, our findings may be helpful to organizations when considering their implementation. We also did not find support for our hypotheses on the relationships between agreeableness and the attractiveness of group-based performance appraisal systems or the relationship between perceptions of subordinates’ use of pro-organizational advancement strategies with standards-based performance appraisal systems, significant relationships between US citizenship were identified in our standards-based model. Specifically, we found that non-US citizens were more attracted to standards-based systems than US citizens. Previous studies examining the attractiveness of various performance appraisal systems have not provided evidence of citizenship variations (e.g. Roch et al., 2007; Blume et al., 2013), yet such variations may be relevant in multinational workplaces.

5.2 Implications

Organizations considered “attractive” to job seekers and job incumbents are better able to attract, develop, manage and retain top talent, which offer such organizations a competitive advantage over their peers (Berthon et al., 2005). Berthon et al. (2005, p. 151) defined organizational attractiveness as the “envisioned benefits that a potential employee sees in working for a specific organization.” Over the past couple of decades, consultants and academics alike have published numerous articles about the resources required to be attractive and benefits derived by being “attractive” (Herman and Gioia, 2001; Higgs, 2005).

Factors contributing to the attractiveness of an organization for the MBA population may seem somewhat surprising. One relatively recent study by Montgomery and
Ramus (2011) found that MBA students look for organizations that offer an intellectual challenge. The study further found that MBA students are willing to forgo financial benefits to work for a socially responsible organization with a good reputation. One way to achieve a good reputation is through talent management.

Talent management is a business strategy that corresponds to an organization’s commitment to attracting, developing, managing and retaining talented employees. Motivating and engaging employees through performance management is one component. Performance evaluations in some organizations are significantly important for motivating staff, communicating and aligning organizational goals, enhancing positive relationships between superiors and subordinates, and developing positive attitudes and behaviors (Ahmed et al., 2013).

Research firm CEB estimates that a company of 10,000 employees typically spends $35m on performance evaluations annually (Cunningham, 2015). Furthermore, CEB has found that 95 percent of managers are dissatisfied with the way their companies conduct performance reviews, while 90 percent of human resource managers in firms have indicated that such reviews do not accurately assess performance (Cunningham, 2015). Such findings are disturbing, given the primary goal of many organizations in crafting performance appraisal systems is to improve individual and organizational performance (Ahmed et al., 2013).

A recent study by Gallup (Clifton, 2017) found that only 33 percent of US employees are actively engaged; 51 percent are “just there” and 16 percent are actively disengaged with malicious intentions to destroy what the most engaged employees are building. After commenting on these findings, Jim Clifton called on companies to be more disruptive by chucking forced ranking systems and annual reviews and replacing them with more frequent coaching sessions.

A small number of firms have been experimenting with simpler, more informal appraisal systems characterized by more frequent, motivational conversations between managers and subordinates (Kauflin, 2017). Some of the companies that have made these changes have recently been ranked on the Forbes’ list of the happiest companies in which to work. The main premise behind these no ratings plans is that offering more immediate feedback to workers and encouraging and coaching good behaviors by playing to employee strengths enhances performance (Sahadi, 2015). Lisa Barry, the global talent, performance and rewards leader for Deloitte Touche Tohmatsu, suggests that FDRS are no longer useful in the context of talent-rich, knowledge-driven workforces. FDRS work better for lower level positions (Deloitte CIO Journal, 2014). Despite such assertions and as noted at the outset, 21 percent of Fortune 500 and mid-size firms continue to use FDRS (Sahadi, 2015).

Our results provide insight into why some organizations may have stopped using FDRS and why others may be dissatisfied with the system. While energizing employees to perform at higher levels through competitive systems such as the FDRS may create a competitive atmosphere that elevates the performance of all employees, an equally plausible outcome is the creation of a cutthroat environment where potential good ideas are never brought to light for fear of not being able to establish quantifiable results in an evaluation cycle. Enron provides a good example of the latter with its well-known rank and yank evaluation system, illustrating the perils of pushing employees to focus on getting ahead in the short term at the expense of other stakeholders (Gibney, 2005). In an era in which businesses have come to value corporate responsibility and sustainability, developing human resource systems that promote the values of employees who can simultaneously get along and get ahead well into the foreseeable future is important.

5.3 Limitations and suggestions for future research

While our study offered several important implications to organizations determining the attractiveness of various methods of performance appraisal, several limitations should
be noted. The first limitation relates to the characteristics of the study sample, which was
drawn from a matched sample of 148 students and their significant others or familiar
acquaintances in a single university. While the students were at the graduate level, enrolled
in MBA courses, we acknowledge that the generalizability of larger populations drawn from
organizations could be stronger. Our second limitation relates to the predictive ability of our
hypothesized model. Since our model predicted 11 percent of the variance in the FDRS
outcome variable, other variables should additionally be analyzed to develop a more
comprehensive understanding of the factors that correspond to the attractiveness of an
FDRS. Tenure within an organization, performance appraisals, justice perceptions,
characteristics of the job market and job opportunities, organizational level, and salary level
could further impact preferences for particular performance appraisal systems. Future
studies should investigate other factors that may correspond to such preferences.

Future studies may further want to investigate the attractiveness of various performance
appraisal systems to non-US citizens. While we do not want to capitalize on chance
outcomes, our findings, which suggest that non-US citizens may find standards-based
performance appraisal systems more attractive than US citizens, warrant further analysis.
One unexplored avenue that may be fruitful to researchers is the examination of how
differences in value systems may play a role in explaining these preferences. As an example,
Schwartz’s (1992) individual-level self-enhancement values of achievement and power may
correspond to preferences for FDRS, while the self-transcendent values of universalism and
benevolence may correspond to preferences for standards-based and group-based systems.

A strength of our study relates to our paired sample of MBA students and significant
others or close acquaintances, since MBA students tend to be motivated and are considered
attractive to employers. Yet this may also limit generalization to other types of workers.
Future studies may want to examine other job incumbents and other student populations at
lower levels and outside of business.

Despite these limitations, our study offers a first glimpse in some of the individual
characteristics that may correspond to the attractiveness of an FDRS. Advocates of FDRS
who claim that such systems are attractive to high performers may find our results that
refute such findings intriguing. Instead of attracting high performers with high levels of
intelligence, our study suggests that such systems are attractive to skeptical and entitled
employees who find self-serving advancement behaviors to be acceptable.

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Further reading

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Abstract
Purpose – The purpose of this paper is to examine the 2010–2015 financial performance (FP) of the national non-profit USA Triathlon (UST) using financial effectiveness (FE) indicators and financial efficiency (FE) ratios.

Design/methodology/approach – Archival data were used together with a case study method. FP was evaluated by net income; FE was indicated by total assets and total revenues, while FY was examined by program services ratios and support services ratios.

Findings – On average, the FP of the organization was positive ($2,100,591 net income per year), FE was moderate (66 percent increases in assets and revenues) and the FY was mixed (80 percent revenues spent on program services with an impressive return on asset of 14 percent).

Research limitations/implications – By using case study method, the results may not be generalizable to other national non-profit sports organizations with non-financial objectives.

Practical implications – The results revealed that overall FP is a product of both FE and FY, making the study valuable to managers who are often faced with unreliable financial resources.

Originality/value – The study utilized both FE and FY measures to evaluate the FPs of UST – a major shortfall in similar studies.

Keywords Financial performance, Non-profit organization, Financial efficiency, Financial effectiveness

Paper type Research paper

1. Introduction
Founded in 1982, USA Triathlon (UST) is the national governing body for the sport of triathlon, making it responsible for the conduct and administration of duathlon, aquathlon, aquabike, Winter triathlon, off-road triathlon and paratriathlon in the USA. UST sanctions more than 4,300 races and connects with nearly 500,000 members annually. UST provides leadership and support to elite athletes, coaches and race directors on the grassroots level and those competing at the international level. The mission of UST “is to grow and inspire the triathlon community,” and its vision is “to provide the resources required for all in the triathlon community to reach their full potential.” UST has three core values: we value our members and other constituents; we value safety, fairness, motivation and achievement in competition; and we value fitness and health through exercise, the spirit of competitiveness and the pursuit of excellence – the multisport lifestyle (www.teamusa.org).

UST, as most NNSOs, constantly faces organizational performance (OP) pressures compounded by small budgets and unreliable donations which make it challenging to fulfill their vision and mission objectives. OP is the combined measurement of effectiveness and efficiency so as to ascertain the degree to which desired goals are attained (Kumar and Gulati, 2009; Mouzas, 2006). The components of OP represents an index of both effectiveness and efficiency used to quantify overall performance of organizations. Specific to NNSOs, OP can be divided into two broad categories – on-field and off-field performances (Table I).

As indicated in Table I, on-field performances can be measured by win–loss records, world rankings and number of medals, amongst others, while off-field performances may be
quantified by attendances, TV ratings and league expansions. As there are multiple ways of measuring OP, this study focuses on the financial performance (FP) of UST and not on-field performances. The aim of this paper is to evaluate the 2010–2015 FP of UST using financial effectiveness (FE) indicators and financial efficiency (FY) ratios.

The structure of the rest of the paper is as follows. Section 2 examines the link between FP as a component of both FE and FY. Section 3 proposes a conceptual framework and research question which rationalizes and focuses the study. Section 4 discusses the various approaches/models used to investigate organizational effectiveness (OE) with the help of past sports related studies. Section 5 examines FY using financial ratios, with a focus on program and support services ratios. Section 6 is the methodology which explains data sources, measurement variables and case study method. Section 7 is a collection of results broken down into FP results, FE results and FY results from 2004 to 2015. Section 8 is the managerial and policy implications. Finally, Section 9 provides conclusions and research implications followed by references. What then are FP, FE and FY?

2. Financial performance = financial effectiveness + financial efficiency

FP is the combined evaluation of FE and FY in the realization of desired financial goals of an organization such as attaining a positive income, also known as net profits. (Omondi-Ochieng, 2018a, b), FP is formulated thus as follows:

\[
\text{Financial performance} = \text{Financial effectiveness} + \text{Financial efficiency.}
\]  

(1)

FE is the ability of organizations to use the proper choice of activities, efforts, initiatives, strategies and/or policies to generate and maximize long-term sustainable FP. For instance, NNSOs that are financially effective tend to be better at generating additional revenues to build infrastructures through negotiating lucrative contracts for sponsorships, marketing and broadcasting rights. In other words, FE is the realization of financial goals centered on input acquisition (assets and revenues) for outcome attainment (positive financial returns or profits). In sum, FE is the capability of an organization to achieve its financial goals or targets and is measured by revenues generated and assets accumulated.

FY is concerned with minimizing financial waste as it deals with the optimal allocation and utilization of financial resources. FY is the operational ability of an organization to attain outputs with minimum level of financial costs in the process of achieving targeted financial results. FY aims at boosting productivity with minimal costs and can be evaluated by input–output ratios such as the comparison of revenues against expenses in an attempt to provide economical programs and services. By being financially efficient, a NNSO can save on cost, time and resources – by prioritizing its efforts, initiatives and policies that
enhance overall program and services efficiencies. Another purpose of this study is to analyze the FY of UST using program service ratios and support services ratios from 2010 to 2015.

3. Conceptual framework and research questions
This study argues that sustainable FP is the ultimate goal of most NNSOs as captured by FE and FY in a three-stage conceptual framework (Figure 1). The prescriptive framework stresses the inter-correlation between the two components in assessing the FP of NNSOs based on the following reasons. First, FE relates to the ability of a NNSO to acquire needed but scarce financial resources such as assets and revenues. Second, upon acquiring the scarce financial resources, the resources can be utilized efficiently in providing operational services and programs at low costs – as increasingly demanded by donors who stress financial accountability, thrift and transparency. Additionally, rising competition for revenues, medals and international recognition has pushed NNSOs to attempt to be both effective and efficient – a very difficult endeavor to accomplish. The major issues addressed in this study is to ascertain whether UST has been both financially effective and financially efficient from 2010 to 2015.

Through the development of a conceptual framework that links FP to FY and FE (Figure 1) is a broader way of analyzing, monitoring and adhering to what may lead to the realization of the mission and vision of a NNSO. The framework can enable sports managers to identify the function of each component, thus having the ability to change, adopt or take corrective action/s when needed. The present study attempts to provide answers to the following five research questions:

RQ1. Was UST financially effective as indicated by its ability to generate revenues from 2010 to 2015?

RQ2. Was UST financially effective as indicated by its ability to accumulate assets from 2010 to 2015?

RQ3. Was UST financially efficient in delivering its programs as indicated by its program service ratios from 2010 to 2015?

RQ4. Was UST financially efficient in delivering its services as indicated by its support services ratios from 2010 to 2015?

RQ5. Did the FP of UST improve as indicated by yearly net income from 2010 to 2015?

Figure 1.
Linking financial performance to financial effectiveness and financial efficiency

Note: Designed by author
Sources: Kumar and Gulati (2009), Mouzas (2006) and Greenlee and Bukovinsky (1998)
By answering the five questions, this paper presents a framework for the application of FE and FY in measuring the FP of UST from 2010 to 2015. Few studies have seldom evaluated the performance of NNSOs based on the combined impacts of FY and FE, with the majority of studies dealing with the issues of effectiveness but neglecting efficiency (see Fabianic, 1984; Frisby, 1986; Chelladurai et al., 1987; Chelladurai and Haggerty, 1991; Wolfe et al., 2002; Winand et al., 2010). The purpose of this paper is to evaluate the FP of a NNSO using FE indicators and FY ratios from 2004 to 2015.

4. OE approaches
OE is the degree of successfully producing intended, desired or expected results. The definitions of OE can vary based on specific missions, visions of NNSOs and the approaches/models utilized (Windad et al., 2014). Other related terms used to describe OE include achievements, success, excellence and performance, amongst others. The aim of this section is to explain the six basic approaches/models commonly applied to researching OE, namely – goal, internal process and systems resources, multiple contingency, competing values and multidimensional approaches (Table II).

4.1 Goal model of OE
The first way of examining OE is the goal model which is the extent to which goals are accomplished (Price, 1968; Scott, 1977). Pertaining to NNSOs, indicators of the goal model are the realization of financial targets and the winning of Olympic medals (Table III).

Previous studies have stressed the advantageous uses and applications of the goal model in sports research as: it helps in clearly communicating the purpose and direction of the organization; it assists in sharpening decision making by providing an unambiguous basis for judging success or failure; and it is a means for self-management as it helps set standards for winning and pay (Frisby, 1986; Wolfe et al., 2002; Omondi-Ochieng, 2013). In the first study, Frisby (1986) examined whether or not there was a relationship between 29 Canadian national sports governing body’s ability to acquire scarce resources and to transform their inputs into

<table>
<thead>
<tr>
<th>Model/approach</th>
<th>Effectiveness defined as</th>
<th>Indicators/Metrics</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Goal model</td>
<td>Ability of an organization to achieve desired goals</td>
<td>Realization of financial goals</td>
</tr>
<tr>
<td></td>
<td>Extent to which goals are accomplished</td>
<td>Olympic medals won</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Membership numbers</td>
</tr>
<tr>
<td>2. Internal process model</td>
<td>Extent to which employees are satisfied, committed, and motivated</td>
<td>High employee morale</td>
</tr>
<tr>
<td></td>
<td>The smooth internal functioning of an organization</td>
<td>High organizational cohesion</td>
</tr>
<tr>
<td>3. Systems resources model</td>
<td>The ability of an organization to acquire scarce resources</td>
<td>Number of strikes</td>
</tr>
<tr>
<td>4. Multiple constituency model</td>
<td>Extent to which all constituents are satisfied</td>
<td>Fairness and equitable diversity</td>
</tr>
<tr>
<td>5. Competing values model</td>
<td>The extent to which an organization maintains</td>
<td>Innovativeness and R&amp;D</td>
</tr>
<tr>
<td></td>
<td>stability and control while being adaptable and flexible</td>
<td></td>
</tr>
<tr>
<td>6. Multidimensional model</td>
<td>Success in all the above</td>
<td>Holistic index of all above indicators</td>
</tr>
</tbody>
</table>

Table II. Approaches/models of organizational effectiveness

Note: Alternative words as approaches, models and/or perspective have been used to describe OE
desired outputs, using a combination of goal and systems approach. The results indicated a positive and significant relationship between organizational structure and performance, defined as achievement of elite successes and the amounts of operating budget and increases in financial support. Additionally, the researcher reported that the organizations that were able to develop larger operating budgets tend to be more successful in international competitions. In the second study, Wolfe et al. (2002) qualitatively evaluated the perceptions of OE in intercollegiate athletics by interviewing ten stakeholders who revealed that college tend to judge their effectiveness through on-field performance, graduation rates, program ethics, image building, resource acquisitions and institutional enthusiasm. Finally, Omondi-Ochieng and Stewart (2013) applied both the goal and systems model to examine the OE of 53 African national football governing bodies that participated in the Africa Cup of Nations. The findings indicated a positive and significant correlation between the governing bodies that set the goal of qualifying for the African Cup of Nations and the amount of resources utilized. Omondi-Ochieng (2013) also reported similar results with Asian national football governing bodies. The Asian nations with the goal of qualifying for the Asia Cup of Nations and FIFA World Cup do tend to invest substantially more resources targeted toward the production of on-field success relative to those who did not qualify.

