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Conference Declaration

Theme:

'Creating futures: Sustainable economies?'

Purpose:

To share continuous and collaborative research outputs that review existing strategies and to propose mechanisms for the likely achievement of a sustainable economy that is unique but inclusive to different entities in the world.

Target audience:

This year's 7th International Conference on Business and Finance (ICBF) continues its tradition of being the premier forum for presentation of research results and experience reports on contemporary issues of finance, accounting, entrepreneurship, business innovation, big data, e-Government, public management, development economics and information systems, including models, systems, applications, and theory.

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All papers were refereed by a double blind reviewing process in line with the Department of Higher Education Training (DHET) refereeing standards. Papers were reviewed according to the following criteria: relevance to conference themes, relevance to audience, contribution to scholarship, standard of writing, originality and critical analysis

Prof Mzikayise Shakespeare Binza
Dean of Faculty: Business and Management Sciences
Cape Peninsula University of Technology,
South Africa

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Actions and conditions supporting strategic integration of BPM

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Business process management (BPM) is a holistic strategic management approach and a top-down methodology that aims at maintaining operational efficiency. Despite its importance to organisations, there is a lack of a practical understanding of how to successfully adopt BPM. To address the gap in the literature, an exploratory case study was performed in a South African company that adopted BPM in 2009. The two-part study specifically aimed to investigate which actions and conditions encourage successful adoption of BPM by targeting the integration between the strategic (top) and task (ground) levels within a BPM environment. The qualitative analysis results show that organisations can have a fair degree of control over the outcome of their BPM implementation. The first part of the interpretive study that focuses on strategy, culture and governance is presented in the article. Actions and conditions that facilitate strategic and task-level integration are described. The study reports conduct within three important themes in the literature. Careful planning around the themes 'strategic and task-level integration', 'BPM enablers' and 'business and/or information technology (IT) alignment' will support the practice regarding BPM implementations because the literature deems the BPM and information systems symbiosis as important. The findings corroborate the literature.

Introduction

Business process management (BPM) is seen as a key concept and strategy to achieve a more effective organisation, optimise business conduct and gain a competitive advantage (Antonucci & Goeke 2011; Armistead, Pritchard & Machin 1999; Thompson, Seymour & O'Donovan 2009). BPM is a young but growing research area with many researchers calling for a better understanding of the concept and/or strategy for various reasons. Firstly, the factors that contribute to BPM success have not been extensively researched and understood (Thompson *et al.* 2009). Secondly, even though BPM has been ranked as a key priority by the Gartner Group for a number of years, the current status of BPM research is not aligned with practical implementation and field reports of the methodology (Bandara, Harmon & Rosemann 2011). Thirdly, organisations do not have a sound understanding of what BPM has become. This is reflected by the low levels of maturity in the implementation of the practice and the selection of basic tools where more advanced and appropriate tools are available (Johnston, Munge & Mwalemba 2012). Part of the reason for the low uptake of BPM is that it presents organisations with challenges that arise at its inception, which are primarily caused by its ambiguity in language and semantics (Armistead *et al.* 1999). These challenges are exacerbated by the different meanings of the term 'process' across the various academic domains.

Therefore, the main purpose of the research is to better understand the practicality regarding actions and conditions that encourage the linkage and effective integration of strategy and task levels in a BPM environment within the theoretical context stated above. The research builds on the model developed by Thompson *et al.* (2009), which expanded the theoretical BPM success model of Rosemann, De Bruin & Power (2005) by defining what entails success in a BPM environment and the factors that enable the success. The model identifies six enabler categories: strategy, culture, people and/or resources, governance, information technology (IT) and methods. The data are analysed thematically to derive a list of actions and conditions within the six enabler categories. The article (the first of a two-part study) presents the findings relative to the strategy, culture and governance categories of the expanded BPM success model. The article's contribution is unique because of the practical report of a 5-year BPM implementation journey. The article is organised as follows: a review of relevant literature is followed by the research strategy and techniques. It concludes by presenting inferences from the collected data in the form of a list of actions and conditions per enabler category, which is illustrated and discussed in the context of a theoretical model.

Literature review

For the purpose of brevity, most of the literature will be included in the *Discussion* section. Figure 1 illustrates a combination of the concepts in the literature that motivated and supported the study.

Integrate: The strategy and task levels are linked as the integration between these two is crucial for BPM implementation (Armistead *et al.* 1999). Consequently, effective integration facilitates the application of strategic intent at an operational level. The outcomes of the study will address the integration by presenting actions that encourage integration.

Enable: The Thompson *et al.* (2009) BPM success model contains six categories of enablers for BPM. The categories, namely strategy, culture, people and/or resources, governance, IT and methods, are illustrated in the context of an organisational pyramid shown in Figure 1. Factors within these enabler categories aid in the implementation of BPM.

Align: BPM implementation depends on the clarity of the strategic intent as well as the alignment (Rosemann & De Bruin 2005; Thompson *et al.* 2009). Likewise, BPM implementation depends on business and IT alignment (BITA).

Research method

Ethical clearance

The main research question of the study is as follows: what can organisations do, from a strategic perspective, to encourage the integration between strategy and task levels in a BPM environment? BPM has not been well researched; therefore,

a predominantly inductive approach was chosen for the study. However, an a priori theoretical concept was applied. Three of the six enabler categories in the Thompson *et al.* (2009) study expanded BPM success model combined with a combination of concepts from the literature and guided the research by providing underlying theoretical concepts from which research objectives were derived. BPM had been implemented over a period of five years in the organisation, where the case study was conducted. Seven respondents who had played a key role during the implementation of BPM in the organisation were identified. These respondents' profiles are presented in Table 1. The respondents expressed their experiences during the implementation journey. Therefore, an interpretive philosophy was deemed suitable because it extracted the different perspectives of the key role players. Because of the nature of this approach, conclusions could be drawn from the single organisation's case (Flyvbjerg 2006). The exact position of their roles was not apparent in all cases as certain respondents could not be isolated to a specific level, whereas other roles clearly fitted into a certain organisational level, conducive to the research context provided by Figure 1. For example, two of the respondents acted as interfaces between the divisions and had a strategic focus as well as process and operational exposure. Respondent six was a business support manager (BSM) who had to make strategic decisions based on the requirements and implement process changes. The role also involved testing the IS underpinning BPM as well as implementing the system and concepts at the business operations level. In short, two of the respondents were positioned within the strategic level. Three of the respondents were positioned within the process level, and two were positioned at the task level.

A short questionnaire was used to profile the respondents and their exposure to BPM. Semi-structured interviews

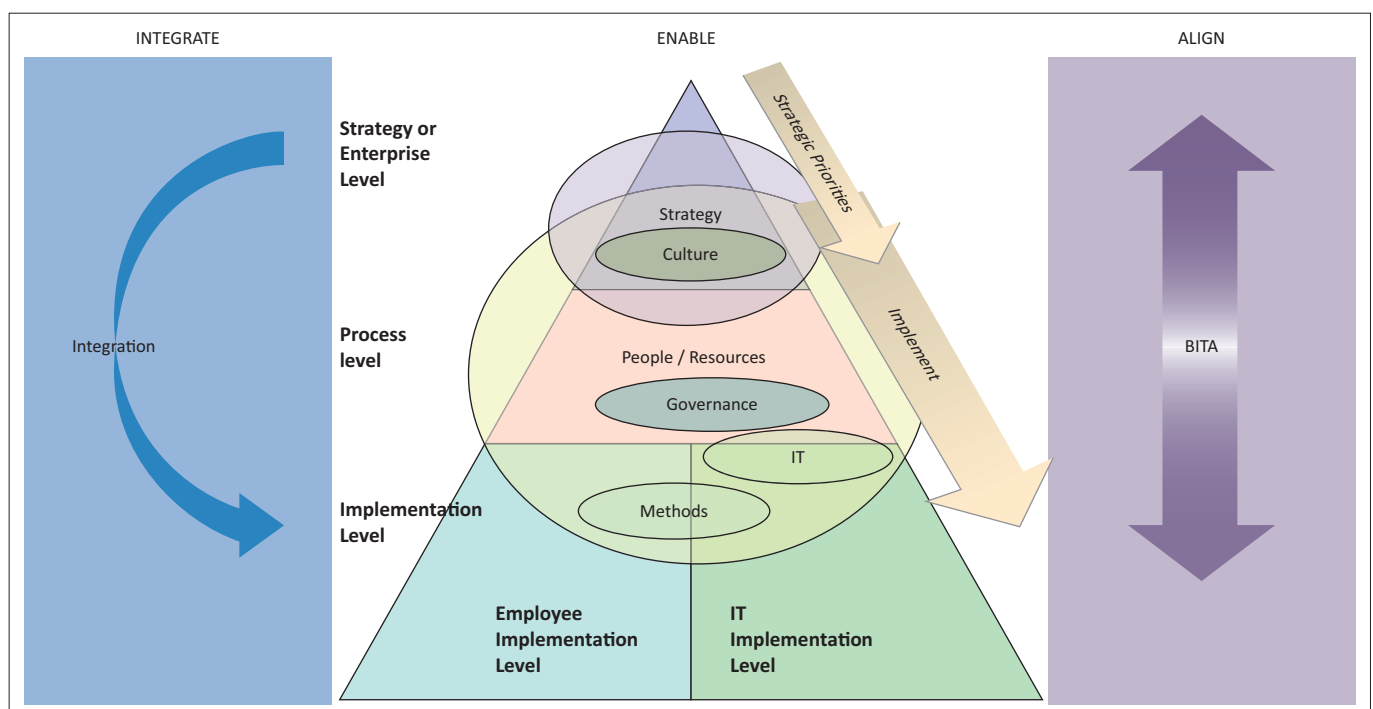


FIGURE 1: Construct of a combination of concepts from the literature that support the research.

TABLE 1: Summary of respondent profiles.