However, despite the promise of using the goal model to evaluate OE, some critics have cited three weaknesses: it is often difficult to set standards and predicting what is achievable, especially if there are too many stakeholders working in an environment of political interference and scarce resources; it ignores intangible, often shifting and non-goal dimensions of OE such as national pride, love of the game and satisfaction; and goals can also be inconsistent, contradictory or incoherent (Omondi-Ochieng, 2013; Winand et al., 2013; O’Boyle and Hassan, 2014). However, one goal that is common to all NNSOs is to improve national performance at both the Olympics and world championships.

### 4.2 Internal process model of OE

The second way of evaluating OE is the internal process model, which is the extent to which an organization is cohesively and smoothly run with satisfied, committed and motivated employees (Pfeffer, 1977; Steers, 1977). The indicators commonly used here are coach/team turnover and the number and frequency of league strikes and/or lockouts (Table IV).

The workings of the internal process approach can be illustrated by comparing number of disruptive lockouts in NFL and NBA – which indicates the poor internal workings

<table>
<thead>
<tr>
<th>Type of goal</th>
<th>Indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. On-field performance goals</td>
<td>Win–loss records and increased number of Olympic medals</td>
</tr>
<tr>
<td></td>
<td>Expand completion though new leagues and by building more stadiums to host tournaments</td>
</tr>
<tr>
<td>2. Financial goals</td>
<td>Boost match day revenues from ticket sales, food and hospitality</td>
</tr>
<tr>
<td></td>
<td>Reduce expenses while increasing revenues from TV rights and advertising so as to enhance profits</td>
</tr>
<tr>
<td>3. Public interest goals</td>
<td>Raise media coverage and social media interest</td>
</tr>
<tr>
<td></td>
<td>Grow attendance and brand awareness</td>
</tr>
<tr>
<td></td>
<td>Satisfaction with services or programs</td>
</tr>
<tr>
<td>4. Game development goals</td>
<td>Develop new and existing amateur players, clubs and teams</td>
</tr>
<tr>
<td></td>
<td>Enhance, encourage and fund the growth and development of skill, talent and professionalism at amateur levels</td>
</tr>
</tbody>
</table>

Table III. Goals of national sports organizations  

Notes: The goals of NNSOs may differ based on business model, global rankings and resources  
Sources: Frisby (1986), Mathieu et al. (2012), Omondi-Ochieng (2013), Winand et al. (2013) and O’Boyle and Hassan (2014)
between players and owners and even referees (Table IV). Previous studies have stressed that for organizations to be successful externally, they must first be successful internally (Fabianic, 1984; Chelladurai et al., 1987; Chelladurai and Haggerty, 1991; Winand et al., 2010). The first study by Fabianic (1984) evaluated the association between managerial turnover and succession on OE in major league baseball from 1951 to 1980, in view of franchise additions and relocations. OE was measured as win percentage and correlated to the average number of managers employed by a team. The researchers reported that there was no association between OE and the rate of managerial effectiveness. The second study was conducted by Chelladurai et al. (1987), who sourced data from 48 Canadian NNSOs with the help of 150 questionnaires. They concluded that OE (measured as results from elite programs and increases in mass sports participation) was derived from the combination of inputs (revenues and human resources) and throughput and output factors. In another study, Chelladurai and Haggerty (1991) expanded their previous findings by accessing the OE of 51 Canadian national sports organizations by interviewing 153 volunteers and 84 professional administrators. The results indicated that volunteer administrators were more satisfied than professional administrators, with decision making and personal relations positively correlating to higher levels of job satisfaction. Finally, Winand et al. (2010) evaluated the strategic objectives (sport results and customer engagement) and operational goals (communication and image, finance and organization) of 56 sports governing bodies and 27 Olympic sports governing bodies to report that the later was a key factor in OE.

### 4.3 Systems resources model of OE

The third way of appraising OE is the systems resources model which is the extent to which an organization acquires scarce resources from its environment (Youchtman and Seashore, 1967; Lawrence and Lorch, 1967). Previous researchers have cited the following advantages of using the systems resource model in OE studies of sports organizations: it treats the organization itself as a frame of reference, it takes into account the organization’s relations to the environment and it is ideal for the comparison of organizations with different goals (Koski, 1995; Papadimitriou, 2002; Omondi-Ochieng, 2014). In the first study, Koski (1995) analyzed the OE of voluntary amateur Finish sports clubs by surveying 835 respondents to report that the ability to obtain resources, efficiency of throughput process, realization of aims and general levels of activity were the key contributors to organizational success. The strength of this study was that the relationships between input, throughput, output and environmental variables were examined. In another study, Papadimitriou (2002) used a combination of goal and systems resource model to examine local voluntary sports organizations and reported that they were loosely structured, less bureaucratic, dependent on external resources and target moderate performances. In this study, performance was

<table>
<thead>
<tr>
<th>NBA</th>
<th>NFL</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. 1995 – 3 months</td>
<td>1968 – 12 days</td>
</tr>
<tr>
<td>2. 1998 – 6 months</td>
<td>1970 – less than 1 week</td>
</tr>
<tr>
<td>3. 2011 – 5 months</td>
<td>1974 – 2 months</td>
</tr>
<tr>
<td>4. 1982 – 4 months</td>
<td>1982 – 4 months</td>
</tr>
<tr>
<td>5. 1987 – 24 days</td>
<td>1987 – 24 days</td>
</tr>
<tr>
<td>6. 2001 – 2 weeks</td>
<td>2001 – 2 weeks</td>
</tr>
<tr>
<td>7. 2011 – 5 months</td>
<td>2011 – 5 months</td>
</tr>
<tr>
<td>8. 2012 – 4 months</td>
<td>2012 – 4 months</td>
</tr>
</tbody>
</table>

**Note:** In 2001 and 2012, NFL referees had a lockout

**Sources:** www.nba.com and www.nfl.com

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**1197**

**Table IV. NBA and NFL lockouts compared**
only indicates as number of athletic programs and number of sports offered by the clubs. Finally, Omondi-Ochieng (2014) examined how Asian national football teams acquired economic resources to advance their national teams through the Asia Cup. The results indicated that nations that regularly qualified for the tournament tend to apportion larger financial resources toward national football success through the construction of training facilities and the building of expensive stadiums to host major football tournaments.

However, critics of the systems resources model do point that real OE may be camouflaged in organizations that benefit from guaranteed government funding, such as national sports federations and that some resource-rich organizations may still fail due to the misuse of resources or corruption (Chelladurai and Haggerty, 1991; Omondi-Ochieng, 2014).

4.4 Multiple constituency model of OE

The fourth way of gauging OE is the multiple constituency model, which is the extent to which all stakeholders or clients’ needs are satisfied (Connolly et al., 1980). Indicators of the uses of this approach include diversity programs and gender equity initiatives, such as the representation of women at the Olympics. As shown in Table V, the voice of women is slowly being heard as illustrated by the rise in participation numbers – there were 49 women’s sports events in 2014, compared to 26 in 1992.

Previous researchers have noted that sports organizations cannot work in a vacuum as they must positively engage their stakeholders (attendees, social media fans, the government, corporate sponsors, teams, clubs and governing bodies) to become effective (Vail, 1986; Papadimitriou and Taylor, 2000). In the first study, Vail (1986) evaluated 33 national sports organizations with the help of 140 questionnaires to report that OE was largely due to adoptability, communication, finance, human resources and organizational planning. The study ignored sports results. Similarly, Papadimitriou and Taylor (2000) utilized a sample of 20 Greek national sports organizations to report that OE was due to: quality and stability of board members, long-term planning, sport science support, interest in athletes and internal procedures. The study measured satisfaction levels of various stakeholders but neglected goal and FP.

4.5 Competing values approach (CVA) of OE

The fifth way of measuring OE is the CVA, which is the extent to which an organization maintains stability and control while being adoptable and flexible (Quinn and Rohrbaugh, 1983). The first example of CVA in practice was when Test cricket transformed to Twenty20 cricket so as to meet spectator needs and demands. The transformation began in 2003 when England and Wales Cricket board approved a Twenty20 cricket match for a domestic tournament. The new game of Twenty20 was faster, shorter and attracted larger crowds.

<table>
<thead>
<tr>
<th>Year</th>
<th>Sports</th>
<th>Women’s events</th>
<th>Total events</th>
<th>% of women’s events</th>
<th>Women participants</th>
<th>% of women participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>1992</td>
<td>4</td>
<td>26</td>
<td>57</td>
<td>45.6</td>
<td>488</td>
<td>27.1</td>
</tr>
<tr>
<td>1994</td>
<td>4</td>
<td>28</td>
<td>61</td>
<td>45.9</td>
<td>522</td>
<td>30</td>
</tr>
<tr>
<td>1998</td>
<td>6</td>
<td>32</td>
<td>68</td>
<td>47.1</td>
<td>787</td>
<td>36.2</td>
</tr>
<tr>
<td>2002</td>
<td>7</td>
<td>37</td>
<td>78</td>
<td>47.4</td>
<td>886</td>
<td>36.9</td>
</tr>
<tr>
<td>2006</td>
<td>7</td>
<td>40</td>
<td>84</td>
<td>47.6</td>
<td>960</td>
<td>38.2</td>
</tr>
<tr>
<td>2010</td>
<td>7</td>
<td>41</td>
<td>86</td>
<td>47.7</td>
<td>1,044</td>
<td>40.7</td>
</tr>
<tr>
<td>2014</td>
<td>7</td>
<td>49</td>
<td>98</td>
<td>50.0</td>
<td>1,120</td>
<td>40.3</td>
</tr>
</tbody>
</table>

Table V. Women’s participation in the Olympic Winter Games (1992–2014)

Note: Some are mixed events

Sources: www.olympic.org/women-in-sport/background/statistics (accessed June 24, 2016)
In realizing the positive potential on attendance and corporate sponsorships, in 2005, the first international tournament was played between arch rivals Australia and New Zealand and in 2007, ICC introduced the World Twenty20 championship.

The second example of adaptation and change is 3-on-3 basketball. With the goal of revamping interest, attendance and revenues, International Olympic Committee approved the addition of 3-on-3 basketball to the 2020 Summer Olympic Games – with a few differences (Table VII).

Past researchers have noted that sports organizations ought to be flexible and adoptive to change so as to remain competitive (Shilbury and Moore, 2006; Balduck, 2009; Wemmer et al., 2016). In the first study, Shilbury and Moore (2006) used both qualitative and quantitative data to examine ten non-profit Australian national Olympic sport governing bodies. In all, 289 stakeholders from ten national Olympic sports organizations were surveyed and the data analyzed using factor analysis. The results showed that the primary indicator of OE were the ability to produce goals, followed by planning, flexibility and stability. The CVA allows managers to quickly ascertain strengths and weaknesses of their sport governing bodies. Additionally, Balduck (2009) examined non-profit sports clubs to assess program and management effectiveness of board members. The results were that the competing goals of management and participants were solved by adopting, changing and expanding existing programs. Finally, Wemmer et al. (2016) examined the effect of collaborations with competitors on the OP of non-profit sports clubs via use of outside knowledge and the adoption of new services, processes and business models. The study used an online survey of 292 members of the board of directors in Germany sports clubs. Results indicated that engagement in coopetition and outside knowledge had a positive effect on OP.

<table>
<thead>
<tr>
<th>Type of cricket</th>
<th>Duration</th>
<th>Results</th>
<th>Innings</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Test cricket</td>
<td>5 days</td>
<td>4 possible results – win, loss, tie and draw</td>
<td>2 innings of 50 overs</td>
</tr>
<tr>
<td>2. Twenty20</td>
<td>3 hours</td>
<td>2 possible results – win and loss</td>
<td>1 inning per team of 20 overs</td>
</tr>
</tbody>
</table>

**Notes:** Test cricket matches were first played in 1877. Differences based on ICC Rules

**Sources:** www.espncricinfo.com/ci/content/story/1062769.html and http://recomparison.com/comparisons/100477/one-day-vs-test-match-vs-t20-cricket/

### Table VI. Difference between Twenty20 and Test cricket

<table>
<thead>
<tr>
<th>Type of basketball</th>
<th>Scoring</th>
<th>Duration of the game</th>
<th>Other rules</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. 3-on-3</td>
<td>Every shot behind the arc is awarded 2 points. Every shot inside the arc is awarded 1 point. Every successful free throw is awarded 1 point.</td>
<td>10-minute game clock 1st team to reach 21 points or the best after 10 minutes wins 12-second shot duration clock</td>
<td>Games played in half court 4 players on roster</td>
</tr>
<tr>
<td>2. 5-on-5</td>
<td>3-points for field goal made from behind the 3-point arc. 2 points for field goal made from inside the 3-point arc. 1 point for a made free throw.</td>
<td>Four 10-minute quarters 24-seconds shot clock 5-Foul limit 5 1-minute timeouts</td>
<td>Bigger full court 6 players on roster</td>
</tr>
</tbody>
</table>

**Notes:** NBA currently sponsors NBA 3X Tour. Both rules as per FIBA

**Sources:** http://ftw.usatoday.com/2017/06/3-on-3-olympic-basketball-rules-3-pointer-shot-clock-kevin-durant-ideal-player and www.fiba.com/3x3/rules

### Table VII. Difference Between 3-on-3 and 5-on-5 basketball
4.6 Multidimensional approach to OE

The last way of determining OE is the multidimensional approach (Cameron, 1978). That OE is an all-in-one approach comprising goal, internal processes, systems resources, multiple stakeholders and competing values models (Madella et al., 2005; Rocha and Turner, 2008; Nowy et al., 2015). In the first study, Madella et al. (2005) examined national swimming federations and reported that OE was due to multiple factors – human resources, finances, communication, partnerships and inter-organizational relations, volume and quality of services and athlete’s international performances. In another study, Rocha and Turner (2008) examined intercollegiate athletic programs and concluded that athletic achievement, graduation rates, social and FP were the key contributors to OE. The researchers surveyed 241 coaches from NCAA division I universities and also reported that coaches’ commitment and citizenship behaviors were insignificant in predicting the OE of athletic departments. Finally, Nowy et al. (2015) evaluated the differences in OE of 1,640 non-profit and 732 for-profit sport organizations in German using an online surveys. The results indicate that for-profits outperform non-profits in overall FP with the latter attaching more importance to program quality, employee qualifications and strategies.

5. FY using financial ratios

FY is the cost effective use of the financial resources of a NNSO so as to accomplish its programs and services objectives, as indicated by financial ratios. The origins and uses of financial ratios can be traced back to the need for sound financial management pertaining to credit valuation, the business transactions and negotiations between and amongst lenders, rating agencies and investors. To date various types of financial ratios have being adopted to assess and measure the overall financial efficiencies of NNSOs to detect the efficient use or misuses of revenues, donations and other monetary resources. In a competitive, resource scarce environment, the uses, applications and value of financial ratios have evolved to be the premier FY measure – both for-profit and NNSOs. The contribution of financial ratio analysis theory in this area is significant. Previous studies indicate that the uses and applications of financial ratios to ascertain FY have the following advantages: simplification of complex financial data, enabling easier comparison, easing trend analysis and highlighting important financial information (Trussel and Greenlee, 2004; Zietlow et al., 2011; Winand et al., 2012). Financial ratios can be classified according to the information they provide and the specific goal of assessment (Greenlee and Bukovinsky 1998). As such, the aim of this study is to utilize financial ratios that are specific to evaluating the financial efficiencies of NNSOs such as program services ratio and support service ratio (Table VIII).

5.1 Program services ratio

Program services ratio measures how a NNSO is efficient at delivering its programs, with the benchmark being lower is better (Equation (2)) (www.demonstratingvalue.org). For instance, a program service ratio of 0.2 or 20 percent is better than 0.9 or 90 percent, as the latter indicates risky and wasteful use of hard-to-get revenues:

\[
\text{Program services ratio} = \frac{\text{Total program services}}{\text{Total revenues}}. \tag{2}
\]

Similar program services ratios have been previously used by Greenlee and Bukovinsky, 1998; Baber et al., 2001; Corder et al., 2013; McLaughlin, 2016; Omondi-Ochieng, 2016). Program services include such expenses as camps, competitions and coaching fees amongst others (Table VIII).
5.2 Support services ratio

Support services ratio measures how a NNSO is efficient at using its supporting services, with the benchmark being lower is better (www.demonstratingvalue.org) (Equation (3)). For instance, a support services ratio of 0.3 or 30 percent is better than 0.7 or 70 percent. The former (30 percent) indicates that the NNSO economizes the use of hard-to-get revenues for its support services:

\[
\text{Support services ratio} = \frac{\text{Total supporting services}}{\text{Total revenues}}. \tag{3}
\]

Similar support services ratios have been previously used by Greenlee and Bukovsky, 1998; Baber et al., 2001; Corderoy et al., 2013; McLaughlin, 2016; Omondi-Ochieng, 2016). Such support services include contract labor, equipment rentals and IT support amongst others (Table VIII).

5.3 Net income

Net income is also known as net profit and measures the amount of total revenue that exceeds total expenses, and given as follows (www.myaccountingcourse.com):

\[
\text{Net income} = \text{Total revenues} - \text{Total expenses}. \tag{4}
\]

Net income measures how efficient the company is at producing profits, with higher profits almost always preferable and is also used by donors, creditors and the board
members to gauge the financial position and ability to efficiently managed assets. The advantages of a NNSO having a positive net income is that it can be used to offset loans, initiate or improve programs and services, save for future emergencies and/or add additional permanent professional staff (www.myaccountingcourse.com/financial-ratios/net-income).

5.4 Return on assets (ROA) ratio
ROA, also known as asset utilization ratio, is commonly used as a profitability ratio that measures the net income produced by total assets during a period — by comparing net income to average total assets (www.myaccountingcourse.com/financial-ratios/return-on-assets). However, it also increasingly applied in measuring how efficient an organization can generate revenues or produce profits from using its assets. The ratio can help managers and stakeholders to evaluate how well the organization converts its investments in the form of assets into revenues or profits. In short, the ratio measures how efficient an organization utilizes its assets to gain a net profit — with a higher ratio being better. For instance, a ROA of 0.8 or 80 percent is excellent compared to a 10 percent. Depending on the size of the NNSO, assets may include: administrative offices, cars, training facilities such as gym and fields, stadium and office furniture amongst others (Table IX). ROA has been previously used in the following studies (Dimitropoulos, 2010; Winand et al., 2012; Ecer and Boyukaslan, 2014; Sakinç, 2014).

6. Methodology
This section contains data sources, measurement variables (dependent and independent) and the case study approach.

6.1 Data sources
This study used archival data from audited financial reports and Form 990 sourced from www.teamusa.org/USA-Triathlon/About/USAT/Financial-Information for the period 2010–2015. Audited financial reports are examinations of an entity’s financial statement and accompanying disclosures by an independent auditor. From the audited reports,
the author examined the following statements: statement of financial position, statement of activities and changes in net assets, and the statement of cash flows to access the financial health of UST. Form 990 is an Internal Revenue Service form that is filed by tax exempt organizations and is intended to give the government and the public a clearer picture of the organization’s activities annually. Form 990 also had information pertaining to mission, number of employees, expenses, revenues and assets.

6.2 Measurement variables
The study variables were divided into two categories – dependent variables and independent variables. Dependent variable was FP measured as net profits from 2010 to 2015. Independent variables were FE (quantified as annual total asset and total revenues) and FY calculated as program services ratios and support services ratios over the same period.

6.3 Case study method
According to Hancock and Algozinne (2016), Yin (2017) and Tight (2017), in the case study method, the findings are the basis of the data collected with a focus on the unique features of a particular individual and/or organization. The authors further add that the advantages of the case study method are: suitability in researching a unique phenomenon, in this case financial management of a single organization; effectiveness and reliability as its biasness provides intuitive and insinuated findings; it fully depicts the depth of particularities within an organization; and it is often done to make practical improvements. However, the authors also add that disadvantages of case study method may include lack of generalizability to larger populations, time consumption and that it represents depth of information, rather than breadth.

7. Results
The following section pertains to the calculated results of FP, FE and FY (Table X).

7.1 FP results
The 2004–2016 FP of UST was measured by net income, showing a high positive result of 2,100,591 on average. The maximum net income was 4,710,005, generated in 2012 and 2011 was the worst year with a loss of −442,528 (Table X and Figure 2).

7.2 FE results
UST was moderately effective in accumulating assets and revenues (Table XI, Figures 3 and 4). Mean total assets was 15,493,726, the organization accumulated a maximum total

<table>
<thead>
<tr>
<th>Year</th>
<th>Net profit</th>
<th>Increments/reductions</th>
<th>Above or below average</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. 2010</td>
<td>593,889</td>
<td>Unknown</td>
<td>Below</td>
</tr>
<tr>
<td>2. 2011</td>
<td>94,328</td>
<td>Negative (−)</td>
<td>Below</td>
</tr>
<tr>
<td>3. 2012</td>
<td>4,710,005</td>
<td>Positive (+)</td>
<td>Above</td>
</tr>
<tr>
<td>4. 2013</td>
<td>9,400,114</td>
<td>Positive (+)</td>
<td>Above</td>
</tr>
<tr>
<td>5. 2014</td>
<td>−442,528</td>
<td>Negative (−)</td>
<td>Below</td>
</tr>
<tr>
<td>6. 2015</td>
<td>−1,752,260</td>
<td>Negative (−)</td>
<td>Below</td>
</tr>
</tbody>
</table>

Minimum | −1,752,260 |
Maximum | 4,710,005 |
Mean | 2,100,591 |

Note: Currencies in US$

Table X. Financial performance results (2010–2015)
assets of 22,443,737 in 2014 and the lowest total assets was 8,043,981 – occurring in 2010. Total revenues were above average in four of the six years analyzed – indicating effective revenue generation.

### 7.3 FY results

FY was measured in three ways – program services ratio, support services ratios and ROA ratio. UST had inefficient program services provisions at 77 percent average but high support service efficiency with a mean of 18 percent. The organization was extremely efficient at converting assets to revenues with an average ROA of 14 percent (Table XII, Figures 5 and 6).

### 8. Discussions of managerial and policy implications

This paper examined the FP of UST using FE indicators and FY ratios, for the period 2010–2016. 

FP was calculated by net income as common in past studies (Greenlee and Bukovinsky, 1998; Dimitropoulos, 2010; Ecer and Boyukaslan, 2014; Omondi-Ochieng, 2016). The net average income was high and positive at 2,100,591, with two years out of the

---

**Table XI. Financial effectiveness results (2010–2015)**

<table>
<thead>
<tr>
<th>Year</th>
<th>Total assets</th>
<th>Increments or reductions</th>
<th>Above or below average</th>
<th>Total revenues</th>
<th>Increments or reductions</th>
<th>Above or below average</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. 2010</td>
<td>8,043,981</td>
<td>Unknown</td>
<td>Below</td>
<td>11,124,451</td>
<td>Unknown</td>
<td>Below</td>
</tr>
<tr>
<td>2. 2011</td>
<td>8,213,996</td>
<td>Positive (+)</td>
<td>Below</td>
<td>11,814,514</td>
<td>Positive (+)</td>
<td>Below</td>
</tr>
<tr>
<td>3. 2012</td>
<td>11,130,687</td>
<td>Positive (+)</td>
<td>Below</td>
<td>15,383,120</td>
<td>Positive (+)</td>
<td>Above</td>
</tr>
<tr>
<td>4. 2013</td>
<td>21,708,928</td>
<td>Positive (+)</td>
<td>Above</td>
<td>20,632,817</td>
<td>Positive (+)</td>
<td>Above</td>
</tr>
<tr>
<td>5. 2014</td>
<td>22,443,737</td>
<td>Positive (+)</td>
<td>Above</td>
<td>15,126,242</td>
<td>Negative (-)</td>
<td>Above</td>
</tr>
<tr>
<td>6. 2015</td>
<td>21,421,028</td>
<td>Negative (-)</td>
<td>Above</td>
<td>15,423,893</td>
<td>Positive (+)</td>
<td>Above</td>
</tr>
</tbody>
</table>

Minimum = 8,043,981
Maximum = 22,443,737
Mean = 15,493,726

Minimum = 11,124,451
Maximum = 20,632,817
Mean = 14,917,473

**Note:** Currencies in US$. **Source:** UST, Independent Audited Reports, 2010–2015
six above average. Year 2012 was the most profitable year with 4,710,005 and 2015 had the worst loss of \(-1,752,260\). Overall, the FP of UST as gauged by net income was moderate but turbulent with two of the six years experiencing losses.

FE results can be viewed from two fronts, as the ability of UST to assemble needed assets and generate additional revenues – measured as total assets and total revenues – collectively also known as systems resource effectiveness (Koski, 1995;
### Table XII.

<table>
<thead>
<tr>
<th>Year</th>
<th>PSR</th>
<th>Increases or reductions</th>
<th>Above or below average</th>
<th>SSR</th>
<th>Increases or reductions</th>
<th>Above or below average</th>
<th>ROA</th>
<th>Increases or reductions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. 2010</td>
<td>0.74</td>
<td>Unknown</td>
<td>Below</td>
<td>0.21</td>
<td>Unknown</td>
<td>Above</td>
<td>7.38</td>
<td>Unknown</td>
</tr>
<tr>
<td>2. 2011</td>
<td>0.80</td>
<td>Positive (+)</td>
<td>Above</td>
<td>0.19</td>
<td>Negative (−)</td>
<td>Above</td>
<td>1.14</td>
<td>Negative (−)</td>
</tr>
<tr>
<td>3. 2012</td>
<td>0.89</td>
<td>Negative (−)</td>
<td>Below</td>
<td>0.15</td>
<td>Negative (−)</td>
<td>Below</td>
<td>42.3</td>
<td>Positive (+)</td>
</tr>
<tr>
<td>4. 2013</td>
<td>0.54</td>
<td>Negative (−)</td>
<td>Below</td>
<td>0.12</td>
<td>Negative (−)</td>
<td>Above</td>
<td>43.3</td>
<td>Positive (+)</td>
</tr>
<tr>
<td>5. 2014</td>
<td>0.81</td>
<td>Positive (+)</td>
<td>Above</td>
<td>0.21</td>
<td>Positive (+)</td>
<td>Above</td>
<td>−1.97</td>
<td>Negative (−)</td>
</tr>
<tr>
<td>6. 2015</td>
<td>1.06</td>
<td>Positive (+)</td>
<td>Above</td>
<td>0.19</td>
<td>Negative (−)</td>
<td>Below</td>
<td>−8.18</td>
<td>Negative (−)</td>
</tr>
</tbody>
</table>

**Notes:** PSR, program service ratio; SSR, support services ratio; ROA, return on assets. Currencies in US$.  
**Source:** UST, Independent Audited Reports (2010–2015)
Papadimitriou, 2002; Omondi-Ochieng, 2014). Average total assets were 15,493,726. However, total revenues mostly appreciated with an average of 14,917,473, peaking at a maximum of 20,632,817 in 2013. Overall, the FE of UST—a measure gauged by asset accumulation and revenue generation—was both moderate and high, respectively.

FY results were examined using program service ratio, support service ratios and ROA as commonly used in previous studies (Greenlee and Bukovinsky, 1998; Baber et al., 2001; Panagiotis, 2009; Hamil and Walters, 2010; Mathieu et al., 2012). UST, on average, spent over 77 percent of its revenues on programs, with a minimum of 54 percent in 2013, and a maximum of 81 percent in 2014, respectively. UST was more efficient on support services as indicated by a minimum of 12 percent in 2013 and an average of 18 percent. However, the organization had very good asset utilization efficiencies with a mean ROA of 14.0 percent—indicating excellent management. Overall, USC had high program services inefficiencies and a very high ability to covert assets to revenues—the former of which may require cost cutting and possible use of volunteers in program and services provision (Omondi-Ochieng, 2014; Hoeber et al., 2015).

In sum, most NNSOs have neglected the combined uses of effectiveness and efficiency indicators by narrowly focusing on international performance and Olympic medals (Koski, 1995; Madella et al., 2005; Bayle and Robinson, 2007). Although FP is of interest to NNSOs, it is increasingly becoming of particular interest to managers who must address multiple concerns of stakeholders, public and private donors and fans who demand international recognition from winning Olympic medals (Bayle and Robinson, 2007; Balduck, 2009). Moreover, non-profit sports organizations are always competing against other private entities with bigger budgets and offering similar services and programs (Chelladurai and Haggerty, 1991; Claessens et al., 2014). Moreover, in a difficult economic climate, NNSOs are often faced by constant thorny dilemmas: fierce competition, shrinking budgets, yet they are still expected to produce positive results (Frisby, 1986; Cordery et al., 2013). Essentially NNSOs have two options: either to reduce costs or increase FE and FY. In reality, however, no NNSO can offer all services and programs that they wish or their clients want. However, achieving revenue growth and general long-term growth would be overall performance enhancement, within the limitations of human and financial resources (Omondi-Ochieng, 2013, 2016). Such organizations may therefore need to continuously engage in marketing activities in order to attract and retain customers. Sometimes NNSOs may seem effective due to favorable climate. For instance years prior to the Olympics, NNSO tend to receive increases in revenues (Table XIII).

<table>
<thead>
<tr>
<th>Problem</th>
<th>Possible solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. High cost of human capital</td>
<td>Use of more volunteers</td>
</tr>
<tr>
<td></td>
<td>Cut salaries</td>
</tr>
<tr>
<td>2. High cost of program services</td>
<td>Cut “underperforming” programs</td>
</tr>
<tr>
<td></td>
<td>Price/promotion offers</td>
</tr>
<tr>
<td>3. High costs of support services</td>
<td>Reduce R&amp;D and marketing budget</td>
</tr>
<tr>
<td></td>
<td>Partnerships with other NPOs</td>
</tr>
<tr>
<td>4. General inefficiency</td>
<td>Cost cutting by selling idle buildings</td>
</tr>
<tr>
<td></td>
<td>Outsourcing and redundancies</td>
</tr>
<tr>
<td>5. General ineffectiveness</td>
<td>Leasing instead of building</td>
</tr>
</tbody>
</table>

*Note:* Poor financial performance may also be rooted in embezzlement, scarcity, corruption, etc.  
*Sources:* Koski (1995), Madella et al. (2005), Bayle and Robinson (2007), Balduck (2009), Winand et al. (2014) and Omondi-Ochieng (2016)  
*Table XIII.* Possible solutions to poor financial performance
9. Conclusion and research implications

FP is fundamental to management planning and control activities and accordingly have received considerable attention by both management practitioners and sports theorists (Panagiotis, 2009; Winand et al., 2014; Omondi-Ochieng, 2016). The present study aimed to evaluate the FP of UST from 2004 to 2015 based on FE and FY using a case study method. FE and efficiency are central terms for assessing and measuring the FP of NNSOs such as UST. Despite the value of assessing and measuring overall FP, the present study indicated the difficulty of achieving a balance between being both financially efficient and financially effective simultaneously. The study offers three important lessons.

First, the study demonstrates that UST was a high financial performer (average positive net income of 2,100,591) and was also moderately effective in accumulating assets and generating revenues (average 14,917,473 per year). Most NNSOs focus too much on fundraising and tend to neglect organic growth through efficient service and program delivery (Baber et al., 2001; Baruch and Ramalho, 2006; Balduck, 2009). UST particularly faces the problem of costly inefficient programs which further reduce net incomes. One possible solution is to use volunteers to offset program costs (Table XIII).

Second, the study provides evidence that improving overall FP requires extraordinary managerial capabilities based on sound organizational policies directed at prudent financial practices. Efficiency involves financial discipline and control over operations and working capital requirements (Bull, 2007; Ecer and Boyukaslan 2014; Omondi-Ochieng, 2016), whereas effectiveness requires the NNSO ability to develop their own strategies for sustainable growth, in a manner that can differentiate themselves and be creatively innovative, especially focused on revenue generation (Wemmer et al., 2016; Winand and Anagnostopoulos, 2017). Nevertheless, non-profit organizations can only sustain their operations if revenues far exceed expenses (Omondi-Ochieng, 2016). NNSO therefore need to see efficiency as a necessary, but not sufficient condition and to consider effectiveness not just as an output but as a continuous process of resource acquisition.

Finally, this research outcome could stimulate a research agenda in three themes: first, imperial investigation is needed as to how NNSO perceive or define their performance. Are performance standards dictated by US Olympic committee, funders or stakeholders? Second, there is a need to learn more if NNSO abide by or comply with efficiency requirements possibly set by themselves or by funders. In other words are NNSOs required to be financially efficient? If so by who and to what extent? For example, for every tax dollar allocated by the government, what percentage needs to go into services and programs? If so who decides on the amount? How do NNSO know that they are financially efficient? Do the NNSOs prefer the use of financial ratios as indicators of FY? Lastly, is the need to improve our understanding about why most NNSOs are ineffective? Is it that they do not see the need? Or is it because regulatory, legal or policy mandates for them to do so. Or is it that they are faced with too many financial constraints such as depending almost entirely on donation and handouts. Apart from the need for managerial effectiveness, we can also pose the question of who will discipline the management for poor FP. The research did not consider off-field factors that may influence on-field performance on the national teams managed by UST.

10. Research limitations

The study did also have its limits. First, NNSOs tend to receive direct government services which may falsely indicate that the organization is efficient (Chelladurai, 1987; Bayle and Robinson, 2007). Moreover, some donors may also restrict the uses of their monies to certain services or programs, thereby preventing the proper productive allocations of such funds (Baber et al., 2001; Baruch and Ramalho, 2006; Cordery et al., 2013). Moreover, NNSOs often have strategic objectives that are intangible and challenging to measure as they are shaped
by the multiple expectations of public stakeholders – which may further constrain finances (Lim et al., 1994; Rocha, and Turner, 2008; Musso et al., 2016). Human resources include both paid and volunteers – all making their internal functioning less clear compared to that of a private business (Papadimitriou, 2002; Omondi-Ochieng, 2017). Another research issue generally with NNSOs is that they only avail short-term data to the public, with majority of sports organizations still do not have their financial information publicly accessible. If and when the financial information is available, most are usually disorganized, unclear and too short for longitudinal research. Despite these potential drawbacks, the researcher made all efforts to obtain audited financial reports from the organization and from the website www.guidestar.org/, which offers mostly free accurate and updated financial information of thousands of non-profits. As NNSOs start striving to be effective, we also have to bear in mind that financial ratios are not the only way of measuring success. Financial ratios may also have other possible disadvantages such as: there could be differentials in operating environments due to regulations and market structure, they may be affected by estimates and assumptions based on different accounting policies and they are usually based on past information which my neglect current and future information (Bull, 2007; Zietlow et al., 2011; Omondi-Ochieng, 2017).