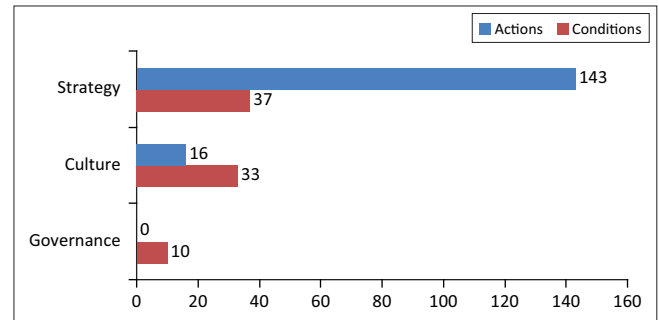
Respondent	Title	Primary BPM background	Years at company	Years of BPM experience	Level of role
Interview 1	Technical team lead (IT)	Technical	3	3	Task
Interview 2	Solution designer and/or business liaison	Technical and business	15	4.5	Process
Interview 3	CIO	Business	15	10	Strategic
Interview 4	Technology specialist (IT)	Technical	18	5	Task
Interview 5	Senior systems analyst	Technical and business	13	6	Process
Interview 6	Business support manager	Business	23	4	Process
Interview 7	Senior manager (business)	Business	5	10	Strategic

followed, which documented their experience during the implementation of BPM. Interview questions were constructed in the context of and tailored to each of the six enabler categories shown in Figure 1. The targeted interview duration was 30 minutes, and it was digitally recorded and subsequently transcribed. The researcher requested consent to record interviews from all participants. Ethical clearance was obtained from the researcher's university. The data were then collected and coded by means of thematic analysis to recognise patterns across different data sets (Fereday & Muir-Cochrane 2006). Text extracts were taken from the transcribed interviews and then related to the three enabler categories. The first iteration of this process resulted in 354 text extracts from the seven transcribed interviews. The text extracts were iteratively coded into sub-themes. The sub-themes were subsequently allocated to the six enabler categories. This process yielded 223 induced sub-themes spread across the six enabler categories. The result was 24 actions and 16 conditions, which were substantiated by text extracts. The 24 actions and 16 conditions were summarised and coded into a final 6 actions and 5 conditions, which formed the overall result of the second part of the research.

The case study was conducted at a financial institution that is a market leader in its competitive segment (hereon 'FIN'). The study focused on projecting the lessons learnt from this company's BPM implementation rather than evaluating the state of the company's success with its BPM implementation. The company which was conscious of the implementation journey had continuously sought to improve its processes. Within South Africa, FIN was a pioneer in the implemented architecture of the business process management system (BPMS), which consisted of a combination of the different layers of technology enabling BPM. The BPMS has delivered business benefits to FIN, such as optimised business operations and smoother functioning business processes which lead to cost reductions and increased client satisfaction. For this reason, its BPM programme continues.

Findings

The overall distribution of text extracts across the six main themes is shown in Figure 2. The proportion of text extract and the distribution was maintained throughout subsequent thematic analysis iterations. Most of the text extracts emerged as actions and conditions within the 'strategy' theme. This is in agreement with the literature which, amongst many

**FIGURE 2:** Distribution of text extracts across enabler categories.

definitions, states that BPM is a strategic approach of managing an organisation (Armistead *et al.* 1999; Johnston *et al.* 2012).

The preliminary findings were 10 actions and 9 conditions as listed in Table 2. These were further coded and reduced to four dominant actions and three dominant conditions, represented in bold font in Table 2. These are now discussed.

Culture is seen as a main driver for BPM, and it can cause BPM initiatives to succeed or fail (vom Brocke & Sinnl 2011). Proper governance depends on assigned process owners (Thompson *et al.* 2009). The study explored the staff experience of BPM from a 'lessons learned' and implementation perspective, and the governance aspects seemed least prominent. This could be because of several organisational restructurings resulting from executive management resignations, which was mentioned by one of the respondents. One such restructure was the appointment of a new chief information officer just before the research was conducted; therefore, some of the governance aspects might have been concealed during the research period. In addition, the head of BPM and staff reporting to him were not available for interviews during this period. The respondents who were interviewed were mainly exposed to BPM implementations and the resulting outputs. The researcher could not interview respondents who were more active in the improvement methodology area. Therefore, the 'governance' theme is represented by 2% of the conditions and actions.

Strategy

To obtain good results, an organisation should be aligned with its strategy. There are many areas that may require

TABLE 2: List of conditions and actions per enabler category.

List of actions and conditions		Text extract count	Relevant main theme
A1	Provide implementation support	41	Strategy
A2	Assign a liaison between business and IT from the start	27	Strategy
A3	Develop a feasible implementation process	30	Strategy
A4	Manage awareness and understanding of BPM from the start	21	Culture
A5	Plan well around IT capacity	10	Culture
A6	Define upfront the benefits that the BPM implementation will realise	23	Strategy
A7	Define roles and responsibilities to facilitate effective implementation	14	Strategy
A8	Clarify and document upfront the driving factors for BPM initiatives	33	Strategy
A9	Proactively manage the impact that strategic BPM has on the organisational culture	8	Culture
A10	Structure effective communication channels between strategy and task levels	4	Strategy
C1	A collaborative environment exists between business and IT	24	Strategy
C2	Optimised interaction between business and IT is supported by the tools available	23	Strategy
C3	Conditions should favour the development of process understanding	15	Culture
C4	Culture is supportive of cross-functional teamwork	19	Strategy
C5	A culture that supports continuous improvement to emerge	8	Strategy
C6	Solution design practices exist that favour reuse	11	Strategy
C7	Process and domain ownership is required	10	Governance
C8	An environment that supports and prepares the organisation for BPM ahead of implementation	8	Strategy
C9	There is sufficient ongoing funding for BPM initiatives	7	Strategy

alignment and others that should be kept in alignment in order to achieve the defined goals (Jeston & Nelis 2006:71). According to Rosemann and De Bruin (2005) and Thompson *et al.* (2009), linkage of BPM projects with organisational strategy enables BPM practice. In addition, such projects should add value to the chosen strategy (Jeston & Nelis 2006:71). Therefore, the organisation's strategy and architecture should support the implementation of BPM-associated technologies as well as principles; however, sufficient and ongoing funding is required to do so (Thompson *et al.* 2009).

The largest portion (40%) of the text extracts emerged from the 'strategy' theme. The perception of the driving factors behind and benefits realised with the BPM implementation at FIN varied widely, which indicates that the strategic intent behind its BPM had not cascaded throughout the organisational hierarchy. What was clearly presented by the data is that BPM had delivered different benefits to different audiences across the organisational hierarchy. Benefits include the following: better system integration which reduced business process cycles and interaction between divisions and companies, more information to measure business performance by means of process performance and measures, more information to better manage staff and workload, business cost reductions, optimised use of staff, earlier fraud detection which lead to cost savings, reduced and market-leading unit costs and standardised business operations in certain areas. The technology had been implemented under the BPM banner and views on why the organisation had adopted BPM varied, as indicated by the different views stated above. A common theme found amongst respondents was improved client experience and cost savings.

There were varying views on the banner under which BPM was implemented at FIN. Int7 expressed a perception that BPM was adopted to enable FIN to closely monitor and

discipline staff involved in routine BPM and workflow tasks. Metrics exposed by the BPMS, such as work queues, offer more information regarding time spent on work items and workload; therefore, the perception is that it would be used by FIN to have more work carried out by certain staff. Int7 is positioned in the IT division, and this perception was corroborated by Int4, from the business side by stating that the aim was to obtain more results out of the resources. Consequently, it is important to define and clearly convey the driving factors for BPM as a basis for benefits realisation. This will allow visibility on how BPM projects have directly contributed to the strategy. Moreover, there may be a possibility to reach consensus regarding the benefits achieved. This approach within the 'strategy' theme specifically supports strategic alignment.

IT and business alignment were cited as major issues by most of the respondents. The business did not feel as if their requirements were properly understood. Moreover, the business felt that the solution they were provided was far from their understanding of the specifications agreed upon (Int7). From an IT side, the misalignment between business and IT was acknowledged. Business did not feel their requirements were understood and completely translated to a technical solution they expected, and IT's view was that business did not understand the application that was created for them (Int3). Therefore, the misalignment was confirmed by both the sides, business and IT (Int2).

FIN reacted to this in certain instances, whilst in other instances, such circumstances were managed ultimately resulting in increased emphasis being placed on aligning IT with business. The actions specified in this subsection fall under the 'strategy' theme and support BITA. Custodians in this area of alignment were the solution designer (Int2) and the BSM (Int6). The following condition addresses these findings:

C1: A collaborative environment between business and IT exists

The solution designer became a business liaison. Regular meetings were held with business at various geographical locations, and the relationships were proactively managed. This role familiarised itself with system issues on the business side and did analysis to identify what impacted the business and caused the confidence in the BPMS to deteriorate. It was found that the small adjustments the BPMS and user interface had made a big business impact, resulting in greater satisfaction levels amongst business users. Furthermore, a stabilisation and optimisation drive began, as there were many system outages initially due the complex, layered architecture of the BPMS. These efforts from IT resulted in a more satisfied business customer and a more stable BPMS (Int2). The BSM had a similar function, by bridging the gap between the business communities. System requirements originating from various business divisions, and following different procedures in order to be implemented, go to the same IT division. The various requests were channelled through the (BSM) (Int6). Furthermore, this role operated as the liaison to IT, focusing on aligning business with IT from the business side. In addition, the misalignment between business and IT had impacted the quality of the solution that was delivered. The quality of the BPMS, which was delivered during the initial two phases, was not up to the desired standard (Int7). Consequently, the business deployed actual system users to aid testing and to confirm that the business requirements were being met. Therefore, the following action supports alignment practices:

A2: Assign a liaison between business and IT from the start

The outputs of these two roles resulted in implementation support for BPM in the form of a liaison on the IT as well as business side, subsequently a happier business customer and better, more managed working conditions that encouraged BPM. It furthermore benefited the organisation by cultivating a better working relationship between business and IT, effecting better operational results (Int4, Int3 and Int7). Business confidence greatly increased when they felt that IT understood their needs, and the effort to build and improve the working relationship was visible (Int7). As a result, the following action was derived.

A1: Provide implementation support

BPM in this case depended on the alignment between business and IT. Hence, the organisation responded by incorporating pro-alignment functionality into different roles. In addition, they shifted other resources around centralising the analysis competency to address a broader business scope (business change) so that the business requirements could be translated more effectively (Int5). As the BPM journey matured, there was a shift in awareness about how work was carried out. Project delivery received priority, and operational work, equally crucial to a healthy BPMS, received less attention (Int3). They realised that BPMS functionality depended on project work and that project work implementation processes between business divisions varied (Int6). In this instance, the

implementation was impacted because of the different nature of the business channels and the implementation had to be adjusted. Therefore, the following action was derived.

A3: Develop a feasible implementation process

Culture: The literature prescribes that organisations should create a working environment that favours cross-functional teamwork, where employees will continually seek to improve processes (Thompson *et al.* 2009). BPM is an enterprise-wide approach to horizontally manage an organisation and often organisations operate in silos, resulting in a failure to grasp a concept of end-to-end customer processes (Trkman 2010). A lack of common understanding of what BPM is can be attributed to the varying views of the methodology. The lack of consensus about the methodology, as well as a plethora of acronyms and misguided references associated with BPM, further creates confusion regarding the benefits, deliverables and expectations of BPM (Bandara *et al.* 2007).

Organisational culture can shape the way BPM works; conversely, BPM has an impact on organisational culture (Armistead *et al.* 1999). The impact that BPM has on the organisation should be managed; moreover, an awareness of the intentions behind methodology should be raised in alignment with the strategy. There was a perception that BPM was used to cut staff. Such a perception is detrimental to the perception of the methodology, and it might cause a counterproductive culture amongst employees. Therefore, the strategic intent behind BPM should be clear and conveyed to all those who are involved so that there is no confusion about the intention behind the methodology (Int4). In addition, there were complications because of a lack of process understanding when IT staff had to develop the system because BPM knowledge and concepts were generally lacking, which impacted BPM in the areas of system development and testing (Int4); therefore, the following condition applies.

C3: Conditions should favour the development of process understanding

There were various factors that impacted IT capacity. Business is critically dependent on the enabling technology, and BPMS outages had significant impacts. If outages occur, teams or divisions cannot work, depending on where outages happen in the system architecture (Int4). Subsequent to major project releases, multiple smaller enhancement projects followed, whilst large-scale project development continued, both making use of the same resources. After-hours work became a norm. Consequently, resourcing issues arose because after-hours work is intended for routine maintenance and operational tasks. This culminated the perception that BPM caused and requires overtime work (Int1). Therefore, the following action applies.

A5: Plan well around IT capacity

Action A5 impacted organisational culture at FIN. Various text extracts pertaining to it aligned with a culture that does not support BPM, and it may lead to further misconceptions about the methodology. Therefore, the suggestion is to

manage potential impacts to organisational culture. For example, the organisation was more proactive in the business space because change managers were appointed specifically to sensitise the business users who would use the new BPMS. The focus was to ease the users into the change that BPM brought as well as comfort the users in context of the negative propaganda associated with BPM such as retrenchments (Int4). Such an approach is more favourable to implementing BPM. Therefore, the following action applies.

A4: Manage awareness and understanding of BPM from the start

There was a perception that the organisational culture supports a main focus of delivering IT solutions to business, whilst continuous improvement of processes that effect the changes did not receive the attention it required (Int1). A view that the main goal is to deliver functionality does not favour BPM because all the resources and efforts are applied in the context of delivery and not improvement of processes. Issues that hinder operational process performance are raised in one cycle of delivery, and by the next, there is more caution surrounding previously experienced issues. However, the culture of delivery takes precedence and the deliverable receives priority focus (Int1). The BPM implementation journey at FIN equipped resources with invaluable experience during each implementing phase. Subsequently, they learned from their mistakes after each phased implementation and learned to use the tools and BPM concepts better (Int5). Therefore, the following condition was derived.

C5: A culture that supports continuous improvement to emerge

Governance: In a BPM environment, processes should have assigned owners with defined permission levels to change and alter the relevant process. Furthermore, process scope and integration touch points with other processes should be defined (Bandara *et al.* 2007). Ownership should be established and transparent; moreover, accountability should be well-defined. It becomes complicated when processes span the boundaries of business units; nevertheless, ownership should be enforced (Rosemann & De Bruin 2005). Decision making and reward processes should furthermore exist to encourage and guide employee efforts, and organisations should aim to remain as flexible as possible whilst at the same time keeping track of work (Bandara *et al.* 2007; Thompson *et al.* 2009).

Governance was impacted by the complexity of the technological implementation because the multilayered BPMS was deployed enterprise wide and it was not homogeneous. Therefore, one department could not be held accountable for one process in some cases because it spanned divisional boundaries and departments (Int2). Furthermore, because of the software architecture, it was difficult to hold a single party accountable for the portion of the application that falls within their domain. Consequently, a culture to protect personal interest arose because portions of the BPMS and process had no assigned owner, and if there was

a system incident at a particular point in the process and BPMS, accountability was shunned. Generally, ownership and risk taking regarding operational and system decisions were avoided, cultivating a culture that hindered process ownership (Int4). At the start of the BPM journey, BPM was very technocentric. Requirements and direction regarding changes were initially driven by IT; however, after the first year, control gradually shifted to the business. Direction regarding system requirements subsequently came from business. When IT drove requirements, the culture that underpinned BPM was technocentric, and when business started to drive requirements and system changes, the undertone became more strategic. Furthermore, business started to place more focus on ensuring that their requirements were met, because they were more assured of the strategic direction and no longer required IT to provide direction in the context of system changes, thereby supporting a more feasible business-driven BPM (Int7). Consequently, ownership should be assigned from the start so that the proper parties remain in control and steer process-related implementations. Ownership was unbalanced because in this case IT initially assumed ownership, as BPM was being implemented under a technological banner. If ownership assignment was a more managed discipline, then business might not have had to 'push back' a year after the BPM journey started in order to gain control of their processes. This relates to BITA, which has already been cited as a key matter. Because governance is a key issue at the strategic level, some of the actions in the 'strategy' main theme might address the 'governance' theme as well. However, because of coding, it migrated across to some of the other main themes. An example of an action in the 'strategy' theme which also supports governance is 'define roles and responsibilities to facilitate effective implementation'. This action supports ownership. Ownership has many dimensions and has vast impacts, and it remains critical in support of BPM. Subsequently, Action A1 caters for impacts to governance because process ownership will support the implementation of the methodology.

Figure 3 represents an envelope containing recommendations for BPM implementation. The recommendations are the actions and conditions discussed thus far. The envelope is the context in which the recommendations are presented. It is constructed by four main themes. Placed in the centre is the Harmon (2014) BP Trends pyramid, which represents the levels within an organisation: the strategic level is at the top, the process level in the middle and the implementation or task level at the bottom. The main themes found in the literature are represented as columns titled 'integrate', 'enable' and 'align'. The main themes, namely strategy, people and/or resources and culture, were applied during the data gathering and analysis of the research. Therefore, it supports the presentation context. The actions (A + n) and the conditions (C + n) are plotted relative to the combination of themes it applies to in Figure 3. The objectives of the article are addressed with actions A1, A2, A3, A4 and conditions C1, C3 and C5. Supporting arguments within the organisational context are found in the following sections.

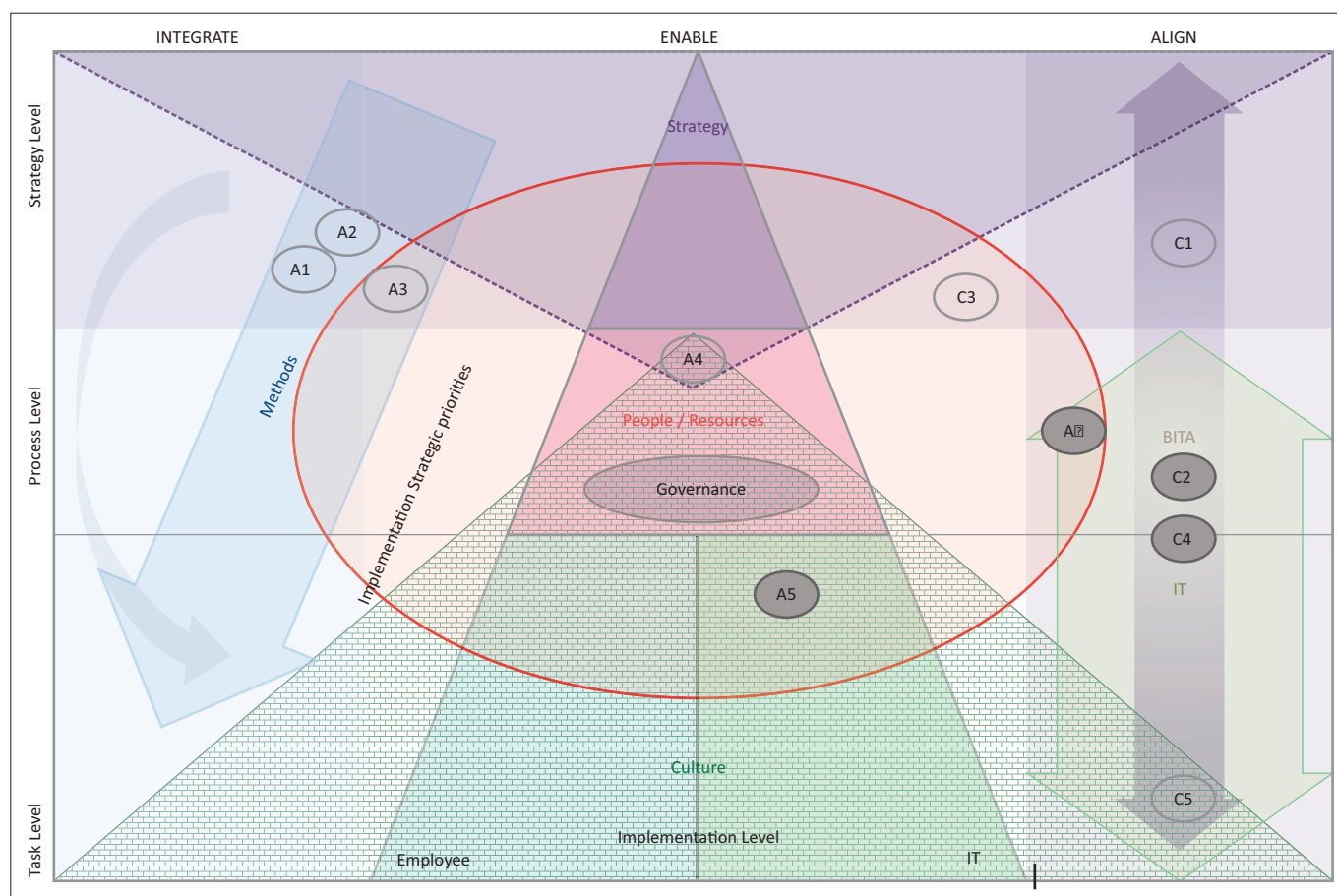


FIGURE 3: List of relevant conditions and actions per enabler category plotted against an organisational diagram.

Summary of the findings

Integrate: To the left of the envelope in Figure 3 is the 'integrate' theme, which addresses the integration between the strategic and task levels in a BPM environment. At the strategic level, the actions A1, A2 and A3 were found to be dominant. It can be viewed as BPM implementation methods that facilitate linkage between the strategic and task levels with the following output: an employee base that is more aware of BPM from the strategic through to the operational level. FIN provided implementation support during development phases. It was carried out to ensure that business requirements had been fully met by the functionality of the technical solutions. Business was not part of the development process in the first major technological release, and they experienced challenges with quality and functionality post-implementation. Business was involved in the systems development processes after the first phase, and the technological implementations were much smoother. Moreover, it was more stable after implementation. FIN deployed a post-implementation support team. This team supported business users and consumers of process changes for 4–6 weeks in each region after changes to the BPMS. This was carried out to reassure and educate the user base post-implementation and in support of BPM implementations. Therefore, condition C1 applies. Organisations can tailor implementation methods to suit specific needs and align with the strategic intent and furthermore recruit staff to support and favour its BPM intentions. Consequently, actions A1, A2 and A3 apply.