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Performance measurement and management systems as IT artefacts

Characterising, contextualising and valuing their effective use in SMEs

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Université du Québec à Trois-Rivières, Québec, Canada

Abstract

Purpose – Considering performance measurement and management systems (PMMS) to be “mission-critical” information systems for many business organisations, calls have been made for researchers to shift from studying the use of such systems to studying their “effective” use, and in so doing to focus on their characterisation as information technology (IT) artefacts. The paper aims to discuss this issue.

Design/methodology/approach – In seeking to answer these calls, the authors apply Burton-Jones and Grange’s theoretical framework to study the dimensions, contextual drivers and benefits of the effective use of PMMS. This is done through a field study of 16 PMMS artefacts as used in small- and medium-sized enterprises (SMEs).

Findings – In characterising, contextualising and valuing the effective use of PMMS, this study provides answers to the following questions: What constitutes the effective use of PMMS? What are the user, artefactual and task-related drivers of such use? And what are the benefits for SMEs of using performance measurement and management (PMM) systems effectively?

Practical implications – With regard to the design of a PMMS artefact, the findings imply that one should concentrate on those artefactual attributes that most enable informed action on the part of owner-managers, as it is these actions have the greater consequences for the realisation of IT business value in SMEs. Moreover, the nomological network resulting from this research provides the theoretical and methodological underpinnings of a diagnostic tool meant to develop the PMM function in SMEs.

Originality/value – This study provides further empirical grounding and understanding. This study provides further empirical grounding and understanding of the concept of effective use, as well as further applicability and actionability to this concept and to the nomological network of its dimensions, contextual drivers and benefits in the case of PMMS and in the context of SMEs.

Keywords SME, IT artifact, Information system, Managerial performance, Competitive performance, Effective use, Performance measurement and management system

Paper type Research paper

1. Introduction

In a globalised knowledge-based economy, business enterprises must now attain a level of organisational performance such that they can compete on a worldwide basis (Busco et al., 2008), including a growing number of small- and medium-sized enterprises (SMEs) in the industrial and manufacturing sectors (Costa et al., 2017). Seeking to improve their competitive performance, many of these SMEs enable their organisational capabilities for innovation, internationalisation and knowledge management by their use of information technology (IT) artefacts (Hagsten and Kotnik, 2017). In this context, such artefacts may be essentially defined as the application of IT to support some managerial, administrative or operational task(s) (Benbasat and Zmud, 2003).

Now, one type of IT artefact is deemed critical to support SME owner-managers in achieving such a “world-class” status for their organisation, namely performance measurement and management systems (PMMS) (Garengo et al., 2005). This artefact is
defined as an IT-enabled information system (IS) whose design is founded upon a comprehensive view of organisational performance, and whose aim is to support executive decision-making and strategic management by producing information that reflects the organisation’s performance logic (Hall, 2014; Marchand and Raymond, 2008). The PMMS artefact may be acquired by a SME in the form of pre-built or “packaged” software, or it may be “custom” developed by the firm internally or with the help of outside consultants (Poba-Nzaou et al., 2014).

The need for a better conceptualisation, contextualisation and explanation of the use of PMMS and a better comprehension of their role in the organisation has also been expressed by researchers in the performance measurement and management (PMM) field (De Toni and Tonchia, 2001; Franco-Santos et al., 2007; Micheli and Mari, 2014). The goal of such research is to produce results that are not only valid theoretically but also useful practically for the design, use and management of PMM systems (Dekker et al., 2013; Evans, 2004; Garengo et al., 2005; Franco-Santos et al., 2012). Moreover, calls have been made in the IS research field to shift from the study of the use of IT artefacts to the study of their “effective” use, observing that the complexity of many organisational situations with regard to IT artefacts and their use was not accounted for in previous IS usage studies (Grover and Lyytinen, 2015) and in PMMS usage studies in particular (Melnyk et al., 2014). Given the rather limited implications of these studies for both PMM and IS theory and practice, the need for a better conceptualisation, contextualisation and explanation of the use of IT artefacts has been expressed by a number of researchers (e.g. Burton-Jones and Grange, 2013; Hsieh and Wang, 2007).

Given the preceding considerations, the aims of this study are both descriptive and explicative, that is, to characterise the extent to which PMM systems are used effectively by SMEs and to identify the principal antecedents and performance outcomes of such use. Thus arise the following research questions:

RQ1. What constitutes the effective use of PMMS?

RQ2. What are the user, artefactual and task-related drivers of such use?

RQ3. What are the benefits for SMEs of using PMM systems effectively?

2. Theoretical background

The ambiguity that surrounds the notion of system usage in the IS research domain is a source of problems with regard to the conceptualisation and operationalisation of this notion (Straub et al., 1995). An inappropriate or inadequate conceptualisation will not provide the contextualisation required to fully understand the usage phenomenon under study, and will produce mixed results that are difficult to interpret and may lead to erroneous conclusions, particularly when dealing with complex ISs such as PMMS (Boudreau and Seligman, 2003; Jain and Kanungo, 2005). Moreover, an inappropriate or inadequate measurement of IS use founded upon superficial indicators (e.g. duration and frequency of use) that neglect task-related aspects, or upon binary variables (0: non-use, 1: use) or proxies (adoption vs use) will not reveal the true nature of the use of a complex IT artefact such as a PMMS (Burton-Jones and Straub, 2006; Silvi et al., 2015).

This measurement problem may indicate a conceptualisation of IS usage that lacks contextualisation or assumes use contexts to be interchangeable. Limiting the explanatory power of contextual elements would then limit our comprehension of the PMMS usage phenomenon. With regard to the IT artefactual context in particular, one could even say that such reductionist approaches assume that all IT artefacts such as PMMS are alike or that their attributes have no importance in understanding their use. A judicious choice of usage variables and measures is thus necessary, if the researcher is
to relate an IS’s attributes to the performance of the task supported by this system (Devaraj and Kohli, 2003).

Now, the problem is particularly serious for PMM systems as used in SMEs because each SME is a case in point, with its own performance logic (Raymond et al., 2013), and a PMMS must be aligned with this logic to provide the necessary information on the firm’s success factors and thus help maintain the firm’s competitive advantage (Marchand and Raymond, 2008). In studying the use of a PMMS artefact in a SME, an underdeveloped conceptualisation and measure may produce an erroneous assessment of the artefact’s business value (Micheli and Mari, 2014). Situating the PMM system “in context” allows one to assess its capacity to represent the “real world” of the organisation, and thus evaluate these systems in an appropriate manner (Uwizeyemungu and Raymond, 2009).

Given the problems commonly associated with demonstrating the benefits of PMM (St-Pierre and Raymond, 2004) and the lack of consensus with regard to the actual performance impacts of PMMS (Baird, 2017), Micheli and Mari (2014) have drawn attention to the underdevelopment of the “performance measurability” concept, and to the measurement processes that ensue from it. In addition to ontological and epistemological considerations on the act of measuring as such, these authors’ questionings imply practical considerations on the tool developed to carry out this measurement, i.e. the PMMS artefact, and on the manner in which this tool is used. Measuring is an epistemic act, that is, one seeks to know something, and this epistemic act should be viewed from a relativist and pragmatic perspective (Mari, 2003). As advocated for the measurement of organisational performance, the pragmatic or situational perspective implies that the PMMS should be founded upon a model that is relevant to the “reality” represented, and that enables the achievement of organisational goals while being readily accessible, easy to use and affordable (Lorino, 2002; Lorino et al., 2017). Moreover, this perspective favours action as it situates the system in context and takes account of its usage contingencies (Micheli and Mari, 2014).

Complex ISs such as PMMS rest upon multiple elements and inter-related IT processes capable of integrating, within a logical ensemble, the firm’s operational and managerial processes across its various business functions (Boudreau and Seligman, 2003). These systems are called upon to evolve with the needs of users whose type and level of competency differ (Jain and Kanungo, 2005). For this reason, the study of complex IS use should be founded upon approaches that allow one to encompass the full range of the phenomenon in its specific context (Hsieh and Wang, 2007), and as the habitual constructs and measures of IS usage do not allow one to understand the cases where there is a lack of appropriation of the system by users, where there is unexpected use of the system, where the system is under-used, and where its expected benefits are not realised (Burton-Jones and Straub, 2006).

The need for a richer conceptualisation and measurement of complex IS use is now well-recognised by researchers, in particular when this use is meant to support users in “cognitively engaging tasks” (Burton-Jones and Straub, 2006). By taking into account critical contextual elements such as the nature of use, its extent, its quality and the user’s expectations, one should attain a better understanding of a complex IS such as a PMMS, of its impacts and of the value or benefits realised from its use (Frutuoso Braz et al., 2011). This is borne out in a number of empirical studies where, in order to face a diversity of complex systems in a large number of organisations, ISs use, and PMMS use in particular, is not primarily approached from its technological aspects but rather from its teleological aspects such as its support of the firm’s management, strategy and decision making (e.g. Lisi, 2015).

Reflecting the different approaches that have been taken to solve these problems of conceptualisation and operationalisation, many definitions of IS use or ancillary
concepts can be retraced in the literature. This includes, for instance, the following concepts: cognitive absorption (a state of deep involvement with software) (Agarwal and Karahanna, 2000, p. 665); user competence (the user’s potential to apply technology to its fullest extent so as to maximise performance of specific job tasks) (Marcolin et al., 2000, p. 38); quality of use (one’s ability to correctly exploit the appropriate capabilities of software in the most relevant circumstances) (Boudreau and Seligman, 2003, p. 3); IS continuance (behavior patterns reflecting continued use of a particular IS) (Cheung and Limayem, 2005, p. 472).

Notwithstanding the previous research efforts, the use of complex IS remains a phenomenon that is still lacking in characterisation, explanation and contextualisation. Now, in view of the definition of PMMS given above, these systems are considered to be complex. And because of their strategic or “mission-critical” nature, PMMS are highly contextualised (Bourne et al., 2013). While there have not been many empirical studies on the subject of PMMS use, be it in SMEs or in large enterprises, it appears that this use is continuous in nature, focussed on the system’s informational content, and influenced by the management style and culture of the organisation (Bourne et al., 2000).

3. Research model
Being part of a network of influences, PMMS usage can be theorised as a context-bound independent or dependent construct integrated in a nomological network (Benbasat and Zmud, 2003). In seeking to provide added validity and relevance to the concept of IS use, we applied Burton-Jones and Grange’s (2013) theoretical framework to study the dimensions, contextual drivers and benefits of the effective use of PMMS in SMEs, as synthesised in the research model presented in Figure 1.

One should note at this juncture that the theoretical foundations of Burton-Jones and Grange’s (2013) effective use framework rest primarily upon representation theory (Wand and Weber, 1995; Weber, 2003), wherein representations of reality (to the extent that they are “faithful”) enable action and thus constitute the essence of any IS. From this theoretical perspective, a complex IS such as a PMMS must be able to represent the real world (and its phenomena) through features that allow its users to build their own representation of this world, and whether this reality is objective or socially constructed (Wand and Weber, 1993). Systems that provide representations allow their users to

![Figure 1. Research model]
faithfully track the state and state changes of other systems such as the organisation or the business environment (Weber, 2003). Moreover, the representation of a real-world phenomenon avoids the cost of having to directly observe the phenomenon in question (Wand and Weber, 1993). Representation systems provide access to phenomena that are difficult to apprehend, impossible to follow directly or that do not yet exist (Weber, 2003). And the more their representations are “faithful” to the system being represented, the more these systems provide an enlightened basis for action (Weber, 1997). With regards to a PMMS, one would expect that if it provides a faithful representation of the firm’s activities, it will then help users to understand what is being measured and enable them to take action.

The theoretical framework also relies upon affordance theory (Gibson, 1977), through its interest not only in the physical and sensory attributes of the IT artefact’s user-interface (physical and sensory affordance) but also in those attributes that support the user’s cognitive ability (cognitive affordance) and capacity to act in the pursuance of a goal (functional affordance) (Hartson, 2003). Essentially, an affordance is the actor’s perception of the range of actions made possible by an artefact (Gibson, 1979; Norman, 1988). Affordances are determined both by the characteristics of the artefact and by the sensory, motor and mental capacities of the user (Norman, 1988). Hence, for the same IT artefact, affordances will vary across users and usage situations.

Given the theoretical framework presented above, the three aspects to be prioritised are the user, the IS and the task (defined as “goal-directed activity”) (Burton-Jones and Straub, 2006). We thus followed Burton-Jones and Grange’s (2013) approach because we deemed it to be most appropriate to our research aim of characterising and explaining the effective use of PMMS in the context of SMEs, given its encompassing multiple dimensions of effective use and its organising of these dimensions into a coherent ensemble. In reaching beyond the purely artefactual dimension of IS use, this framework incorporates other rarely considered dimensions that are more specifically linked to what happens after the user interacts with the system.

Burton-Jones and Grange’s (2013) theoretical framework also constitutes a basis for the operationalization and measurement of effective use, providing us with the capacity to contextualise a complex IT artefact such as a PMMS in a particularly rich manner, when compared to previous conceptualizations of IS use. In this regard, Burton-Jones and Grange’s theory builds upon, extends and integrates well-known theories and models of IS use, namely Davis’ (1989) technology acceptance model, DeSanctis and Poole’s (1994) adaptive structuration theory, Goodhue and Thompson’s (1995) technology-task fit, DeLone and McLean’s (2003) IS success model and Barki et al. (2007) use-related activity. And in so doing, Burton-Jones and Grange’s (2013) framework is the only one that attempts to simultaneously explain the nature, antecedents and consequences of effective use.

3.1 Effective use of the PMMS artefact

Effective use is defined by Burton-Jones and Grange (2013, p. 633) “as using a system in a way that helps attain the goals for using the system”. This notion is conceptualised as three sequentially related components or dimensions: the physical access to the IS by the user (transparent interaction); the representation of an individual, organisational or environmental reality that the system provides to the user (representational fidelity); and the action envisioned by the user from the system’s representations (informed action) (Burton-Jones and Grange, 2013, p. 642). Transparent interaction is thus viewed as a necessary condition of representational fidelity, which in turn is viewed as a necessary condition of informed action.

As advocated by Burton-Jones and Straub (2006), our research model explicitly relates each dimension of effective use to the aspects involved in the usage of a complex IS: the user, the system itself, and the task meant to be supported. Our ensuing contextualisation of the
effective use of PMMS was based on the findings of previous IS (Burton-Jones and Grange, 2013; Burton-Jones and Straub, 2006; Hsieh and Wang, 2007) and PMM (Garengo et al., 2005; Sharif, 2002) studies.

Transparent interaction with the PMMS (user/system-related). Defined as the “extent to which a user is accessing the system’s representations unimpeded by its surface and physical structures” (Burton-Jones and Grange, 2013, p. 642), this component of the research model reflects the interaction of the SME owner-manager with the PMMS artefact.

Representational fidelity of the PMMS (user/system/task-related). Defined as the “extent to which a user is obtaining representations from the system that faithfully reflect the domain being represented” (Burton-Jones and Grange, 2013, p. 642), this dimension of effective use reflects the perceived quality of the information output by the PMMS in relation to the owner-manager’s task.

Informed action enabled by the PMMS (user/task-related). Defined as the “extent to which a user acts upon the faithful representations he or she obtains from the system to improve his or her state” (Burton-Jones and Grange, 2013, p. 642), this dimension reflects the enablement by the PMMS of the actions required of owner-managers as they strive to maintain and improve their firm’s performance.

Given Burton-Jones and Grange’s (2013) definition and three-dimensional conceptualization of the effective use of an IT artefact, their framework also proposes to explain how such use is meant to improve performance from the user’s perspective. Thus, transparent interaction allows users to interact seamlessly with the PMMS artefact and gain time in the accomplishment of their task. Representational fidelity is meant to reduce the task uncertainty of users by increasing their understanding of the performance domain represented by the PMMS artefact. Informed action allows users to leverage the information obtained from the PMMS, that is, to “informate” their task (Zuboff, 1988). Finally, Burton-Jones and Grange’s (2013) theorisation of effective use is subject to boundary conditions that delimit its application in different user, system and task contexts. For instance, the fact that certain users are more knowledgeable, experienced and motivated than others and that certain systems (such as a PMMS) and certain tasks are more complex and interdependent than others must be accounted for (Burton-Jones and Gallivan, 2007).

3.2 Contextual drivers of effective use of PMMS
In line with Burton-Jones and Grange’s (2013) theoretical framework, all three dimensions of the effective use of a PMMS are expected to be influenced by contextual elements related to the user, to the PMMS artefact he or she uses, and to his or her task as owner-manager of a SME.

User’s education and experience (user-related). SME owner-managers’ socio-demographic attributes such as their age, gender, education and experience have long been known to influence their managerial behaviour (Smith and Miner, 1983). With respect to the use of a PMMS, we expect that owner-managers with the greater general knowledge and greater capacity for analysis, synthesis and abstraction gained from a higher education as well as the greater context-specific knowledge gained from a longer experience in the task and in the work domain will make more effective use of such a complex IS (Raymond et al., 2013).

PMMS artefactual capability (system-related). System usage behaviours are obviously bound by IT artefactual capabilities, i.e. those functional attributes of the IS that determine what can and cannot be done by the user with the system (Wand and Weber, 1995; Hartson, 2003). In the case of a PMMS artefact, we expect its effective use by a SME owner-manager to be primarily driven by two artefactual capabilities (Marchand and Raymond, 2008). The first capability relates to the range of indicators present in the system that allow owner-managers to assess the different aspects of their firm’s
performance in a holistic manner (level of alignment and scope of the PMMS artefact). The second capability relates to the system’s facilitation of the use of the performance information output for managerial decision making and action purposes (management support functionalities of the PMMS artefact).

**User’s extrinsic motivations (task-related).** In an organisational IS context, the user’s extrinsic motivations are based upon his or her perception of the system’s usefulness, this perception resting upon the task-related usage goals defined ex ante by the user (Lowry et al., 2015). Behavioural theories such as the theory of reasoned action and the theory of planned behaviour have been oft-employed in IS research to successfully predict usage behaviours from such motivations (Cheung and Limayem, 2005). In our case, the SME owner-managers’ extrinsic motivations that are meant to predict the effective use of PMMS are based upon the expected usefulness of the system with respect to three primary usage goals, as identified previously in the PMM literature (Bititci et al., 2012; Franco-Santos et al., 2012; Kueng et al., 2001). The first goal assigned by owner-managers to the use of a PMMS is to support their firm’s strategic planning process, the second is to support the SME’s continuous improvement process, and the third is to support its operations management process. We thus postulate that the greater the importance accorded to these goals by owner-managers, the more effective their use of PMMS.

3.3 *Benefits of effective use of PMMS*

The primary benefits of the effective use of PMMS are postulated here to be the organisational improvements obtained by a SME in terms of its managerial (internal) performance and competitive (external) performance. The assumed relationship between PMMS use and performance is based on the findings of previous PMM studies (Evans, 2004; Garengo and Bititci, 2007; Chenhall, 2005) and on IS success/benefits/effectiveness measurement models previously developed and validated by IS researchers (Gable et al., 2008; Seddon et al., 2002; Tallon et al., 2000). Our research model diverges in this regard from Burton-Jones and Grange’s (2013) proposal in that these authors conceptualise the performance benefits of effective use at the individual level (effectiveness and efficiency of the user). Moreover, our research model initially assumes that all three dimensions of the effective use of PMMS will have a positive impact on the SMEs’ attainment of performance benefits.

4. *Research method*

In characterising the use of the PMMS artefact, we adopted a perspective that respects the ontological value of this artefact. A positivist realist posture was thus taken to achieve this aim (Strong and Volkoff, 2010), while simultaneously accounting for the researchers’ presence and involvement *in situ* (Miles and Huberman, 1994).

4.1 *Research design and sampling*

Contextualising the use of an IT artefact in space and time entails a trade-off between explanatory power and theoretical parsimony. The choice of a research strategy that combines scope and depth must account for the complexity of the environmental and organisational contexts while controlling for relevant variables (Robson, 2002). To this effect, using a multiple case study or “field study” strategy in the sense of Boudreau et al. (2001) constitutes an appropriate research strategy as it reduces the study’s contextual dependency and simultaneously favours the transferability and generalisability of its results (Lee and Baskerville, 2003).

The case study’s theoretical sampling criteria were set to clearly identify the PMMS artefact within the firm’s organisational IS (Marchand and Raymond, 2008). As presented in Table 1, 16 SMEs located in different regions of the province of Quebec, Canada,
<table>
<thead>
<tr>
<th>Firm ID</th>
<th>No. of empl.</th>
<th>Age of firm</th>
<th>Sector</th>
<th>PMMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>16</td>
<td>30</td>
<td>Electronics/telecom</td>
<td>Different DBs: accounting/cost, orders, production quality</td>
</tr>
<tr>
<td>B</td>
<td>43</td>
<td>17</td>
<td>Construction</td>
<td></td>
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<tr>
<td>C</td>
<td>70</td>
<td>28</td>
<td>Industrial equipment</td>
<td>Organisation DB: accounting/cost, sales, HRM, production</td>
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<td>D</td>
<td>39</td>
<td>30</td>
<td>Chemical</td>
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<td>E</td>
<td>135</td>
<td>32</td>
<td>Industrial equipment</td>
<td>Different DBs: accounting/cost, CRM, HRM, production, engineering</td>
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<tr>
<td>F</td>
<td>250</td>
<td>43</td>
<td>Chemical</td>
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<tr>
<td>G</td>
<td>55</td>
<td>35</td>
<td>Construction</td>
<td>Different DBs: accounting/cost, clients, production</td>
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<tr>
<td>H</td>
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<td>13</td>
<td>Construction</td>
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<tr>
<th>Firm ID</th>
<th>No. of empl.</th>
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<td>75</td>
<td>34</td>
<td>Industrial equipment</td>
<td>Organisation DB/ERP: accounting/cost, orders, HRM, production</td>
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<tr>
<td>L</td>
<td>130</td>
<td>30</td>
<td>Construction</td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>96</td>
<td>25</td>
<td>Electronics/telecom</td>
<td>Organisation DB/ERP: accounting/cost, sales, HRM, production</td>
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<tr>
<td>N</td>
<td>524</td>
<td>65</td>
<td>Construction</td>
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<td>O</td>
<td>25</td>
<td>25</td>
<td>Chemical</td>
<td></td>
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<tr>
<td>P</td>
<td>40</td>
<td>40</td>
<td>Construction</td>
<td>Industrial equipment Organisation DB/ERP: accounting/cost, sales, production</td>
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<tr>
<td>Q</td>
<td>23</td>
<td>18</td>
<td>Chemical</td>
<td></td>
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<tr>
<td>R</td>
<td>15</td>
<td>17</td>
<td>Construction</td>
<td>Different DBs: accounting/cost, orders</td>
</tr>
</tbody>
</table>

Table I. Characterisation of the sample PMMS as IT artefacts
and showing a variety of contexts in terms of the firms’ size, age and industrial sector were thus selected. To ensure the selection of firms that met the PMMS criteria as well as to provide richness of experiences, phone calls and e-mails were exchanged with the firms’ owner-manager prior to the case interviews.

4.2 Data collection

Both flexible and structured data collection methods were employed, thus allowing for different data types as well as their triangulation and corroboration (Yin, 2003). The user being the individual possessing the most knowledge of the PMMS artefact, employing a methodological approach that encourages the expression of his or her usage experience is necessary. The user is thus asked to present the PMMS artefact he or she uses, and in his or her usage context. It is important to recall at this juncture that when the user’s perspective is not accounted for, one cannot accurately describe nor truly understand the role that usage plays in the configuration of the IT artefact (Orlikowski and Iacono, 2001).

Combining qualitative and quantitative data analyses, we conducted extensive interviews in situ with the SMEs’ owner-manager. This individual’s influence in formulating his or her firm’s strategy and managing its performance is the key to inform these aspects (Spanos and Lioukas, 2001) and consequently to describe the IT artefact dedicated to managing the SME’s performance. The interview was initiated with two open questions: What is your definition of organisational performance as it applies to your firm? In what manner do you measure and manage this performance, and what tools do you employ to do so? The interview then continued with the commented administration of a questionnaire on the PMMS artefact, its use and its performance benefits, in addition to contextual variables.

The interview was audio-recorded and notes were taken throughout its course. These notes as well as the interviewer’s reflective comments were transcribed in the following 24 h (Robson, 2002). Available print documents relating to the PMMS artefact were also collected and examined. Data collection activities were conducted over a 15 month period and carried out in parallel with the data analysis, to allow for necessary adjustments (Robson, 2002).

4.3 Measurement and data analysis

The three components of the effective use of PMMS were ascertained by adapting Burton-Jones and Grange’s (2013) as well as other measures of IS use taken from the extant IS (Hsieh and Wang, 2007; Burton-Jones and Straub, 2006) and PMM (Garengo et al., 2005; Sharif, 2002) literature, through ten linear, numeric scales (transparent interaction with the PMMS, representational fidelity of the PMMS) and five Likert scales (informed action enabled by the PMMS), as presented in Table AI. The two dimensions of the PMMS’ artefactual capability (alignment and scope, management support) were measured, respectively, through 12 and 9 Likert scales based on the range of functionalities found in such systems (Marchand and Raymond, 2008), as presented in Table AII.

In line with previous measurement models of IS success/benefits/effectiveness (Kueng et al., 2001; Chennhall, 2005; Gable et al., 2008), the managerial performance and competitive performance benefits of the effective use of PMMS were assessed, respectively, through five and eight Likert scales adapted from the PMM literature (Evans, 2004; Garengo and Bititci, 2007; Chennhall, 2005). Extrinsic motivations were measured by assessing the importance accorded by the owner-manager to three primary goals of PMMS use, taken from the PMM literature (e.g. Bititci et al., 2012; Franco-Santos et al., 2012). The owner-manager’s level of schooling (high-school, college or university), years as head of the firm (task experience) and years in the firm’s sector of activity (industry experience) were used as measures of the user’s education and experience.
The research questions were addressed with “exact” correlational, variance and regression analyses (Weerahandi, 1995), cluster analysis and Runkel’s (1990) relative frequencies analysis. This last type of analysis aims to find associations between two variables by using the calculus of probabilities, that is, by testing for the interdependence of events through a comparison of the actual relative frequency of joint events to the frequency to be expected if the events were independent of one another. Note that all four types of analysis use statistical strategies that are particularly appropriate for small sample research (Hoyle, 1999).

5. Results

5.1 Characterising the effective use of PMMS

In applying and testing Burton-Jones and Grange’s (2013) framework to characterise the effective use of a PMMS artefact, one must first examine the relationship between the three components of effective use, namely transparent interaction with the artefact (TI), representational fidelity of the artefact (RF) and informed action enabled by the artefact (IA). Now the correlational analysis presented in Table II provides evidence of the sequential nature of this relationship, as postulated by these authors (TI → RF → IA), as TI is shown to be significantly correlated to RF but not to IA, whereas RF is significantly correlated to IA. Moreover, a relative frequencies analysis allows us to determine that the “ease of use” and “completeness” of the information output by the PMMS are the two aspects of its representational fidelity that most benefit from a more transparent interaction with this system. In similar fashion, “fostering the emergence of new ideas” is the key aspect of the informed action enabled by the PMMS artefact that benefits from a greater representational fidelity of this artefact. These initial results thus offer a both novel and confirmatory operationalisation of Burton-Jones and Grange’s (2013) theoretical framework of the dimensions of the effective use of an IT artefact.

5.2 Contextualising the effective use of PMMS

In contextualising the effective use of a PMMS artefact, and given our research questions, we must first identify primary determinants of effective use at the user and artefactual levels, as well as the components of this use (TI, RF and/or IA) that are affected. This first implies an examination of the influence of the user’s education and experience upon his or her effective use of a PMMS, as proposed in the research model (Figure 1). Now the correlational analysis presented in Table III indicates that it is the user’s level of education rather than experience that is associated with a more effective use of PMMS in terms of RF and IA, but not in terms of TI. Here, the capacity to analyse, to synthesise and to transform information into actionable knowledge that is provided to the SME owner-manager by a university education may not be as readily developed solely from experience.

Cluster analysis was used to classify and characterise the 16 PMMS observed in terms of their artefactual capability. A four-cluster solution was most parsimonious, identifying groups of PMMS artefacts that could be clearly distinguished from one another based on the

<table>
<thead>
<tr>
<th>Effective use of PMMS</th>
<th>TI</th>
<th>RF</th>
<th>IA</th>
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<tr>
<td>Dimension</td>
<td></td>
<td></td>
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<tr>
<td>Transparent interaction with the PMMS (TI)</td>
<td></td>
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<tr>
<td>Representational fidelity of the PMMS (RF)</td>
<td>0.46 (0.076)</td>
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<tr>
<td>Informed action enabled by the PMMS (IA)</td>
<td>0.35 (0.188)</td>
<td>0.56 (0.023)</td>
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**Table II.** Interrelationship of the dimensions of effective use
meaningful pattern of relationships among its artefactual attributes (clustering variables) (Sharma, 1996).

As presented in Table IV, a first cluster regrouping four PMMS artefacts (firms B, D, G and R) was labelled operational PMMS. These artefacts are characterised by a weak capability both in terms of alignment and scope and in terms of management support. A second cluster comprised of two PMMS artefacts (A and H) was named managerial PMMS, as these two artefacts are characterised by a high degree of management support. Their information processing capacity assures an average or standard coverage of the firm’s performance domain, and essentially aims to provide information that is easy to use by operational-level managers. The third cluster, regrouping six PMMS artefacts (E, K, L, N, O and Q), was labelled functional PMMS. As these artefacts show a strong degree of alignment and have a wide scope, they allow for a more holistic measurement of performance, i.e. both horizontally (business processes and projects) and vertically (business functions), and both at the operational and strategic management levels. The last cluster comprised of four PMMS artefacts (C, F, M and P), was named organisational PMMS. These artefacts are the ones that show strong capabilities both in terms of alignment and scope and in terms of management support.

The relationship between the four PMMS artefactual capability profiles and the effective use of PMMS is assessed by the analysis of variance results presented in Table V. Here, one first observes that the managerial and organisational PMMS artefact profiles are

<table>
<thead>
<tr>
<th>Table III.</th>
<th>Relationship of the user’s education and experience with effective use</th>
</tr>
</thead>
<tbody>
<tr>
<td>User’s education and experience</td>
<td>TI</td>
</tr>
<tr>
<td>University education</td>
<td>0.14 (0.609)</td>
</tr>
<tr>
<td>Task experience</td>
<td>0.04 (0.888)</td>
</tr>
<tr>
<td>Industry experience</td>
<td>0.02 (0.946)</td>
</tr>
</tbody>
</table>

**Note:** Light grey-shaded cells indicate a significant relationship (exact statistics, n = 16, p < 0.1)

<table>
<thead>
<tr>
<th>Table IV.</th>
<th>Classification of the PMMS on the basis of their artefactual capability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Artefactual profile</td>
<td>Organisational PMMS (CFMP)</td>
</tr>
<tr>
<td>Alignment and scope</td>
<td>Strong</td>
</tr>
<tr>
<td>Management support</td>
<td>Strong</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table V.</th>
<th>Relationship of the PMMS artefactual capability with effective use</th>
</tr>
</thead>
<tbody>
<tr>
<td>PMMS artefactual profile</td>
<td>TI</td>
</tr>
<tr>
<td>Organisational PMMS</td>
<td>0.34 (0.572)</td>
</tr>
<tr>
<td>Functional PMMS</td>
<td>0.00 (0.990)</td>
</tr>
<tr>
<td>Managerial PMMS</td>
<td>1.81 (0.200)</td>
</tr>
<tr>
<td>Operational PMMS</td>
<td>0.15 (0.707)</td>
</tr>
</tbody>
</table>

**Note:** Darklight grey-shaded cells indicate a significant relationship (exact statistics, n = 16, p < 0.05/0.1)
significantly associated to the effective use of the PMMS because they both have a strong management support capability that better enables users to take informed action. A somewhat more surprising result is that the operational PMMS profile is also significantly associated to effective use, here in terms of representational fidelity. A possible explanation would be that the operational orientation of these PMMS artefacts makes for simpler software design (limited number of performance indicators and managerial functionalities) and thus makes it easier to output performance information that is up to date, relevant, complete, easy to use and easy to interpret by their targeted users.

The results of the variance analysis linking users’ extrinsic motivations to their effective use of PMMS are presented in Table VI. Here one finds that when the SME owner-managers’ goal in using a PMMS artefact is to support either or both of their firm’s strategic planning and continuous improvement processes, effective use ensues in terms of the PMMS artefact’s greater representational fidelity. Whereas when the goal is to support operations management, effective use ensues in terms of the better-informed action enabled by this artefact. This last result again comforts the shift of our research attention from the use of an IT artefact to its effective use (Burton-Jones and Grange, 2013), in that it provides a further explanation as to the conditions under which and the manner by which IT-business value is achieved by an organisation that has invested in IT.