Enable: In the centre of the envelope is the 'enable' theme. The actions and conditions that are plotted here can be considered as the 'fertiliser' in a BPM environment. Should organisations wish to adopt BPM, these actions and conditions will allow it to flourish. In conjunction with the implementation actions (A1, A2 and A3), organisations should manage the awareness of BPM from the start and across the entire organisation. This is necessary for staff to participate in the implementation journey and because people are the drivers of change (Jeston & Nelis 2006). Therefore, Action A4 applies. A sound understanding of BPM will enable implementation and interaction amongst staff. Condition C3 was also prominent in the 'strategy' theme and supports Action A4. Organisations should nurture the development of process understanding, and conditions should favour the related processes because it is crucial to BPM adoption.

Align: To the right of the envelope is the 'align' theme. The research presented BITA as a main theme and concern. FIN acknowledges that they struggled to build relationships and trust between business and IT, and they acknowledge that they are interdependent. BITA was challenging since the inception of the BPM programme, and it is still a concern today. However, they are positive that the relationships in BITA context are maturing. The actions and conditions plotted here support the notion. The IT implementation was highly complex, and the business is critically dependent on it. System outages severely complicated BITA efforts. The topic will be covered in the second part of the study.

BPM enables business to operate more efficiently. However, the research found that emphasis was on the delivery of technical solutions and therefore on the project outputs and not on the optimisation of operational processes. Greater emphasis on process optimisation would inherently align more with BPM practice. Moreover, when projects are scoped, the main focus does not always align with process improvement. Consequently, condition C5 is isolated.

Conclusion

BPM is a maturing practice, which harbours great potential to provide companies with a competitive advantage. The research aimed to provide information in support of the linkage between the strategy and task levels in a BPM implementation environment. According to the literature, factors which contribute to BPM success are not very well researched. The research project set out to address this gap in the literature with a pragmatic approach in a BPM implementation environment in order to answer the research question. Practical implications were constructed from the data collected during a case study at a company that has been practicing BPM for approximately 5 years. This is expressed by actions and conditions that supported BPM at FIN. The research question is answered by a portion of this constructed view; however, the research produced additional themes that in conjunction with integrating the 'strategic' and 'task' levels are critical for BPM implementations. In a BPM environment, strategic intent and alignment is a key driver to ensure better implementation of the practice. Therefore, well-planned implementation methods and strategic support will enable optimal implementation of BPM. It will be supported by the key building blocks: a clear strategy, an employee base with a mindset that favours BPM and good organisational culture support for BPM. These aspects are critical to successful BPM implementations. All staff should be educated on the methodology and related concepts prior to an implementation undertaking. A clear vision and strategic intent behind the proposed BPM initiative is imperative and should be communicated to all those who are involved. Consequently, BPM is favoured when driven from the strategic level, with particular focus on strategic alignment and BITA.

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Competing interests

The authors declare that they have no financial or personal relationship(s) that may have inappropriately influenced them in writing this article.

Authors' contributions

I.L. (University of Cape Town) and L.S. (University of Cape Town) contributed equally to the writing of this article.

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An empirical study of factors that contribute to the emotional and physical well-being of call centre agents

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Call centre work has been associated with involving high workload, being under performance monitoring, having low autonomy, doing repetitive tasks and requiring a minimal level of skills, and the work is also being performed in an open-plan work environment. The aim of the study was to determine whether certain factors within the work environment of call centres play a role on the emotional and physical well-being of call centre agents. The study also aimed to investigate whether there was a significant relationship between these factors and well-being. The study employed a quantitative research paradigm, and data were gathered by means of a structured questionnaire administered to a sample of call centre agents ($n = 275$) from four companies located in the Cape Metropole, South Africa. The main findings showed that factors in the work environment, such as a lack of skills variety, low autonomy, task identity, lack of social support, job demand, performance monitoring, temperature and air quality as well as workstation layout, contribute negatively to emotional (burnout and stress) and physical (optical and auditory health problems) well-being. The findings yielded statistically significant relations between these factors and emotional and physical well-being. One of the recommendations of the study is that call centre organisations should have supportive human resource policies in place that offer training and development, present promotion opportunities and promote supervisor support.

Introduction

A call centre has a work environment in which the main business is mediated by computer- and telephone-based technologies that enable an efficient distribution of incoming or outgoing calls to available employees (Holman *et al.* 2005). Call centres are important constituents of services that organisations offer to customers by means of solving problems, resolving complaints and providing information (Lywood, Stone & Ekinci 2009). The call centre industry in South Africa has grown, and with the high unemployment rate in the country, this industry offers a means of creating jobs, and foreign investment is also stimulated (Banks & Roodt 2011). The call centre industry provides inexperienced graduates and matriculants employment opportunities, as no formal qualification and skills are needed because training is provided by the organisation (Benner, Lewis & Omar 2007). Against the preceding background it is evident that call centres are cost-effective for organisations to deliver a service to customers. However, this industry is characterised by factors such as low autonomy, lack of task variety, high levels of performance monitoring and high job demands that contribute to stress and negative well-being (Holman *et al.* 2005). Because of the demands of call centre work, this type of work is often associated with burnout, stress and other health-related problems, which are most likely caused by various factors within the work environment of call centres. The core objective of the study was to investigate factors, which may trigger certain emotional and physical well-being problems in the workplace, in order to propose measures to the call centre management to help improve the work environment in call centres in general.

Literature review

A range of factors that have an impact on the physical and emotional well-being of call centre agents have been identified by a number of researchers. The factors include, for example, skills variety, autonomy, task identity, social support, job demand, performance monitoring, temperature and air quality and workstation layout. Each of these factors will be explained in brief in this article. Skills variety refers to the extent to which a variety of skills and abilities are required to perform a job and make it challenging (Malhotra, Budhwar & Prowse 2007). Call centre work needs a limited skills variety and complexity, and it is found that these low levels of skills are associated with low levels of affective commitment (Aksin, Armony & Mehrotra 2007). When it comes to autonomy, call centre agents have a limited autonomy over their work tasks and working environment; they cannot use their discretion over the methods they use, how tasks

are completed and the time allocation of their work (Comcare 2006). Because of the lack of task variety, the work tends to be monotonous and repetitive. It was found that when there is no variety in tasks and when repetition occurs, employees more likely experience low levels of cognitive arousal, which results in disengagement from the job (Warr 2007). The job demands placed on call centre agents in terms of customer service delivery, which is associated with high levels of stress, may take a toll on these agents (Holman 2003; Pillay, Butendach & Kanengoni 2014). Dean and Rainnie (2008) found that efficiency demands of call centre work are linked to performance in terms of time pressures associated with workload. Performance monitoring focuses on the number of calls handled during the work hours, which provides data on the number of calls waiting, the proportion of calls answered, the average call duration and the customer waiting time (Banks & Roodt 2011). According to Visser and Rothmann (2008), performance monitoring is viewed as a job demand and is associated with negative employee well-being.

Workplace social support, on the other hand, focuses on the impact of support received from supervisors or team leaders and colleagues in the form of problem solving, sharing information, reappraising situations and obtaining advice (Brough & Frame 2004). Supervisor support can either be a source of support or strain for call centre agents (Cappelli 2008). Lack of social support in the workplace is strongly linked to burnout (Maslach, Schaufeli & Leiter 2001). The temperature in a call centre, whether hot or cold, will affect the efficiency and quality of work. According to Seppänen, Fisk and Lei (2006), the indoor temperature affects several human responses, including thermal comfort, perceived air quality, sick building syndrome and work performance. If call centres are humid then it has a direct effect on the health of a call centre employee and his/her work performance (Nor Ruslan *et al.* 2014). When it comes to workstations and its ergonomic construction, high workstation panels are related to physical and visual discomfort if they are not adjustable (Comcare 2006). Employees should be able to adjust to the interior of their workstation features, giving them more space to arrange furniture and equipment, which in turn decreases stress and overall discomfort (Knoll 2010).

Research design and methodology

In terms of achieving the core objective of the study, a quantitative research method was used. Quantitative researchers asserted that research must be limited to what we can observe and measure objectively (Welman, Kruger & Mitchell 2006:6). This approach proved apt for a study of this nature.

Four call centres participated in the study with a combined target population of 760. Roasoft® Incorporated calculation tool suggested a sample of 200 participants. Whilst the aforesaid sample size was adequate for the study, overall, responses from 275 call centre agents were recorded. Most of the call centre agents who participated in the study were females (61.8%). Male participants thus constituted only

38.2%, and the age of the call centre agents ranged from 21 to 65 and older, which are limitations of the study. As mentioned, the combined population size of the four call centres who participated in the study was 760. Out of this population, only 275 respondents participated in the study. The results can thus not be generalised to all call centres in the Cape Metropole but is confined to the case study centres only. A structured questionnaire, developed by using existing measuring instruments used in previous research studies, was administered in the study. The demographic section comprised of basic information pertaining to gender, race, age, industry, years of employment, shifts and working hours, smoking habits and exercise.

Job characteristics were measured by using the job dimensions ($\alpha = 0.73$) and the critical psychological state ($\alpha = 0.73$) sections of the Job Diagnostic Scale developed by Hackman and Oldham in 1975. Social support was measured by using a 5-point scale based on the instrument developed by Caplan, Cobb, French, Van Harrison and Pinneau in 1975 (Fields 2002). The reliability of the scale was 0.82. Job demands were measured by using a 5-point scale ($\alpha = 0.82$) developed by Karasek in 1979 (Fields 2002). Performance monitoring was measured by using a 5-point scale ($\alpha = 0.71$) developed by Sprigg, Smith and Jackson (2003). The physical work environment was measured by using a 5-point scale ($\alpha = 0.93$) developed by Sprigg *et al.* (2003). Burnout was measured by using a 5-point Oldenburg Burnout Inventory ($\alpha = 0.87$) developed by Demerouti and Bakker (2007). Vocal health ($\alpha = 0.87$), optical health ($\alpha = 0.90$) and auditory health ($\alpha = 0.81$) were measured by using a 5-point scale developed by Sprigg *et al.* (2003). Job stress was measured by using the 5-point NIOSH Generic Job Stress Scale ($\alpha = 0.93$). The SurveyMonkey software tool was used to compile and complete the structured questionnaire. Data were interpreted by using the Statistical Package for Social Sciences (SPSS). For the purpose of the study, the analysis of variance (ANOVA) technique was used to test the relationships between variables and determine the factors that contribute negatively to emotional and physical well-being of call centre agents in the work environment (National Institute for Occupational Safety and Health, 1988).

Results

ANOVA analysis

The results from the ANOVA analysis presented in Tables 1 and 2 illustrate the factors in the work environment that are linked to exhaustion and disengagement. The results from the ANOVA analysis presented in Table 3 illustrate the factors in the work environment that are linked to physical health problems. The results showed that there is a statistical relationship between skills variety and exhaustion, $F(1,196) = 6.119$, $p = 0.014$, skills variety and disengagement, $F(1,196) = 41.150$, $p = 0.000$, and skills variety and optical health, $F(1,187) = 4.541$, $p = 0.034$. There is a statistical relationship between autonomy and disengagement, $F(1,196) = 4.256$, $p = 0.040$. There is a statistically significant relationship between task variety and anxiety, $F(1,187) = 4.092$, $p = 0.045$. There is a statistically

TABLE 1: ANOVA results for exhaustion.

Source	df	F	Sig.
Skills variety	1	6.118	0.014
Job feedback	1	1.904	0.169
Task variety and identity	1	0.251	0.617
Autonomy	1	3.094	0.080
Supervisory support	1	7.030	0.009
Job demands	1	32.827	0.000
Performance monitoring	1	4.472	0.036
Workstation	1	0.224	0.636
Temperature and air quality	1	0.421	0.517

Source: Statistical Consultant, CPUT, 2013

TABLE 2: ANOVA results for disengagement.

Source	df	F	Sig.
Skills variety	1	41.150	0.000
Task variety and identity	1	0.168	0.683
Autonomy	1	4.256	0.040
Supervisory support	1	2.529	0.113
Job demands	1	0.884	0.348
Performance monitoring	1	2.335	0.128
Workstation	1	1.673	0.197
Temperature and air quality	1	5.166	0.024

Source: Statistical Consultant, CPUT, 2013

TABLE 3: ANOVA for physical well-being.

Source	Dependent variable	df	F	Sig.
Skills variety	Optical health	1	4.541	0.034
Task identity	Anxiety	1	4.092	0.045
Supervisory support	Optical health	1	5.760	0.017
Job demands	Vocal health	1	5.986	0.015
	Optical health	1	7.828	0.006
	Auditory health	1	5.455	0.021
	Physical and behavioural stress symptoms	1	4.280	0.040
Performance monitoring	Auditory health	1	12.093	0.001
Workstation layout	Auditory health	1	11.014	0.001

Source: Statistical Consultant, CPUT, 2013

significant relationship between supervisory support and exhaustion, $F(1.196) = 7.030$, $p = 0.0009$, and supervisory support and optical health, $F(1.187) = 5.760$, $p = 0.017$. There is a statistically significant relationship between job demands and exhaustion, $F(1.196) = 32.827$, $p = 0.000$, job demands and vocal health, $F(1.187) = 5.986$, $p = 0.015$, job demands and optical health, $F(1.187) = 7.828$, $p = 0.006$, job demands and auditory health, $F(1.187) = 5.455$, $p = 0.021$, and job demands and physical and behavioural stress symptoms, $F(1.187) = 4.280$, $p = 0.040$. There is a statistically significant relationship between performance monitoring and exhaustion, $F(1.196) = 4.472$, $p = 0.036$, and performance monitoring and auditory health, $F(1.187) = 12.093$, $p = 0.001$. There is a statistically significant relationship between temperature and air quality and disengagement, $F(1.196) = 5.166$, $p = 0.024$. There is a statistically significant relationship between workstation and auditory health, $F(1.187) = 11.014$, $p = 0.001$.

Discussion

The core objective of the study was to explore which factors in the work environment contribute negatively to emotional

and physical well-being. The study showed that the lack of skills variety was a factor that contributed to burnout and optical health problems. The study agrees with Visser and Rothmann (2008) that low levels of skills variety are positively linked to burnout. It also concurs with Sprigg *et al.*'s (2003) study that the lack of knowledge and training on how to adjust computer display screen can lead to optical health problems. Call centre agents with insufficient skills and training of computer systems and new product knowledge can experience low morale and burnout when dealing with demanding customers. Because call centre agents stare into the computer screen intensively, not knowing how to adjust the contrast and brightness of the screen can lead to optical health problems.

It was shown that the lack of autonomy contributes to disengagement. Feelings of not being listened to, not being able to give inputs on decisions (Priebe *et al.* 2005) and not conducting work on one's own terms (Vekkaila, Pyhältö & Lonka 2014) can lead to disengagement. Call centre agents who experience a lack of autonomy will feel less committed to complete their tasks and cannot use their own discretion on how to handle customer queries, resulting in them being disengaged from the work tasks. Task identity, on the other hand, is linked to anxiety. According to Lin and Hsieh (2002), a mismatch between task identity and employees' abilities occurs when task identity requires employees to elevate their abilities. In some call centres, task identity allows the employee to complete a task from beginning to end without sending it to the back office. However, if the agent is stressed by the task or by the demands of the customer along with reaching performance targets in an allocated time, this can lead to anxiety. Lack of social support (supervisory) contributes to exhaustion and optical health problems. Having supervisors who do not support or care about employees and who create an unpleasant work environment for employees is associated with emotional burnout (Lambert *et al.* 2012). Call centre agents should be encouraged by their supervisors to take regular breaks, away from computer screens, to prevent the risk of visual disorders (Sprigg *et al.* 2003). The role of the supervisors in call centres should not just be to monitor the performance of call centre agents, but they should be able to coach, motivate and support employees to develop and reach their full potential.

The study found that high job demands are associated with exhaustion, vocal and auditory health problems, and physical and behavioural stress symptoms. The study agrees with Toomingas *et al.*'s (2005) study that call centre work is demanding on the hearing of call centre agents, as a large proportion of the work consists of listening to customers on the telephone. Wearing headsets is a requirement of call centre work, and often sharp noises, known as acoustic shock, penetrate through the headsets causing uncomfortable pain in the ear. Call centre agents rely on their voices to carry out their work and are at the risk of vocal disorders because of work-related excessive oral communication (Vilkman 2004). Because of the vocal demands of call centre work, agents

are forced to handle a high call volume, which results in excessive talking. This excessive handling of calls coupled with the background noise results in raising their voices so that customers can hear them, and also poor air quality, which causes dryness in the throat, can lead to vocal strain. The demands of performance targets can cause call centre agents to feel pressurised and stressed (Taylor *et al.* 2003). Call centre work is performance-based, which is linked to monetary value, and because of this fact, call centre agents stress about achieving the performance targets, delivering an efficient service and meeting the demands of customers.

The results suggest that performance monitoring is linked to exhaustion and auditory health problems. The finding is consistent with Castanheira and Chambel's (2010) study that performance monitoring is associated with exhaustion and the negative effects of these monitoring systems occur because of the fact that their job demands are high and they have low autonomy. In call centres, performance monitoring is associated with financial rewards and an agent's appraisal is often based on his/her performance rating. Owing to the financial factor, agents feel that they have no control and involvement in deciding over how much their payment increase will be or whether they will in fact get an increase, as this is decided by their performance ratings. Therefore, they need to achieve those high targets by taking an excessive number of calls, which ultimately gives them ear problems as they constantly wear their headsets.

Temperature and air quality are linked to disengagement. Office temperatures that are too hot or too cold as well as poor air quality can lead to a decrease in productivity (Pitzer 2006). Call centre agents have no control over the temperature in the office as the air-conditioning system is centralised. The open-plan office layout of the call centre working environment is often over populated with call centre agents occupying the space, which results in an increase in heat and poor quality of air. The uncomfortable temperature and poor air quality can lead to a decrease in productivity, as employees feel disengaged and lethargic. Workstation layout is linked to auditory health problems. The open-plan office environment in call centres are filled with significant background noise. When the background noise is high, call centre agents need to turn up the volume of their headsets, increasing the risk of exposure to acoustic shock (Westcott 2006). The workstations in the call centre environment are in close proximity to each other without any sound-absorbing partitioning between them. Along with the overcrowding in the office layout, agents talking simultaneously can lead to excessive noise levels, which makes it difficult for the call centre agent to hear the customer at the other end of the line and to concentrate on the call, resulting in the headset volume being turned up.

Recommendations

Training on new products should be provided on a regular basis, enabling call centre agents to acquire new skills. Call centre organisations should have supportive human

resources policies in place which offer training and development, present promotion opportunities and promote supervisor support. Call centre management should reconsider the work design (low task variety, low autonomy, performance targets and performance monitoring) of the call centre environment by allowing call centre agents more autonomy when it comes to the task at hand. In this way, they will cope with the job demands, and burnout and stress will be alleviated. Call centre agents should be allowed to give inputs on the work design, performance targets and monitoring as they know the systems better and can give valuable inputs on what works well and what should be changed. This feedback should be reviewed and implemented where needed, which will give call centre agents a sense of meaningfulness and will also increase work commitment. Performance targets should be based on quality service and not the amount of calls that can be taken. This will in turn eliminate high job demands. Performance monitoring should be used as a developmental tool, whereby call centre agents can expand on their skills, and should not be used to evaluate financial incentives. Workstations should have sound absorption panels which block out background noise, and this will ensure that the customer will be heard without the call centre agents adjusting the volume on their headsets. Training should be provided on how to adjust the screen controls and brightness on monitors, display screen equipment (DSE) and visual screen units (VSE). Regular short breaks should be taken to allow the agents some reprieve from continuously staring at computer screens. Air and temperature control should be at a comfortable level for all employees, and workstations should not be situated directly under the air-conditioning vents.

Conclusion

Call centre agents are important people within the customer service industry. For this industry to be viable and profitable, the management should see call centre agents as an asset. Therefore, it is important for organisations to change their work design, change aspects of the physical work environment and implement human resource policies that will alleviate the pressure that these agents experience. Implementing these measures will promote positive emotional and physical well-being.

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Competing interests

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Authors' contributions

N.M. (Cape Peninsula University of Technology) is the core author of this article and R.H. (Cape Peninsula University of Technology) contributed by means of having proofread and implementing minor edits.

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Capital structure and company performance: The case of free zone companies in Ghana

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The study investigates the effect of tax savings on the capital structure of free zone companies in Ghana. Using a panel regression model, the study specifically examines the determinants as well as the effect of capital structure on the financial performance of these companies. The study used data from annual reports of these companies from 2009–2012. The results of the study show that tax has a positive and significant relationship with the capital structure of the free zone companies, and even though the companies do not pay corporate tax for the first 10 years, they operate in Ghana and pay the lowest corporate tax after the first 10 years. The regression results also show that the age of the company, size, profitability and company risk are important in influencing the decisions on the capital structure of the free zone companies. Capital structure of the companies has an inverse relationship with return on asset, which measures the financial performance of these companies. The study provides useful recommendations for policy direction and to managers of these companies.