5.3 Valuing the effective use of PMMS

As presented in Table VII, the results of two regression analyses relate the three dimensions of the effective use of PMMS (TI, RF and IA) to both the managerial performance and competitive performance benefits of this use, as perceived by the 16 SME owner-managers. The salient finding here is that the realisation of benefits from the use of a PMMS artefact is solely dependent upon the informed action that is enabled by this artefact. While neither transparent interaction with the PMMS artefact nor its representational fidelity were found to have a direct effect upon performance, these two dimensions of effective use would nevertheless have an indirect effect, as one may recall that they are sequentially prerequisite

<table>
<thead>
<tr>
<th>User’s extrinsic motivations (goals of PMMS use)</th>
<th>Effective use of PMMS</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>TI</td>
<td>RF</td>
<td>IA</td>
</tr>
<tr>
<td>Support strategic planning process</td>
<td>0.80 (0.385)</td>
<td>10.90 (0.005)</td>
<td>0.26 (0.620)</td>
</tr>
<tr>
<td>Support continuous improvement process</td>
<td>2.31 (0.151)</td>
<td>3.39 (0.087)</td>
<td>0.35 (0.563)</td>
</tr>
<tr>
<td>Support operations management process</td>
<td>0.22 (0.649)</td>
<td>0.27 (0.613)</td>
<td>6.79 (0.021)</td>
</tr>
</tbody>
</table>

Note: Darklight grey-shaded cells indicate a significant relationship (exact statistics, n = 16, p < 0.050.1)

<table>
<thead>
<tr>
<th>Effective use of PMMS (independent variables)</th>
<th>Managerial performance</th>
<th>Competitive performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transparent interaction with the PMMS (TI)</td>
<td>0.00 (0.381)</td>
<td>1.58 (0.139)</td>
</tr>
<tr>
<td>Representational fidelity of the PMMS (RF)</td>
<td>1.81 (0.774)</td>
<td>1.13 (0.282)</td>
</tr>
<tr>
<td>Informed action enabled by the PMMS (IA)</td>
<td>0.15 (0.637)</td>
<td>2.09 (0.020)</td>
</tr>
</tbody>
</table>

Note: Dark grey-shaded cells indicate a significant relationship (exact statistics, n = 16, p < 0.05)
to informed action. Furthermore, these last results confirm Leonardi’s (2007) view in that it is through informed action that the informational capabilities of an IT artefact are leveraged and thus generate value for the SMEs that have invested in this artefact.

6. Discussion

To summarise our findings, and given our research questions and model, the nomological network that emerged from this initial validation is presented in Figure 2. A first point to be made is that the three dimensions of effective use are indeed hierarchically related, as postulated in Burton-Jones and Grange’s (2013) framework, that is, TI enables RF which in turn enables IA. In accordance with these authors, it thus becomes important to assess each dimension as a function of use rather than as a function of the IT artefact or the user, and to assess the context of use if one aims to theorise and operationalise effective use.

The second point is that informed action was the lone dimension of effective use to have an effect on performance. This finding diverges from Burton-Jones and Grange’s (2013) proposal in that all three dimensions of effective use should have impacted the attainment of performance benefits by SMEs that have invested in a PMMS. Now, this divergence may be due to these authors conceptualisation of performance at the individual level (effectiveness and efficiency of the user), whereas performance was conceptualised in this study at the organisational level (managerial and competitive performance of the SME), albeit as assessed by the owner-manager who is the primary user of the PMMS and is well-placed to make such an assessment (Raymond et al., 2013). It stands to reason however that apart from managerial and competitive performance, the development of the firm’s dynamic capabilities and chief among them its sensing, learning, integrating and coordinating capabilities are most susceptible to benefit from the effective use of a PMMS artefact (Sharif, 2002; Pavlou and El Savy, 2011). We have thus included in the nomological network the development of these two dynamic capabilities as an added value of the effective use of a PMMS.

A third point to be made is that transparent interaction was the lone dimension of effective use not to be influenced by any of the hypothesised user-related, system-related or task-related antecedents. Now, it stands to reason that the firm’s IT resources and capabilities, chief among them its IT infrastructure, are the contextual elements most susceptible to influence its effective use of IT artefacts such as PMMS (Fink and Neumann, 2007). We have thus included in the nomological network, for future research purposes, the SME’s IT infrastructural capability as a potentially enabling factor of the owner-manager’s – and other managers’ – transparent interaction with the PMMS (user, system).

Figure 2. Nomological network emerging from our initial validation of the research model.
interaction with the PMMS artefact, or with any other of the firm’s “mission-critical” IT artefacts for that matter (e.g. ERP).

This study has provided an initial validation of Burton-Jones and Grange’s (2013) “effective use” framework, a framework that offers a conceptualization of IS use by which it is possible to explain IS effectiveness. It has shown the applicability of this conceptualization and indicates that it is indeed possible to empirically capture the three components of effective use proposed by these researchers. This approach is particularly useful for the study of complex organisational IS whose use cannot be reduced to a few generic or proxy variables, limited in their consideration of the specific context of use. Through the broader and deeper characterisation, contextualisation and valuation that it allows, this study contributes to a better explanation of the PMMS usage phenomenon.

In applying Burton-Jones and Grange’s (2013) conceptualization of effective use to PMM systems, we were able to characterize PMMS use through three sequentially ordered dimensions. By thus opening the “black box” of IS use, this approach allowed us to identify the variables that characterize the phenomenon under study in a more valid manner theoretically and in a more useful manner practically. Given the study’s aim, these variables were chosen in view of the nature of PMMS as complex organisational IS. By clarifying and proposing a unified basis for the concepts involved, these variables can contribute to the accumulation and integration of IS and PMM research results into a more coherent body of knowledge.

Our study further demonstrates that Burton-Jones and Grange’s (2013) framework can provide the contextualisation necessary for an in-depth understanding of IS use and consistent results in terms of the impacts of such use, particularly when it comes to complex organisational IS such as PMMS. Thus, considering the diversity of IT artefacts and of the contexts of use of these artefacts, and given our operationalization of this framework through variables that are rooted in the reality of the organisation (performance management task, user, PMMS artefact) rather than being limited to generic or proxy measures, we were able to understand the true nature of PMMS usage and to explain its contextual determinants and performance outcomes. For example, artefactual characteristics (e.g. strong management support) were linked to particular aspects of usage (e.g. informed action), links that more superficial IS use variables would not have revealed. One can foresee that this approach would facilitate the understanding of usage problems, e.g. divergent use or under-use, by investigating for example the prevailing situation with regard to the representational fidelity of the PMMS artefact.

Lastly, our study confirms that Burton-Jones and Grange’s (2013) three-dimensional conceptualization of effective use (TI→RF→IA) provides the opportunity for researchers to observe, in context, a logical transition from the use of a performance management tool to the effects of this use, here from the use of a PMMS artefact to its organisational impacts in SMEs (Kueng, 2000). This provides the researcher with the theoretical means for a deeper understanding of the benefits that complex IS can provide to an organisation, and in particular when the expected benefits of such systems (e.g. improved competitive performance) do not materialize.

6.1 Contribution to theory
Given the results of this study and the theoretical approach taken to analyse PMMS use, its contributions concern both the PMM and the IS research fields. First and foremost, this study has shed new light on – and provided greater understanding of – the nature, extent, drivers and benefits of PMMS use by SME owner-managers. As questions remain unanswered with regard to managers’ use of IT-enabled ISs to measure and manage their organisation’s performance, be it in large organisations, private or public, or in SMEs, our study has provided both an empirically validated conceptual framework, in the form of a
nomological network, and a measurement apparatus that may be employed by researchers to tackle many of these questions.

Our application and operationalisation of Burton-Jones and Grange’s (2013) theoretical framework was found to be initially valid and fruitful in characterising, contextualising and valuing the effective use of PMM systems in SMEs. As many researchers are still preoccupied with the study of complex organisational IS in decision-support roles, such as PMMS, and with the realisation of IT business value from such use, our study contributes to the integration of these research efforts through a conceptualisation and operationalisation of IS use that is adapted to this type of IT artefact (Benbasat and Zmud, 2003). Our conceptualisation and operationalisation of the IT artefactual capabilities included in the research model answer the call for researchers to account for the central position of the IT artefact (or IT materiality) in further attempts to understand why, how and to what effect managers use IT-enabled IS to measure and manage their organisation’s performance (Weber, 2003; Orlikowski and Iacono, 2001).

6.2 Contribution to practice
As the use of PMMS and the performance benefits of such use are not yet well understood (Franco-Santos et al., 2012), and especially in the context of SMEs (Bititci et al., 2012), the results of this study provide conceptual and empirical foundations to improve PMMS practice in this context, for organisations currently using a PMMS or for those planning to use such a system. For instance, with regard to the design of a PMMS artefact, one would concentrate on those artefactual attributes that most enable informed action on the part of owner-managers, as these actions have been shown to have greater consequences for the realisation of IT business value in SMEs.

The study’s findings further indicate that PMM systems possessing strong management support capability, i.e. organisational PMMS and managerial PMMS, better enable informed action and a PMMS artefact that incorporates attributes providing such support (e.g. that “allows for external benchmarking”, that “shows cause-effect links”) will promote a more informed management of performance on the part of SME owner-managers. Furthermore, a simpler PMSS software design, i.e. an operational PMSS with a limited number of indicators and managerial functionalities, would positively influence the managers’ ability to view the performance of their organisation in a holistic manner and thus reduce the risk of unintended consequences resulting from under-informed action. These findings may also be useful for organisations that already use a PMMS and would like to evaluate its business value. Indeed, the three-dimensional conceptualization of effective use provides an expanded frame of reference for such an evaluation, that is, an evaluation whose scope is wider scope and whose depth is greater.

Finally, the nomological network resulting from this research could provide the theoretical and methodological underpinnings of a diagnostic tool meant to develop the PMM function in SMEs, and in particular to evaluate the alignment of the firm’s PMMS with its business strategy and IS strategy.

7. Conclusion
While this field study has some limitations related to the nature of the sample, its results nonetheless provide further empirical grounding and understanding of the concept of effective use, as well as further applicability and actionability to this concept and to the nomological network of its dimensions, contextual drivers and benefits in the case of PMMS and in the context of SMEs. Future research should however add technological, environmental and organisational context-related antecedents to this network, including first and foremost the IT infrastructural capabilities of the organisation. Other consequences of the effective use of PMMS should also be studied, the priority being given to the influence of such use upon the development of the dynamic capabilities that enable SMEs to remain competitive in a global, knowledge-based economy.
References


PMMS as IT artefacts


Appendix 1

<table>
<thead>
<tr>
<th>Transparent interaction with the PMMS</th>
<th>Representational fidelity of the PMMS</th>
<th>Informed action enabled by the PMMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>The PMMS is: simple to use, insures a secure and confidential access, filters the content by user profile (personalised access), is interactive (internet/web technology), is accessible from outside the organisation</td>
<td>The PMMS produces information that is up to date, relevant, complete, easy to use, easy to interpret</td>
<td>Using the PMMS: allows me to verify hypotheses, allows me to better understand my firm's performance, fosters the emergence of new ideas on my part, fosters my interest in measuring and evaluating my firm's performance, fosters my interest in applying appropriate management practices</td>
</tr>
</tbody>
</table>

**Table AI.** Measurement items of the effective use of a PMMS
Appendix 2

<table>
<thead>
<tr>
<th>Alignment and scope</th>
<th>Management support</th>
</tr>
</thead>
<tbody>
<tr>
<td>The PMMS:</td>
<td>The PMMS:</td>
</tr>
<tr>
<td>includes strategic-level performance indicators</td>
<td></td>
</tr>
<tr>
<td>includes operational-level performance indicators</td>
<td></td>
</tr>
<tr>
<td>includes prospective performance indicators</td>
<td></td>
</tr>
<tr>
<td>includes business function performance indicators</td>
<td></td>
</tr>
<tr>
<td>includes business process performance indicators</td>
<td></td>
</tr>
<tr>
<td>measures production quality</td>
<td></td>
</tr>
<tr>
<td>measures production delays</td>
<td></td>
</tr>
<tr>
<td>measures production flexibility</td>
<td></td>
</tr>
<tr>
<td>measures R&amp;D</td>
<td></td>
</tr>
<tr>
<td>measures customer satisfaction</td>
<td></td>
</tr>
<tr>
<td>measures the organisational climate</td>
<td></td>
</tr>
<tr>
<td>measures training and learning</td>
<td></td>
</tr>
<tr>
<td>provides relative measures (trends, ratios, gaps)</td>
<td></td>
</tr>
<tr>
<td>presents information in graphical format</td>
<td></td>
</tr>
<tr>
<td>includes qualitative performance indicators</td>
<td></td>
</tr>
<tr>
<td>shows links between operations and strategy</td>
<td></td>
</tr>
<tr>
<td>shows cause-effect links</td>
<td></td>
</tr>
<tr>
<td>allows for external benchmarking</td>
<td></td>
</tr>
<tr>
<td>interprets content</td>
<td></td>
</tr>
<tr>
<td>allows for the development of scenarios</td>
<td></td>
</tr>
<tr>
<td>formulates recommendations</td>
<td></td>
</tr>
</tbody>
</table>

**Table AII.** Measurement items of PMMS artefactual capability

Appendix 3

<table>
<thead>
<tr>
<th>Managerial performance benefits</th>
<th>Competitive performance benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Using the PMMS has a favourable impact upon:</td>
<td></td>
</tr>
<tr>
<td>the development of the firm’s strategy</td>
<td></td>
</tr>
<tr>
<td>the development of managerial processes overall</td>
<td></td>
</tr>
<tr>
<td>the development of decision-making processes</td>
<td></td>
</tr>
<tr>
<td>the capacity to quickly react to market changes</td>
<td></td>
</tr>
<tr>
<td>the firm’s productivity</td>
<td></td>
</tr>
<tr>
<td>the firm’s productivity</td>
<td></td>
</tr>
<tr>
<td>Using the PMMS improves:</td>
<td></td>
</tr>
<tr>
<td>the capacity to respond adequately to market changes</td>
<td></td>
</tr>
<tr>
<td>the firm’s flexibility</td>
<td></td>
</tr>
<tr>
<td>the capacity to identify market opportunities for products and services</td>
<td></td>
</tr>
<tr>
<td>the firm’s capacity to innovate</td>
<td></td>
</tr>
<tr>
<td>the capacity to focus attention on the firm’s critical success factors</td>
<td></td>
</tr>
<tr>
<td>the alignment of the firm’s resources with its strategy</td>
<td></td>
</tr>
<tr>
<td>the coordination of the firm’s functions, processes and projects</td>
<td></td>
</tr>
</tbody>
</table>

**Table AIII.** Measurement items of the performance benefits of PMMS use

**Corresponding author**

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Experimenting lean dynamic performance management systems design in SMEs

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Abstract

Purpose – The purpose of this paper is to frame the potential benefits of lean dynamic performance management (PM) systems for small and micro-enterprises. Such systems may exploit the entrepreneur’s tacit knowledge and build on managerial competencies, by incorporating individual attributes into organisational routines.

Design/methodology/approach – The paper suggests the use of insight models based on the combination of lean PM tools and system dynamics (SD) modelling. Based on a number of exemplary cases, the paper discusses the potential benefits of these models, in respect to four specific contexts: artisan, new company start-up, established firm and micro-giant company. Related to such contexts, the research identifies: needs or priorities, and obstacles or impediments to pursuing business survival and development.

Findings – The conceptual framework discussed in the paper discloses a quite original empirical basis to outline lean dynamic PM systems that may provide entrepreneurs with a set of key-performance drivers that help them to prioritise action, in each of the four analysed contexts.

Originality/value – Growing interest in adopting lean PM models in small and micro-firms appears in the recent PM literature with research highlighting strengths and shortcomings. However, few attempts have been produced to overcome such limitations, while the adoption of SD is relatively new in supporting lean PM system design.

Keywords System dynamics, Case studies, Entrepreneurial capabilities, Insight models, Lean dynamic performance management, Small and micro-firms

Paper type Research paper

1. A learning-oriented approach to managing small and micro-business sustainable development

Small and micro-enterprises (European Commission, 2003) display distinctive characteristics from the majority of their larger competitors, not only in terms of size (e.g. limited workforce, small customer base, market niche orientation), but also of organisational structure, strategy design and performance management (PM) (Storey, 1994). Entrepreneur’s leadership, personalised management with little devolution of authority, family ownership-management, informal and unstructured PM mechanisms are key characteristics that differentiate the management processes carried out in these firms (Neely et al., 1997).

In particular, such firms are able to compete and survive on the market due to a limited number of competitive advantages linked to critical success factors, such as product quality, innovativeness, distribution promptness (Pekkola et al., 2016). These advantages are mainly based on specific (technical or handcrafted) competencies of the owner/entrepreneur, who usually does not hold significant managerial skills and resources (e.g. management control mechanisms). Therefore, as long as the firm is capable to defend its (technical) competencies on the market, it will be likely to survive with a certain success. However, as many real cases
prove, in the long term, the lack of PM systems may imply a weak understanding of both the impact of current decisions on future growth and on the policies to undertake in order to cope with major changes (Bisbe and Malagueño, 2012). Usually, the deep causes of crises are far from being related to sudden and inescapable events. Rather, they gradually arise as a result of the concurrent action over time of different variables pertaining to the “relevant” business system, which embodies not only the internal boundaries of the firm, but also a wider range of variables belonging to other external sub-systems, e.g. related to the competitive environment (Neely et al., 1995).

Entrepreneurs and other small business key actors should develop their abilities to detect weak signals of change in order to timely cope with possible sources of discontinuity leading to business crises. In this perspective, structural deficiencies of small and micro-firms should not only be primarily related to lack of capital, managerial concepts, technical capabilities and qualified professional management. Entrepreneurs particularly need to better frame the complex system where they operate.