Introduction

Capital structure refers to a company's financial framework, which consists of the debt and equity that are used to finance the company. Capital structure is essential in determining how a company finances its overall operations and growth by using different sources of funds. The modern theory of capital structure originated from the groundbreaking contribution of Modigliani and Miller in 1958, under the perfect capital market assumption that if there is no bankruptcy cost and capital markets are frictionless and without taxes, the company's value is independent of the structure of the capital. In 1963, Miller and Modigliani modified the assumptions to include tax because the use of debt reduces the amount of tax a company has to pay and increases the value of the company. At the corporate level interest on debt is generally deductible from the taxable income, and this provides companies with an incentive to finance their operations with debt rather than equity, especially in countries that levy high tax (Graham 1996, 2000; MacKie-Mason 1990). The relationship between company performance and capital structure has succeeded in attracting a good deal of public interest because it is a tool for socio-economic development. Also when there is good company performance and capital structure, there will be a proper and efficient practice in the administration of business entities.

The Ghana Free Zones programme was established by an *Act of Parliament (Act 504)* in 1995 to promote export-oriented investment in Ghana. It is an integrated programme, which promotes the processing and manufacturing of goods through the establishment of export processing zones and encourages the development of commercial and service activities in the seaport and airport areas. Companies in Ghana registered under the free zone programme enjoy 100% exemption from paying income tax on profits for the first 10 years, and this tax does not exceed 8% thereafter. The three main goals for which the government establishes free zones are: to provide a country with foreign exchange earnings by promoting non-traditional exports; to create jobs and generate income; and to attract foreign direct investment, technology transfer, knowledge spillover, demonstration effects and backward linkages (<http://www.gfzb.gov.gh>).

Problem statement

In Ghana a number of researches have been carried out on the determinants of capital structure (Abor 2008; Abor & Biekpe 2004; Amidu 2007; Boateng 2004), capital structure and firm performance (Abor 2005; Kyereboah-Coleman 2007), stock market and capital structure (Bokpin & Isshaq 2008), and the role of debt in balance sheet (Aboagye 1996), amongst others. None of these studies focused on capital structure and performance of free zone companies in Ghana which provided employment to 30 080 employees and contributed \$10 104.63 million to Ghana's export in 2011. In addition, the tax-based theory suggests that in a world with corporate taxes, the tax deductibility of interest for corporations creates a clear preference for debt in the corporate

capital structure. Therefore, companies that are highly levered are supposed to outperform their counterparts that are less levered. However, free zone companies do not pay corporate tax for 10 years of operation and also fall within a lower tax bracket (i.e. 0%–8%) after the 10-year period. The non-free zone companies in Ghana pay a corporate tax of about 25%. The absence of corporate tax for 10 years and a very low tax rate after the first 10 years provide a unique environment in which the capital structure theory can be tested to unearth whether the use of debt actually contributes to the value of the company.

Research objectives

The main objective of this study was to investigate how tax savings influence the capital structure of free zone companies in Ghana.

The specific objectives of the study were the following:

1. To examine the determinants of capital structure of these companies
2. To examine the financial performance of the free zone companies.

Significance of the study

The study seeks to examine the effect of tax savings on the capital structure of free zone companies in Ghana. The results of this study will help researchers know whether Miller and Modigliani modified assumptions on capital structure to include tax shield holds in Ghana. If it does not hold, researchers can investigate further what influenced the capital structure of these companies. The study will also add to the existing literature on the capital structure and performance of companies in Ghana. It will also inform managers of these companies on their financial performance and the steps to be taken to be competitive on the international market, as approximately 70% of their products and services are exported.

Review of literature

An appropriate capital structure is a critical decision for any business organisation. The decision is important not only because of the need to maximise returns to various stakeholders, but also because of the impact such a decision has on a company's ability to deal with its competitive environment. The prevailing argument originally developed by Modigliani and Miller (1958) was that an optimal capital structure existed that balanced the risk of bankruptcy with the tax benefits of debt. Once established, the capital structure should provide greater returns to stakeholders than they would have received from all equity companies. The successful selection and use of capital is one of the key elements of the firms' financial strategy (Kajananthan 2012; Velnampy & Niresh 2012). Brander and Lewis (1986) and Maksimovic (1988) provided the theoretical framework that links capital structure and market structure. Contrary to the profit maximisation objective postulated in the literature on

industrial organisation, these theories are similar to corporate finance theory in which it is assumed that the company's objective is to maximise the wealth of its shareholders. Furthermore, market structure is shown to affect capital structure by influencing the competitive behaviour and strategies of companies. According to Kajananthan (2012), Achchuthan, Kajananthan and Sivathaasan (2013), and Kajananthan and Achchuthan (2013), capital structure is related to corporate governance practices regarding liquidity.

Abor (2005) reviewed the impact of capital structure on profitability of the 22 companies listed in the Ghana Stock Exchange from 1998 to 2002. Results showed that there was a positive and significant relationship between capital structure (total debt to total assets (TDTA) ratio) and return on equity (ROE). Abor also indicated that profitable companies have more dependence on financing through liability, and a high percentage (85%) of the liabilities of these companies are of short-term. Abor (2008) compared the capital structures of publicly quoted firms, large unquoted firms, and small and medium enterprises (SMEs) in Ghana. The study also examined the determinants of capital structure decisions amongst the three sample groups. The regression results indicated that age of the firm, size of the firm, asset structure, profitability, risk and managerial ownership are important in influencing the capital structure decisions of Ghanaian firms. Jensen and Meckling (1976) drew attention to the impact of capital structure on the performance of enterprises, number of tests as an extension port to inspect the relationship between performance of firm and financial leverage. However, the results documented were contradictory and mixed. Some studies have reported that positive relationships (Ghosh *et al.* 2000) also support the argument. Several others have reported a negative relationship between debt and financial achievement like Fama and French (1998) and Simerly and Li (2000). Capital structure is said to be closely linked to the financial performance (Zeitun & Tian 2007). San and Heng (2011), in their research, studied the relationship between capital structure and corporate performance of Malaysian construction sector from 2005–2008. In this study, 49 companies were selected as samples. Results showed that there was a significant relationship between capital structure and corporate performance.

Aburub (2012) in his research investigated the impact of capital structure on the firm performance of companies listed in the Palestine Stock Exchange from 2006–2010, in which 28 companies were selected as samples. In this study, ROE, return on assets (ROAs), earnings per share (EPS), market value to book value of equity ratio (MVBR) and Tobin Q ratio as five measures of accounting and market of firm performance evaluation and also as dependent variables, and short-term debt to total assets (SDTA) ratio, long-term debt to total assets (LDTA) ratio, total debt to total assets (TDTA) ratio and total debt to total equity (TDTQ) ratio as four measures of capital structure and also as the independent variables were selected. Results indicated that the capital structure has a positive effect on firm performance evaluation measures.

Onaolapo and Kajola (2010) investigated the effect of capital structure on financial performance of companies listed in the Nigeria Stock Exchange. This study was performed on 30 non-financial companies in 15 industry sectors in a 7-year period from 2001–2007. The results showed that the capital structure (debt ratio, DR) has a significant negative effect on financial measures (ROA and ROE) of these companies. Fosberg and Ghosh (2006) in the research conducted on the 1022 companies in the New York Stock Exchange (NYSE) and 244 companies in the America Stock Exchange (AMEX) concluded that the relationship between capital structure and ROA was negative. Houang and Song (2006), in the research conducted on 1200 Chinese companies during 1994–2003, concluded that financial leverages had a negative relationship with ROA and growth opportunities. Andersen (2005) reviewed the relationship between capital structure and firms performance for 1323 companies from various industries and concluded that there was a significant relationship between capital structure and ROA. Elsayed Ebaid (2009) studied the effect of capital structure on the performance of 64 Egyptian companies from 1997 to 2005. The results suggested that there was a significant negative relationship between ROA and TDTA ratio, but there is a non-significant relationship between ROE and TDTA ratio. Mramor and Crnigoj (2009) concluded that there was a significant negative relationship between financial leverage (TDTA ratio) and ROA ratio. A number of empirical studies have identified company-level characteristics that affect the capital structure of companies. Amongst these characteristics are age of the company, size of the company, asset structure, profitability, growth, company risk, tax and ownership structure.

Methodology

Data collection and source

Data on capital structure and company performance were collected from secondary sources, annual reports of 50 free zone companies for the period of 2009–2012.

Research hypothesis

To examine the determinants of capital structure of the free zone companies the following hypotheses were tested:

- H₁: there is a positive relationship between size and capital structure of the company.
- H₂: there is a negative relationship between profitability and capital structure of the company.
- H₃: there is a positive relationship between asset structure (collateral) and capital structure.
- H₄: there is a positive relationship between corporate tax rate and capital structure of the company.
- H₅: there is a positive relationship between company age and capital structure of the company.
- H₆: there is a negative relationship between company risk and capital structure.

The capital structure of the company was measured by the DR.

To examine the effect of the capital structure on the financial performance of the free zone companies, the following hypotheses were tested:

- H₁: there is a negative and significant relationship between debt ratio and company performance.
 - H₂: there is a positive and significant relationship between asset turnover ratio and company performance.
 - H₃: there is a positive and significant relationship between company size and performance.
 - H₄: there is a positive and significant relationship between company age and performance.
 - H₅: there is a positive and significant relationship between growth opportunities and company performance.
 - H₆: there is a negative relationship between quick ratio and company performance.
- Measure of company financial performance is ROA.

To test the hypotheses on the determinants of capital structure, the study used Abor's (2008) research model, in which he used the dependent variable, long-term DR as the capital structure and size, profitability, age, tax, asset structure and operation risk as explanatory variables.

Model specification

A panel regression model was used for the estimation in this study. Panel data involve the pooling of observations on a cross section of units over several time periods. A panel data approach is more useful than either cross-section or time series data alone. One advantage of using the panel data-set is that because of the several data points, the degrees of freedom are increased and collinearity amongst the explanatory variables is reduced; thus, the efficiency of economic estimates is improved. Panel data can also control for individual heterogeneity due to hidden factors, which, if neglected, in time series or cross-sectional estimations, leads to biased results (Baltagi 1995). The panel regression equation differs from a regular time series or cross-sectional regression by the double subscript attached to each variable. The general form of the model can be specified as:

$$Y_{it} = \alpha + \beta X_{it} + e_{it} \quad (1)$$

Where the subscript i denotes the cross-sectional dimension and t represents the time series dimension. The left-hand variable, Y_{it} , represents the dependent variable in the model, which is the company's DR. X_{it} contains the set of explanatory variables in the estimation model, α is the constant and β represents the coefficients. The model for the empirical investigation of the capital structure is as follows:

$$\begin{aligned} \text{LDR}_{it} = & \beta_0 + \beta_1 \text{SZ}_{it} + \beta_2 \text{PR}_{it} \\ & + \beta_3 \text{CO}_{it} + \beta_4 \text{TX}_{it} + \beta_5 \text{OR}_{it} + \beta_6 \text{AG}_{it} \end{aligned} \quad (2)$$

Where:

LDR_{it} = DR (long-term debt/equity + debt) for company i at time t ;

SZ_{it} = The size of the company (log of sales) for company i at time t ;

PR_{it} = Earnings before interest and tax divided by total asset for company i at time t ;

CO_{it} = Tangible fixed asset + inventories divided by total assets of company i at time t ;

TX_{it} = Ratio of tax paid to operating income for company i at time t ;

OR_{it} = Squared difference between the company's profitability and the cross-sectional mean of profitability for company i at time t ;

AG = Number of years since inception of the company to observation date.

To test the hypotheses for the effect of the capital structure on the companies' financial performance, Onaolapo and Kajola's (2010) research model was used, where the dependent variables, ROA, as accounting measures for evaluating the company's performance, and independent variable, the DR, as capital structure, were used. They also used variables of asset turnover (TURN), company size (SIZE), company age (AGE), assets tangibility (TANG) and growth opportunities (GROW) as control variables. The research model is as specified below:

$$ROA_{it} = \beta_0 + \beta_1 DR_{it} + \beta_2 TURN_{it} + \beta_3 SIZE_{it} + \beta_4 AGE_{it} + \beta_5 GROW_{it} + \beta_6 QUICK_{it} \quad (3)$$

Where ROA = profit after tax divided by total asset; DR_{it} = total debt divided by total asset; $TURN_{it}$ = sales divided by total asset; $SIZE_{it}$ = natural logarithm of sales; AGE_{it} = number of years since inception of the company to observation date; $QUICK_{it}$ = current asset minus inventories divided by current liabilities; and $GROW_{it}$ = change in the natural logarithm of sales.

Results and discussion

Regression model of determinants of capital structure of free zone companies in Ghana is presented in Table 1. The results show that the size of the company has a positive and statistically significant relationship with the capital structure of the company. Larger companies are more

TABLE 1: Regression results (Model 2).

Variable	β	t	P
Constant	0.2003	0.7040	0.4828
Size	0.1273	2.954	0.0038**
Profitability	-0.6529	-2.7363	0.0072***
Asset structure	-0.1785	-1.1262	0.2624
Tax	4.1412	1.7229	0.0875*
Company risk	0.8538	1.6875	0.0942*
Age	-0.0348	-2.6573	0.0090***
R-squared	0.173	-	-
Adjusted R-squared	0.131	-	-
F-statistics	4.1190	-	-
Prob (F-statistic)	0.0009	-	-
Number of observation	125	-	-

Dependent variable = debt ratio.

***, **, *, represent significance at 1%, 5% and 10%, respectively.

likely to acquire long-term debt finance in their operations. Especially with the free zone companies in Ghana most of the larger companies are multinational companies and are financed by their parent companies on long-term debt. This finding of positive relationship of long-term debt and size is consistent with previous findings (Abor 2008; Al-Sakran 2001; Barclay & Smith 1996; Barton *et al.* 1989; Friend & Lang 1988; Hovakimian *et al.* 2004; Kim *et al.* 1998; MacKie-Mason 1990).

Profitability and long-term debt show a negative and statistically significant relationship. The results of this study clearly support the pecking order hypothesis, in which profitable companies initially rely on less costly, internally generated funds and subsequently look for external resources if additional funds are needed. It is expected that more profitable companies will require less debt finance. This is because profitable companies would have a preference for inside financing over outside debt financing, as the cost of external financing is greater for the company. This is consistent with the findings by Esperança *et al.* (2003), Hall *et al.* (2004) and Abor (2008).

Tax was found to have a statistically significant positive relationship with long-term DR amongst free zone companies. This suggests that free zone companies with high tax rates rely more on long-term debt. This finding is very interesting because these free zone companies pay the lowest tax rate in Ghana. For the first 10 years of operation, these companies do not pay corporate tax at all and even after the first 10 years the tax ranges from 0%–8%, depending on the company's location and type of business. The results indicate that free zone companies do not take into consideration the tax savings enjoyed when applying for debt financing. The result is contrary to the findings of Abor (2008) who found a significant and negative association between tax and long-term DRs of quoted companies in Ghana. Thus, the tax-based theory does not hold in Ghana for free zone companies.

The results show a positive and statistically significant relationship of company risk with long-term DR at the 10% level, implying that companies with high risk exhibit high DR. This could be due to the fact that most of these

TABLE 2: Regression results (Model 2).

Variable	β	t	p
Constant	-0.0815	0.4994	0.6187
Debt ratio	-0.1191	-2.8268	0.0058***
Asset turnover	0.009	0.1562	0.8762
Size	0.0165	0.6484	0.5183
Age	0.0062	1.0817	0.2821
Quick ratio	-0.0002	-0.5879	0.5580
Company growth	0.0096	1.677008	0.0969*
R-squared	0.134	-	-
Adjusted R-squared	0.078	-	-
F-statistics	2.404	-	-
P (F-statistics)	0.033	-	-
Durbin-Watson	1.89	-	-

Dependent variable = return on asset (ROA).

***, * represent significance at 1% and 10%, respectively.

companies are funded on loan by their parent companies and not by the banks which will not give long-term debt to high-risk companies. Age and long-term debt have a positive and statistically significant relationship. These companies do not have access to public equity market because they are not listed in the stock exchange. As a result, long years of business could connote long business relationships with external debt providers and increase their chances of acquiring external long-term debt finance.

TABLE 3: Investigated companies in research.

Name of company	Nature of activity
Asanska Jewelry	Jewelries
L'Oréal West Africa	Beauty products
Belshina Tire Solution Ltd	Import and export of heavy duty tires
Red Sea Housing (Gh) Ltd	Prefabricated building
Gold Coast Fruits Ltd	Fruit processing
Gold Recovery Ghana Ltd	Processing of gold waste
Globalpak Ltd	Polypropylene sack
Canada Optical Laboratories Ltd	Optical lenses
Jei River Farms	Fruit processing
Pan Afro King Company Ltd	Wood processing
SRG Industries Ghana Ltd	Plastic products
Pioneer Foods Cannery Ltd	Fish processing
Ayum Forest Products Ltd	Wood processing
F.A. Fally Ghana Ltd	Tissue paper
Bomart Farms Ltd	Fruit processing
Blowsack Industries Ltd	Polypropylene sacks
Vehrad Import & Export Co. Ltd	Haulage
Non Ferrous Metals Gh Ltd	Lead recovery
HPW Fresh & Dry Ltd	Fruits and vegetables
Cocoa Processing Company Ltd	Cocoa processing
Peelco Ltd	Fruit processing
Continental Export Ghana Ltd	Seafood
Flemingo International Ltd	Duty-free shop
Diplo FZE Ltd	Duty-free shop
Intelligent Card Production	Magnetic smart card
FMC FZCO Ltd	Commercial trading
Logs & Lumber Ltd	Wood processing
Golden Exotics Ltd	Fruit processing
Danica Plastics Ltd	Plastic products
Praise Export Services Ltd	Food processing
Kpone Lobster Ltd	Sea food
Unifruit Ltd	Fruit processing
Evans Timbers Ltd	Wood processing
International Packaging	Packaging products
Decorplast Ltd	Plastic products
Rubber Plantation	Processing rubber into latex
Lewadis	Commercial trading
Blue skies Products Ltd	Fruit processing
Comet Ghana Ltd	Duty free shop
Birim Wood Complex Ltd	Wood processing
Modern Wood Ltd	Wood processing
Pakmart Ltd	Duty free shop
ARN Manufacturing Ltd	DVD, CD, VCD manufacturing
Quintiles West Africa Ltd	Clinical research
Vegpro Ghana Ltd	Horticultural crops
ACS-BPS	Data processing
Mim Cashew & Agricultural Products Ltd	Cashew processing
Plot Enterprise Ltd	Cocoa processing
Blowplast Industries Recycling Ltd	Plastic waste recycling
Bas Van Bureen Ghana Ltd	Processing of coconut husk

TABLE 4: Descriptive statistics.

Variable	Mean	Standard deviation	Min	Max	Observation
Debt ratio	0.658769	0.481428	0.000767	3.736566	96
Age	10.53125	3.906683	4.000000	19.000000	96
Asset structure	0.397692	0.255566	0.002984	0.992414	96
Asset turnover	268041.9	2626251.	0.006612	25731900	96
Profitability	0.016213	0.164391	-0.669163	0.544344	96
Company growth	0.519565	1.374271	-0.661440	12.03963	96
Company risk	0.065175	0.067294	0.000000	0.301992	96
Quick ratio	6.907035	55.53959	0.000684	544.7967	96
Size	6.405198	0.846036	3.789510	7.950192	96
Return on asset	0.009107	0.158491	-0.669163	0.451063	96
Tax	0.006149	0.021756	0.000000	0.144082	96

TABLE 5: Correlation matrix with debt ratio as the dependent variable.

Variable	Debt ratio	Age	Asset structure	Company risk	Profitability	Size	Tax
Debt ratio	1	-	-	-	-	-	-
Age	-0.192	1	-	-	-	-	-
Asset structure	0.025	-0.055	1	-	-	-	-
Company risk	0.123	-0.164	0.064	1	-	-	-
Profitability	-0.271	0.219	-0.316	-0.185	1	-	-
Size	0.134	0.237	0.181	-0.326	0.049	1	-
Tax	0.011	0.554	-0.149	-0.149	0.130	0.031	1

TABLE 6: Correlation matrix with ROA as the dependent variable.

Variable	ROA	Debt ratio	Quick ratio	Company growth	Age	Size	Asset turnover
ROA	1	-	-	-	-	-	-
Debt ratio	-0.358	1	-	-	-	-	-
Quick ratio	-0.026	-0.153	1	-	-	-	-
Company growth	0.079	-0.075	-0.025	1	-	-	-
Age	0.185	-0.167	-0.017	-0.166	1	-	-
Size	0.019	0.125	-0.079	0.001	0.160	1	-
Asset turnover	0.018	0.002	-0.012	-0.028	0.041	0.116	1

The effect of the regression model of capital structure on corporate financial performance of free zone companies in Ghana is presented in Table 2. The results show that statistically there is a significant negative relationship between the capital structure or DR and accounting measure of company performance evaluation (ROA) at 1% level. This relationship indicates that the companies that have high DR due to borrowing incur a lot of financial cost, which reduces the net income and hence ROA is reduced. The hypothesis that a company's capital structure should have a negative impact on its performance is confirmed. The results of this hypothesis are consistent with the research results of Onaolapo and Kajola's (2010), Fosberg and Ghosh's (2006), Houang and Song's (2006), Mramor and Crnigoj's (2009) and Zeitun and Tian's (2007) work. Company growth opportunities show a positive and statistically significant relationship with ROA at the 10% level. The results of this hypothesis are not consistent with the results obtained from the researches of Zeitun and Tian (2007) and Onaolapo and Kajola (2010). Size of the company, age, quick ratio and asset structure did not show any significant relationship with ROA.