Standard accounting and financial-oriented packages and structured PM systems are usually recommended by both practitioners and scholars as a powerful tool to empower decision makers to prevent and counteract crises (Otley, 1999; Bianchi, 2002). However, although such tools may usefully satisfy specific information needs (e.g. product costing, net-working capital needs), they may not fully help decision makers in selectively detecting patterns of behaviour of relevant variables driving to success or crisis (Tilt, 2010; Nandan, 2010; Maskell and Baggaley, 2004; Mitchell and Reid, 2000; Perren and Grant, 2000).

To foster small and micro-business entrepreneurs’ strategic learning, the adoption of formal – though lean – PM systems may prove to be useful. A lean PM system in small and micro-firms is able to combine the advantage of a structured with a flexible and selective approach. The “lean” attribute is used here in order to characterize a different approach in applying PM to small and micro-firms compared to larger organisations. In fact, such systems may fit with the characteristics of small and micro-firms. They are able to exploit the entrepreneur’s tacit knowledge and to build on their own managerial competencies by incorporating such individual attributes into organisational routines. As a result, the use of lean dynamic PM systems – through insight models – may contribute to improving entrepreneurial capabilities and decision making.

Based on this conceptual background, this paper will: discuss why a lean dynamic PM approach is needed in managing small and micro-firms; frame different small and micro-business contexts and related criticalities for survival and development; and identify the role that lean dynamic PM systems may play to fine-tune the structure and behaviour of portrayed performance drivers and end-results with the specific problems/issues in the different explored contexts.

In addition, the paper will consider the methodological conditions, motivations, challenges and requirements to successfully introduce this approach to small and micro-business management, and how to communicate to entrepreneurs the usefulness of such a tailored approach.

In the last sections of the paper, a number of examples related to real small and micro-business success/failures will be discussed, and the role – in terms of challenges and missed opportunities – played by lean dynamic PM systems in the context will be framed.

2. A dynamic view of PM: a perspective to build on entrepreneurial capabilities in small and micro-firms

Dynamic PM is an approach that enables entrepreneurs and business key actors to frame the causal mechanisms affecting organisational results over time. Such a field of research and practice is based on two converging methods of enquiry: system dynamics (SD) modelling and PM (Bianchi, 2016; Cosenz and Noto, 2016; Barnabé, 2011).
Dynamic PM takes its own premises from the literature that has demonstrated the lack of relevance of conventional financially focussed PM systems (Franco-Santos et al., 2012; Kaplan and Johnson, 1987). Such systems are no longer able to provide information that can support: the management of dynamic complexity, measurement of intangibles, detection of delays, understanding linkages between short and long term, and setting proper system boundaries in strategic planning. In order to cope with such problems, to provide decision makers with proper lenses to interpret such phenomena, to understand the feedback structure underlying performance, and to identify alternative strategies to change the structure for performance improvement, SD modelling has been used to support an understanding of: how end-results can be affected by performance drivers; how performance drivers can, in turn, be affected by the use of policy levers aimed to influence strategic resource accumulation and depletion processes; and how the flows of strategic assets are affected by end-results.

Figure 1 illustrates how the end-results provide an endogenous source in an organisation to the accumulation and depletion processes affecting strategic resources. In fact, they can be modelled as in- or outflows, which change over a given time span the corresponding stocks of strategic resources, as a result of actions implemented by decision makers. For instance, liquidity (strategic resource) may change as an effect of cash flows (end-result); and image and credibility of an organisation towards customers (strategic resource) may change as an effect of their satisfaction (end-result). There also are interdependencies between different strategic resources: image may affect the capability of an organisation to get funds from different stakeholders. Furthermore, both image and financial resources may affect its capability to recruit skilled human resources and keep them (Bianchi, 2016).

Organisational growth can be sustainable if the rate at which end-results change the endowment of corresponding strategic resources is balanced (Bianchi, 2016). End-results can be measured over a sequential chain and positioned on several layers. “Last layer” end-results are those changing the endowment of strategic resources that cannot be purchased in the market. To affect the results positioned on this “last layer”, further layers must be identified. For example, cash flows can be affected by the current income and net-working capital flows. These more detailed financial measures are, in turn, affected by

![Figure 1. A dynamic view of performance management](image-url)
non-monetary end-results. So, activity volumes affect revenues and the net-working capital flow. They also affect purchase volumes, which impact on purchase costs and (through purchases on credit and the change in inventory) on the net-working capital flow. Therefore, activity volumes can be located on the first layer of end-results. Such results can be affected by performance drivers.

The literature and practice on SD applied to strategic management has developed a complementary approach to dynamic PM, implying the study of the dynamic conditions leading an organisation to build up and defend its competitive advantage over time (Cosenz and Noto, 2016). Such an approach has been defined as dynamic resource-based view (RBV).

Previous studies adopting a dynamic RBV of organisations have confirmed that the management of strategic resources, and more specifically the maintenance of an appropriate balance between such assets, is the key to sustainable development (Morecroft, 2007; Warren, 2008).

The emerging models all focus on the building up and decline of core assets, including workers, equipment, population, workload, perceived service quality and financial resources. Each of the strategic resources can be controlled, to some extent, in isolation of the others; however, where there is not balanced growth or coherence in the assets, then organisations will likely be unable to grow to achieve their own potential, or might grow in a non-sustainable way. The two common features in strategic resource management, as shown in Figure 2, are the requirement for consistency between strategic assets and the need to actively manage each strategic asset to maintain balance.

A synthesis of both the complementary approaches is portrayed in Figure 3.

This paper will predominantly use a dynamic PM approach, since its primary focus is on empowering small and micro-business entrepreneurs with lean modelling tools through which they may frame the structure and behaviour of their company’s key-performance indicators.
3. Contexts and lean dynamic PM applications

As introduced in Sections 1 and 2, in this paper, we consider the role of dynamic PM in developing small business owner/managers’ managerial skills and increasing the likelihood of successful strategic management through its application in a number of case studies. For this analysis, we have identified four different situations or contexts in which small and micro-firms face special challenges in trying to move their businesses forward:

- **Contexts**, which define four typical contextual settings that differentiate small and micro-businesses according to a number of relevant characteristics, such as market orientation (e.g. niche, non-niche), market scope (e.g. local, worldwide), development stage (e.g. start-up, established company), product-making process (e.g. artisanal, technology-based). Namely, these small and micro firm contexts are: the artisan, the new company start-up; the established firm and the “micro-giant”.

- **Needs**, which identify – for each context – those requirements that small and micro-firms should satisfy to pursue business survival and development.

- **Obstacles**, which point out the specific barriers/threats related to the achievement of small and micro-firms’ success within the different contexts.

- **Solutions through dynamic PM**, which support the long-term success of the venture.

Before examining the specifics of dynamic PM in such issues, we will consider the above dimensions for each of the small and micro-firm contexts. To these dimensions, into sharper focus, we include brief vignettes of the case studies that we have investigated.

**Context 1 – the artisan**

This context reflects the situation of a firm, as an entrepreneurial entity that does not yet exist. A business is in place but all the work is carried out by a single person who is able to master technical work, perhaps supported by an assistant, maybe a young family member. The artisan is considering developing and maybe expanding the business, his/her technical and entrepreneurial skills may not be enough to start a company.

In this situation, the artisan has at least two major needs to accomplish a successful transition into an entrepreneurial business:

1. converting a good product into a sustainable business; and
2. getting entrepreneurial skills from either outside sources or from inside (personal development).

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**Figure 3.**
A synthesis of dynamic RBV and dynamic PM as complementary approaches to managing organisational growth in a sustainable development perspective.
It is not argued that this is a complete list. We just argue that these needs are likely to be central to all "artisan vs. entrepreneur" transitions.

There are likely to be many obstacles to making such a fundamental change (again this is not an exhaustive list.) First, the artisan must be able to understand and estimate the time and scope of new skills needed to make a major change from an artisanal to an entrepreneurial skill base. The artisan will then need to identify the possible sources of those entrepreneurial skills. A key barrier in many transitions is counteracting the artisan’s reluctance to relinquish control to outsiders: this might include any specialist managers brought in, contracted accountants or book-keepers, outside stakeholders like suppliers of funds and supply chain partners.

The role of dynamic PM is to support the development of solutions that address the needs of the artisan and overcome barriers. This is an issue of measuring key-performance variables to prioritise action and to assist in describing and monitoring implementation. Specifically, in this case, this means the measuring of non-financial variables and, namely, those related to time and skills of the artisan. This may imply a focus on personalised insight modelling – simple processes that involve diagrams, scenarios and possibly very small and simple simulation models that focus on key decision variables and can assist in the surfacing and communication of knowledge between stakeholders.

“Cremolose” is a family business that produces and sells handcrafted ice-creams, sorbets, slushes, pastries and cakes. It was started in 2000 by Nino Matranga together with his brother, after a long experience as a bar assistant. The business (i.e. the main store) is located in the city centre of Palermo (Sicily/Italy) and has experienced a rapid growth in its start-up phase.

Such a growth has been based not only on sales turnover, but also on the opening of new stores in franchising in different parts the world.

The core competencies are related to the quality and uniqueness of its main product (called “cremolosa”) that has been invented and patented by the founder, who holds high handcraft and technical skills in this business sector. Particularly, the “cremolosa” is a slushed ice-cream produced in various fruit flavours, such as almond, mulberry, nuts, strawberry, pistachio nut.

However, in the past few years, the company’s performance started to decline due to a too rapid and unsustainable growth whose causes can be referred to the lack of a managerial approach in developing the business by the founder. Actually, Mr Matranga – encouraged by the success of his firm – tried to enter in new businesses (i.e. launching other food businesses, fitness centres, etc.) by investing the earnings gained through the “cremolosa”. But, the lack of managerial competencies and the shortage of time dedicated to developing the core business (especially in terms of technicalities and strategies to develop new products/markets) have led to relevant losses. Namely, the lack of managerial skills and PM tools has resulted in a wrong definition of the product price (too low, if compared to the costs related to the business expansion), and a misperception of the weak signals emerging from the market sector (e.g. cost containment and low price strategy).

Context 2 – the new company start-up
This context reflects the very different situation of a new company being launched, based on a business idea which is conceptualised and developed from scratch. This differs fundamentally from the circumstances of a new business being created from an existing base-level artisan
activity, where the core products or services remain the same, but an established business would offer longer-term security with growth and job-creation potential.

The basic need in this context is to identify and develop the most appropriate business model for the new venture encompassing the processes of creating the product/service to be offered, the financing options, distribution channels and the engagement of internal knowledge resources and external partners of various types. Any or all of these might involve quite new and novel processes.

The key barriers to success in this context are:

- The tendency for inexperienced business model and process designers to adopt static and non-systemic perspectives in sketching business plans.
- The difficulties in devising and carrying through a proper evaluation of the emerging business model and identified alternative ones. This may be because of a lack of well-developed skills in business modelling or simply the inherent difficulties in doing this for highly innovative and novel structures.

Design and evaluation processes for developing the most appropriate business model have to permit and support the creation of dynamic business plans (Bianchi, 2002); this implies a focus on either generic or “tailored” corporate models. Further, in the longer timeframe, there may be a need for adapting and updating dynamic business plans during implementation, i.e. the business plans serve as, mainly, a management, rather than a forecasting, tool. Given that the circumstances might involve fast-moving and emerging new industries, there will be a continuing role for comparing and re-evaluating alternative futures/business models (Cosenz, 2017).

Mosaicoon is a small-sized company established in 2008 in Palermo (Italy). Its core business focuses on the development of innovative marketing tools. The success of this business is based on the introduction of innovative advertising models that combines the components of traditional advertising campaigns with those of interactive videos. Such a combination has determined the invention of the so-called “viral advertising”.

Particularly, viral advertising has been defined as “a marketing technique that uses pre-existing social networks and other technologies to produce an increase in brand awareness or to achieve other marketing objectives through self-replicating viral processes analogous to spread of computer viruses” (Source: Wikipedia). Therefore, Mosaicoon develops advertising videos for its customers – usually large-sized or multi-national companies – to be uploaded in strategic positions of the web, i.e. in those online platforms that allow videos to be viewed and posted in other web pages (e.g. social networks). Based on both the quality and the attractiveness of its contents, as well as on the commercial contacts, the advertising video receives a number of feedbacks from the internet users that broadcast these interactive products on the web, like a virus. The more views a video obtains, the more revenues the company achieves (Bianchi et al., 2015).

Mosaicoon’s product portfolio includes design, execution and tracking of advertising campaigns.

So far, Mosaicoon staff counts 35 people and, according to current managerial forecasts, the workforce will grow up to 50 employees in the next few years. All employees are less than 35 years old. The company’s organisational structure is divided into four main strategic business areas: commercial, creative, seeding and financial.
The increasing development of the company – particularly in terms of sales, commercial staff and new orders – is being supported by fundraising institutions that noticed its business potential during start-up competitions.

Mosaicoon’s competitive strategy has been designed to position the company in a high-end market segment. This has been made by fixing a high price of interactive products that, otherwise, might dangerously allow potential competitors to easily access the market and undermine the competitive advantages so far achieved by the firm (Cosenz, 2012).

The external limits to growth are mainly related to the characteristics of the market where Mosaicoon competes. Indeed, viral marketing offers weak barriers to the entrance of new competitors that can be located all over the world. Therefore, such a sector – also characterised by a rapid obsolescence of its technological equipment, as well as products/services – can be easily entered by those small or large-sized firms with high innovative assets. To remain competitive, Mosaicoon is called to continuously invest in those strategic resources linked to the specific critical success factors of the market (e.g. commercial contacts, R&D).

Context 3 – the established company

This scenario involves small and micro-firms which have operated over an extended period of time according to consolidated and quite successful business models. These will usually have been developed on a local basis. While the circumstances of the business – both internal and external – remain stable, then the established business model will continue to be valid and operational. However, over time, there are likely to be changes and drifts. These might be internal – for example, in family firms more family members might be drawn in each wishing to share in profits and influence decisions, or new managers might be recruited in – or external, like changes in legal requirements or the entry of a major new competitor. While mostly these will not require any significant changes to the business model in use, there will be a need to monitor business performance and, if necessary, develop or evolve a new business model (Cosenz and Noto, 2017). In particular, there is a clear need for the co-existence of a shared (team) leadership and individual leadership.

There are two major barriers to the successful evolution of such established firms in any change situation. First, a failure to detect weak signs of important change, this means the firm could be overtaken by circumstances – the so-called “boiled frog” scenario (Senge, 1990). Along with this is the failure to recognise the need to change the existing business model.

Solutions to these problems involve:

- Making tacit knowledge explicit so that it can be shared within the organisation (e.g. training new managers/entrepreneurs).

- Balancing family and/or manager involvement with business growth. Possible relevant performance measures might include, for example, “Ratio of family managers’ salaries/Company revenues”. There must be a focus on dynamic patterns of such indicators and improvement through reporting the ability of company decision makers to understand the systemic relationships behind their dynamic behaviours over time.
Mazzara is a pastry shop and cafeteria located in the city business centre of Palermo, Italy. It was founded in 1909 and has always maintained a deep-rooted tradition of Sicilian pastry and ice-cream making.

The success of this small firm has been based on a consolidated business model exclusively developed on a local basis. Particularly, the location – sited in the heart of the historical neighbourhood of Palermo – the elegance of the furniture and the artisanal quality of the products have represented its main sources of competitive advantage. Such factors have strongly influenced the firm’s image that also contributed in designating the shop as a “cultural lounge” of the city. Actually, in the post-Second World War, many international actors, intellectuals and writers (such as Giuseppe Lanza Tomasi di Lampedusa) were regular clients of Mazzara.

The main products made and sold by the firm were traditional Sicilian cakes (e.g. cassata, cannoli, other ricotta-cheese pastries), almond biscuits, ice-creams, fruit-chocolate-cream pastries, freeze melon cakes.

In the last two decades, the firm has enlarged the shop in terms of seats and tables, and has also hired new personnel to improve the service. In 2013, there were 32 employees working as waiters, confectioners, chefs and assistants. Besides this, Mazzara maintained its traditional furniture and location.

However, such a business model – that has allowed the firm to achieve its success during the last century – has gradually been perceived by the clients as too old-fashioned. At the same time, a number of new pastry shops and cafeterias have opened in the same neighbourhood adopting a modern style of furniture and services. The lack of managerial competencies and PM tools has prevented the firm to perceive the weak signals related to both a change in customer behaviours and an increasing competition emerging in the external environment.

Also, in the last decade, the financial crisis has significantly reduced the potential market for the firm. In fact, the business centre of Palermo has been dramatically affected by bankruptcies and downsizing policies which have decreased the number of employees in the bar area, who were used to spend their free time, having a break during the working days.

The described phenomena led to a reduction in the customer base; consequently, a financial crisis has been publicly declared in 2014. Nowadays, Mazzara has closed the shop in the city centre and is currently searching for opportunities to save its traditional pastry-making expertise.

**Context 4 – the “micro-giant” company**

This context involves small firms that have developed surviving and possibly thriving businesses on a local basis, despite the fact that the nature of their businesses and products mean they have to compete against one or more a “giant” companies – large, strong, maybe multi-national businesses. While such a micro-giant might have successfully entered this
hostile environment, or survived when a “giant” entered and threatened its marketplace, for continued success, it needs a sustainable model for competing against “giants” (Bianchi et al., 2014). This will involve developing the abilities to resist competitor initiatives, efficient use of limited resources to develop new products, and so on.

The major barriers to success are likely to involve an inability to change from a siege mentality – a “David fighting Goliath” – to a stable competitive company, albeit a micro-giant (Bianchi et al., 2014). In particular, this is likely to depend critically on being able to learn how to be nimble/flexible and to react quickly to competitors’ moves.

One critical determinant of success in such firms is the retention of customers/clients, and so PM is likely to involve the dynamic exploration and measurement of the drivers of trust and loyalty by the local community and customers. Another key factor will be the discovery and delivery of new products/services (e.g. product extension, innovation), and critical to this will be the micro-giant’s ability to measure and manage the efficiency of its R&D function (Bianchi et al., 2014).

Sellerio is a publishing house that was founded in 1963 by the Sellerio family, which viewed the then-cultural scene as offering business opportunities. In particular, well-known Sicilian writers like Leonardo Sciascia and Antonino Buttitta supported the spirit of such enterprise. Initially, Sellerio decided to position itself in a “peripheral” market niche, since the core of its editions was represented by light but stylish materials, enhanced by graphical elegance and engravings and illustrations by important illustrators. The main authors published by Sellerio came from the Sicilian literature tradition and other European quality niches. The direct managerial responsibility of the owner-family, the small number of employees and the peripheral position of the firm all define it as a small-sized enterprise. On the other hand, its successful sales performance and long presence in the market confirm Sellerio’s ability to compete on a day-to-day basis with “giant” enterprises.

The importance of intellectual capital for the success of enterprises in creative industries has been remarked by several authors. In this respect, Sellerio has demonstrated a strong inclination to discover and nurture the hidden potential of unknown young writers. Further, their successful writers have relied on the publisher to promote and position their work, contributing further to improving the firm’s competitiveness. The quality of product and graphics are considered significant drivers in creating a distinctive format for collections and books (Barnard, 2005). This factor and the firm’s high reputation encourage customers to select their titles just by looking at the covers, even when customers are not actually familiar with the authors or content. The final Sellerio strength has been its ability to mount promotional campaigns – its tight control of production costs enables it to compete by lowering books prices and promoting discount campaigns.

For each of the contexts identified, a brief case vignette has been offered based on one of the case studies the authors have undertaken in developing the context-based analysis of the potential role for dynamic PM in supporting the management of smaller firms as they evolve. Each of the vignettes briefly encapsulates a period during the case company’s lifetime. They have been selected to provide an insight into each of the context categories, and picks up some of the broad detail of the firm’s evolution during the period. The stories also reflect the general pathway of “Context→Needs→Obstacles→Solutions” along which the companies passed. However, this pathway is a summary, and common, construct
developed by the authors through retrospection with the cases, and was not a conscious process reportedly undertaken by the companies and their managers at the time. Two of the four companies appear to be moving forward, though not always perfectly smooth, while the other two have encountered severe problems.

Table I resumes the specific needs, obstacles and critical issues for introducing dynamic PM in the small and micro-businesses above analysed.

The reader can speculate as to whether the apparent solutions chosen by the firms’ owner/entrepreneurs are likely to be successful (or, in one case, whether the firm’s demise was foreseeable). Of course, in each case the firm is at a different phase of evolution, facing quite different challenges, and is in a different industry, but there are a number of interesting similarities. The need for a dynamic view of the future is clear in each case—the companies are all going through transitions which will make their futures quite different to their pasts. All the companies were going through significant strategic changes, often initiated by external factors in their marketplaces, but frequently due to internal issues emerging, either spontaneously, as the company grew and changed, or because of attempts to adapt to the new external factors. An RBV of the firm and a focus on the dynamics of relevant performance measures are central to these processes.

<table>
<thead>
<tr>
<th>Context</th>
<th>Case study</th>
<th>Needs(s)</th>
<th>Obstacle(s)</th>
<th>Critical issues for dynamic performance management</th>
</tr>
</thead>
<tbody>
<tr>
<td>Artisan</td>
<td>Cremolose</td>
<td>1 Acquisition of entrepreneurial skills (ES)</td>
<td>Failure to identify need for ESs</td>
<td>Time and scope of new skills needed to make a major change from an artisanal to an entrepreneurial skill base</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Inability to assess ES development</td>
<td>Assessing artisan’s reluctance to relinquish control to outsiders</td>
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<td></td>
<td></td>
<td></td>
<td>Lack of tools to evaluate new businesses in portfolio</td>
<td>Costing and pricing</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>Identification of customers and competitors</td>
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<td></td>
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<td></td>
<td></td>
<td>Balance of demands on internal resources</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>Portfolio management metrics</td>
</tr>
<tr>
<td>New start-up</td>
<td>Mosaicoon</td>
<td>1 Ability to maximally exploit business models</td>
<td>Maintaining balanced growth</td>
<td>Identification of key success factors in the competitive system</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2 Harnessing of internal resources</td>
<td>Framing competitors and customers</td>
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<td></td>
<td></td>
<td></td>
<td>1 Detection of performance drift</td>
<td>Level of coherence of vision amongst stakeholders</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2 Evaluation of new business models</td>
<td>Measures of alternate growth potentials</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>Understanding of dynamics of growth</td>
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<td></td>
<td></td>
<td>Identification of causes and dynamics of performance drift</td>
</tr>
<tr>
<td>Established</td>
<td>Mazzara</td>
<td>1 Detection of performance drift</td>
<td>Inability to detect changes in customer preferences and behaviour</td>
<td>Revenues per unit resource by product sector</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2 Evaluation of new business models</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>“Micro-</td>
<td>Sellerio</td>
<td>1 Ability to react swiftly to competitor initiatives</td>
<td>Inability to articulate consequences of drift</td>
<td></td>
</tr>
<tr>
<td>Giant”</td>
<td></td>
<td></td>
<td>2 Harnessing of internal product development capability</td>
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Table I. A synthesis of the specific needs, obstacles and critical issues for introducing dynamic PM in the described small and micro-business case studies.
Specifically, an RBV is needed as it relates both to hard resources such as author inventory in Sellerio, retail space in Mazzara, or to soft resources like business development skills in Mazzara, and design and product development capabilities in Mosaicoon. A focus on the dynamics of performance measures is needed, since it will allow business decision makers both to understand which dimensions (beyond the financial one) should be gauged to pursue sustainable development, and to support them in identifying the relevant drivers of success; the improvement (or stability) of these over time is possible through the identification, building and deployment of strategic resources.

The second common feature is the importance of entrepreneurial competencies; this involves elements of envisioning the future (or alternative futures), the surfacing and sharing of the entrepreneur’s tacit knowledge, and general issues of communication of ideas and the building of alignment of perspective and thinking amongst the stakeholders. This fact also clearly points to why an explicit PM approach, particularly one that is itself dynamic, is essential. This perspective must focus on how performance has been evolving and how it can continue to improve throughout the changing circumstances. This will involve tracking small changes, or drift, in performance so that action can be planned and implemented in good time, and that dynamic factors both during and after any transitions are considered. It is also essential that such a lean dynamic PM approach works alongside and complements a dynamic RBV of the firm and supports/enhances the leadership of the firm.

4. Two examples of lean dynamic PM systems in small and micro-firms

In this section, we show and discuss two examples related to the application of a lean dynamic PM approach to real small business failure/success. Particularly, we will focus on both the artisan (Cremolose) and the new company start-up (Mosaicoon) contexts.

Regarding the first case, the development of a lean dynamic PM framework has allowed us to selectively identify a set of performance indicators that might have supported Mr Matranga in framing the Cremolose business system. In particular, the identification and measurement of performance drivers – as well as the understanding of the forces affecting them – might have supported Mr Matranga in assessing the long-term effects caused by the adoption of his emerging strategy.

The competitive development of the firm has been based on the quality and uniqueness of its products. This variable is here modelled as a ratio between the company product quality and competitors’ product quality. Such competitive advantage has been built based on the entrepreneur’s abilities (as an artisan) to develop innovative and good sorbets (very close to their natural flavours) in the core business. The change in product quality (end-result) is affected by a driver measured by the ratio between “time allocated to improve product quality” and the desired time to improve quality (i.e. a benchmark).

A higher product quality perceived by the market, in comparison to the firm’s competitors, can increase the sales orders rate (end-result), which affects sales revenues, income and cash flows (which are end-results also on a lower layer of inference). A higher level of liquidity (strategic resource) – due to positive cash flows – can be invested in purchasing high-quality raw materials to be used in producing slushed ice-creams, sorbets and other pastries. This policy can further increase the core product quality (reinforcing loop fostering business development).

The firm has experienced a number of limits to growth, which have generated a crisis. Such limits can be detected – likewise it was commented regarding the development forces – by a number of performance drivers.

First of all, it is possible to mention “Process efficiency” and “Costing reliability”. The first driver can be measured by the ratio between kgs of product and the quantity of consumed raw materials (raw materials yield). The second driver can be measured as the ratio between
estimated and actual production costs. Both drivers are affected by the entrepreneur’s skills: the more the company grows in its core business, the more the entrepreneur needs to develop new skills, beyond his fundamental technical skills in artisanal pastry making.

Concerning this, a lean dynamic PM system might have enabled the entrepreneur to identify the sources of possible limits to the company’s growth and the crisis risks related to the total available time of the entrepreneur and the available liquidity to reinvest to build new competencies (in minimising waste and improve costing). So, a trade-off between the need of increasing the total time to allocate to management activities (i.e. the need to hire a manager or finding a business partner) and the need of slowing down the sales turnover growth rate would have been promptly and selectively perceived by Mr Matranga. Here, the entrepreneur’s technical skills (which have been named in this way to differentiate them from his artisanal skills) have been modelled as stocks of strategic resources. Such stock can be increased by corresponding inflows, which depend on financial and time investments.

A declining or unsatisfactory performance in process efficiency and costing reliability reduces income and cash flows, in spite of an increasing product demand (balancing loop underlying a limit to the company’s growth). In fact, on the one hand, a lower costing reliability affects the profit and loss statement of the firm, since actual production costs are higher than the budgeted values. On the other hand, low process efficiency – at least in the long run – forces the firm to increase the product price even beyond market thresholds (related to competitor’s prices, demand elasticity associated to the product niche). A too high price may generate a strong reduction in market demand and in cash flows. Negative cash flows would generate a reduction of liquidity, which would further limit investment in the new entrepreneur’s technical skills or in the acquisition of high-quality raw materials (reinforcing loop underlying a financial and competitive crisis of the firm).

More performance drivers associated with the allocation of entrepreneur’s time to run the (core) business are linked to the trade-off between the time needed to feed the development of new businesses. Encouraged by the rapid success gained through the quality of products, the entrepreneur decided to enter new businesses – such as other food stores, fitness centres – that have diverted his attention from the development of the core business. The time dedicated to other businesses has led to an impoverishment of product quality and a consequent reduction in the sales orders rate. Furthermore, the rising financial needs related to the investments in different businesses have strongly decreased the liquidity gained through selling the Cremolose products. As a result, nowadays, the firm is marginalised at the borders of the city market.

Figure 4 provides a framework of a lean dynamic PM system based on the Cremolose business.

Concerning the new company start-up context, we also developed a lean dynamic PM framework based on the Mosaicoon business. As described in the previous section of this paper, the firm makes and broadcasts advertisement videos on the web. The increasing success that Mosaicoon is currently experiencing can be mainly related to the massive number of views (end-result) that its online videos are able to collect in a short time span. An increase in video views depends on video quality, which is measured as a ratio between Mosaicoon’s and its competitors’ video quality. The total number of videos that have been successfully put online affects such quality: the more experience has been developed, the higher (other things being equal) the quality of videos will be.

A strategic resource affecting the development of online videos and their quality is the customer base. The change in the customer base (end-result) is affected by the relative price of company services (“company price/competitor price” ratio) and by the relative business image (“video views/desired views” ratio). The first performance driver is affected by the strategic resource related to the average company price (perceived by the market). The second driver is affected by the stock of total views. The two drivers affect the end-result
named “change in customers”. In fact, while a high price (in respect to the competitors) may reduce the change in customers, a high relative business image may offset the effects on the change in the customer base generated by a premium price strategy. Concerning this, to maintain a small size of the firm, Mosaicoon’s competitive strategy has been designed to position the company in a high-end market segment. To this end, once the company has built a strong image into the market, such a goal has been pursued by fixing a higher price of interactive products in respect to the price of its competitors’ products. Though, a too strong price increase may dangerously undermine the competitive advantage so far achieved by the firm.

To increase the customer base, the company may also focus on the commercial efforts of those employees who regularly work in the commercial business unit. Namely, commercial efforts can be measured in terms of productivity, i.e. by assessing how many commercial contacts each employee is able to collect by promoting advertisement campaigns and other interactive marketing products. Beside this productivity driver, the firm also needs to measure how many commercial contacts will become regular customers. To this end, the indicator that evaluates the number of customers gained per commercial contact represents a useful parameter of its commercial effort effectiveness.

Such analysis has emphasised the main drivers, directly and indirectly, affecting the number of views. Views affect sales revenues, income, and cash flows (lower layer end-results). A growth in these competitive and financial end-results will generate a stronger endowment of strategic resources owned by the firm, which will generate the basis for further development (reinforcing loop). In fact, as shown, a larger customer base and number of views will foster a development of the experience in producing videos, which will increase their quality. A higher number of total views will increase the company reputation, which will allow the firm to apply a premium price with no loss of customers, but with a higher profitability of each transaction.
A higher stock of liquidity will foster the hiring of new salespeople. This will generate new contacts, new customers, more views, higher sales revenues, income and cash flows. Likewise, it was commented in the previous case, also in this example, there are possible limits to growth. Such limits can be referred to corresponding performance drivers. Ignoring a shrinking performance of such drivers may first slow down the business growth process, then may even determine negative commercial and financial end-results.

For example, ignoring the “law of diminishing returns” related to a too aggressive commercial strategy, based on a too intensive salespeople hire rate, may generate too high “salespeople salaries/Indicated salespeople salaries”. The denominator of this ratio refers to the sustainable salespeople costs that the current sales revenues on which the firm may rely would allow. A ratio higher than one is not a negative factor per se. In fact, if the increase of contacts, customers, video views and revenues that an aggressive salespeople hiring strategy may determine more than offsets the increase of salary costs, than the previously commented growth-oriented reinforcing loop can be fostered. However, a too high salesforce increase would result in a reduction of income (since the increase in fixed commercial expenses would be higher than the increase in sales revenues). This would result in a drop of cash flows and liquidity. Such phenomenon would act as an internal limit to a further salesforce expansion.

Figure 5 portraits a lean dynamic PM framework based on the Mosaicoon business.

5. Conclusions
All small and micro-enterprises at some point in their evolution will undergo one, or indeed several, significant changes brought about by either external forces or internal developments. There are classical strategic management tools available to support the process of strategic repositioning, including the use of the RBV of the firm, but we have considered the potential
benefits of lean dynamic PM systems to enhance these approaches. In this research, the “lean” attribute is used to characterize a different approach in applying PM to small firms, compared with applications to larger organisations. We would expect that such systems will be able to make use of entrepreneurs’ tacit knowledge and enhance their managerial competencies by incorporating positive individual attributes into organisational routines.

Our direct experiences and case-study analyses, some of which have been presented in detail here, have indicated that sudden crises, and, in some cases, a company’s eventual demise, are often a product of gradual changes in circumstances that entrepreneurs have not been able to detect and isolate promptly and/or not counteract. We have considered how classical information and decision-support tools, formal, financial-oriented and structured accounting systems are typically employed. However, their value is limited in terms of supporting decision makers in figuring out important patterns of behaviour over time, and in framing and examining the causal structure affecting them. These are essential if the entrepreneurs have to make effective decisions which will ensure a longer-term sustainable future for their firms. By placing the situation of companies facing structural change into the framework of:

"Context → Needs → Obstacles → Solutions".

We have looked at the process of moving to new structures and activities, including placing this into the circumstances of four cases, presented briefly as vignettes. The cases recount the evolution of the companies supported by analysis using then current approaches. We have therefore presented a more detailed examination of two of the cases which presents a lean dynamic PM systems approach. This defines a PM system that is appropriate for the resources and capabilities of the smaller firm, but which can still take on board the dynamic nature of the firms and their environments.

We argue here that using such a lean dynamic PM system can help entrepreneurs and their direct collaborators in the process of the company-specific and continuous scanning of crisis symptoms, and the detection of opportunities for developing their business. This conceptual framework reveals a quite original empirical basis to outline a lean dynamic PM system that might provide decision makers with a set of key-performance drivers that helps them to prioritise action. We would further claim that our analysis here demonstrates how a focus on “dynamic” performance could support the managerial competencies of creative entrepreneurs in communicating the core and purpose of their business idea, both inside and outside the firm. It should also help entrepreneurs to restrain their emotional spirit, and to isolate and understand better the pertinent system and its delays, beyond the peripheral issues that can tend to over-tax their mental and physical resources.

References


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