Conclusion

The study investigated how tax savings influenced the capital structure decisions of free zone companies in Ghana. The study specifically examined the determinants of the companies' capital structure and how the capital structure influenced the financial performance of the companies. The results showed that company size was found to have a positive relationship with long-term debt. The results of the study seem to support the pecking order hypothesis, given that long-term debt has inverse associations with profitability of the companies. It was found that companies with a high-risk profile do not avoid taking more financial risk by using less long-term debt. The results indicate that older companies are more likely to rely on long-term debt finance. This is because they are often perceived to have better reputations with debt finance providers. Tax was found to have a positive relationship with long-term debt, which means that the free zone companies do not take into consideration the tax savings they enjoy when applying for debt in their capital structure.

With regard to the financial performance, the study showed that there is a strong negative and significant relationship between DR and performance measures of free zone companies (ROA). DR determines the financial health of companies. This ratio helps investors to identify risk rate for companies. The company that has a high DR will have a negative impact on company performance and value. Remarkably, free zone companies, by reducing the DR, can increase profitability and thus improve ROA measure. The results also show that there is a significant and positive relationship between company growth opportunities and ROA. Size of the company, age, quick ratio and asset structure did not show any significant relationship with ROA. Given this relationship, it could be noted that DR and company growth are the affecting factors on company financial performance.

Recommendations

The results of the study prove that an increase in leverage negatively affects the ROA. It also recommends that managers should not use excessive amounts of leverage in their capital structure, they must try to finance their projects with retained earnings and use leverage as a last option. Managers of these free zone companies are advised to consider the tax benefit when applying for debt in their capital structure because of the interest deductibility from taxable income at the corporate level. Policy makers should place greater emphasis on the facilitation of equity capital, as it provides a base for further borrowing, reduces businesses' sensitivity to economic cycles and provides companies with an access to syndicates of private and institutional venture capital suppliers because these companies are not listed in the Ghana Stock Exchange.

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Competing interests

The authors declare that they have no financial or personal relationship(s) that may have inappropriately influenced them in writing this article.

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Challenges of financing small, medium and micro-enterprises: The case of Botswana manufacturing sector

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There is acute scarcity of detailed studies of the manufacturing sector in Botswana, especially the financing aspect, hence the need for the study. The study aims at exploring the financing challenges faced by manufacturing small, micro- and medium enterprises (SMMEs). It makes use of 100 questionnaires relevant to manufacturing SMMEs, and structured interviews were conducted with three commercial banks over a period of 8 months. Results show that SMMEs use more of internal financing than external financing because they cannot easily access external financing due to a lack of collateral security, high default rate, poor credit-rating, poor banking history, lack of honest reporting and lack of up-to-date records. It is recommended that commercial banks should offer financing on a case-by-case basis, consider financing SMMEs that have feasible ideas even when they have no collateral security and mentor and guide SMMEs rather than just financing them. SMMEs should keep up-to-date records. SMMEs need to save money for business' future. SMMEs should keep clean banking track record and operate with integrity. SMMEs should separate personal transactions from business transactions to avoid misappropriation of funds. They should also seek help from Local Enterprise Authority, bank officials or competent consultants to ensure they have feasible business plans rather than carry unrealistic dreams. Furthermore, SMMEs need to benchmark with companies in other countries. Commercial banks should develop financing packages that suit firms according to their growth stage. They should consider applications individually. Government should develop policies and incentives to lure financial institutions to finance SMMEs.

Introduction

Globally, small, medium and micro-enterprises (SMMEs) boost Gross Domestic Product and contribute towards unemployment reduction, poverty alleviation and economic diversification and development. SMMEs are the stamina of the mainstream of the world's economies (Rhodes 2012). However, Botswana manufacturing SMMEs are struggling to survive. In the past decade, there has been an enduring debate on SMME development and their contribution to Botswana. The contest has involved SMMEs significance towards employment creation, unemployment reduction, poverty eradication and economic diversification (Okurut, Olalekan & Mangadi 2011). Botswana is located in Southern Africa and has a small population of approximately 2 052 556 people. The country is strategically located at the centre of the southern African region and has potential to supply goods and services to over 200 million people within SADC (Republic of Botswana 2012; World Fact Book 2014). Although there is a big potential market, manufacturing SMMEs like other SMMEs face tremendous challenges that threaten their survival and growth (Jefferis 2014; Moore *et al.* 2010). The main challenges of SMMEs in Botswana include access to markets, financial issues and competitiveness.

In general, however, the main challenges of manufacturing SMMEs include lack of funding, misuse of business funds (Mannathoko 2011), lack of expertise, lack of innovation, no or poor planning, poor management, lack of business acumen, poor and/or no record-keeping on the performance of business, poor quality products, no or inadequate marketing and lack of market (Katz & Green 2011). Borrowing or external funding has not been easy for manufacturing SMMEs as lenders view them as risky (Okurut & Ama 2013). External finance is a paramount part of the market mechanism for the growth and development of any entity regardless of its size. However, access to credit finance by SMMEs in Botswana has been a daunting experience particularly with reference to accessing this credit from commercial banks (Kaplan & Warren 2010; Kapunda 2015; Nkwe 2012).

Access to finance has been reported to play a pivotal role on business start-ups (BIS 2012). Banks prefer financing individual employees with a guaranteed salary rather than SMME owners

without undisputable earnings. So SMMEs struggle to finance their businesses and they end up borrowing at high interests from micro-lenders or do self-finance (Fatoki & Assah 2011). Although scholarly studies have been interested in exploring SMME financing, there are few studies on financing challenges of manufacturing SMMEs in Botswana. Thus, there is scarcity of literature. The study therefore fills in the gap by exploring challenges of financing manufacturing SMMEs in Botswana. The study starts with an abstract, followed by introduction, overview of SMMEs in Botswana: importance and financing perspective, literature review, methodology, results/analysis, conclusion and recommendations.

Literature review

Introduction

In this section the conceptual and theoretical literature review is provided first. The empirical literature review follows. The section ends with a conclusion, which gives a summary of the literature review and indicates how the study differs with others.

Conceptual and theoretical literature review

There are various definitions of SMMEs. The study adopts the Botswana national definition of SMMEs. A 'micro' business is one with six or less employees; they can have a turnover of up to P60 000 a year. A 'small' business is one with less than 25 employees and has an annual turnover of between P60 000 and P1 500 000. A 'medium-sized enterprise' is one with between 25 and 100 employees. They have between 25 and 100 employees and an annual turnover of between P1.5 million and P5 million (Republic of Botswana 1998). Some of the popular and relevant financing theories are The Internal Theory of Industrial Development and The External Theory of Industrial Development.

The internal fund theory of industrial development

The theory postulates that firms are financed internally through retained profits (Kapunda 2015). Neither gross profits nor net profits are used for investment, but rather retained profits and depreciation expense (funds set aside as plant, machinery, motor vehicles, equipment and other assets that lose value over time) (Stevens 1993). Internal financing is cheap (Almeida & Campello 2007) and easily available compared to external financing, which is usual costly in terms of interests and is not easily accessible, and in the event of failure to pay back, it can result in loss of security.

External funds theory of investment

Due to the limited sufficiency of internal funds, the external funds theory of investment suggests that external sources of finance are essential for investment (Kapunda 2015). These include grants, loans, shares, debentures, sales of bonds, strategic partnerships/joint-venturing, factoring, Angel funding and other forms of borrowing (Kaplan & Warren 2010). However, during tough times, firms struggle to

repay loans, sometimes resulting in bankruptcy (Almeida & Campello 2007; Kapunda 2015). The challenges of SMMEs to acquire external finance as expounded by the external funds theory may cause firms to feel more secure using internal financing rather than external financing. Most SMMEs struggle to get external financing, so internal financing may be a better option. Nevertheless, some SMMEs apply both the external funds theory and the internal funds theory. In Botswana, for example, CEDA had to reduce funding during the recession in 2009 as many SMMEs were defaulting on repayments (CEDA 2012; Republic of Botswana 2012). By so doing, it meant that firms that had gotten external funds from CEDA to start and run business had to learn to implement internal funds theory henceforth, saving and ploughing back profits into the firm or else the business collapses. The situation is worsened by Botswana's spiralling household debt, which is causing banks to further get more cautious with lending (African Economic Outlook 2014; International Monetary Fund 2014 Botswana [IMF] 2014).

Empirical literature review

A study was carried out by Acquah and Mosemanegape (2007:1–17) to determine factors influencing SMME performance in Botswana. They evaluated 200 SMMEs in Gaborone, Ramotswa, Tlokweng, Mochudi and Molepolole. It was found that start-up capital and total costs incurred in the business played a vital role in business performance. The researchers therefore recommended the following: entrepreneurs need to be assisted to have access to affordable loans (with reasonable interests) and start-up funds and fund utilization from government agencies needs monitoring and evaluation to improve Botswana SMMEs. In 2007, the Botswana Institute of Development Policy Analysis (BIDPA) carried out a survey on manufacturing SMEs in Botswana. The SME study, which covered a sample of 142 SME firms countrywide, indicates that the role and contribution of SMEs to the economy of Botswana is still very small. In particular, the study indicates that the contribution of SMEs to the economy is still hampered by many factors, such as lack of information on SME programmes due to inadequate publicity of available SME programmes and limited commercial bank financial support for SMEs, which makes SMEs solely dependent on the government for support (BIDPA 2007).

A survey by Okurut *et al.* (2011) on factors influencing credit rationing in Botswana states that SMEs fail to get financing from financial institutions due to poor records, lack of profitability and performance of the SMEs' bank accounts. The researchers recommended capacity building for SMEs. Another study by Okurut and Ama (2013) investigated environmental factors that affect performance of a nationally representative sample of 590 women and youth micro-enterprises in Botswana. Results suggest that lack of capital, poor management and lack of markets are the main challenges of micro-enterprises. However, the studies above are not specifically on manufacturing SMMEs and they major on SMEs and in most cases neglect micro-enterprises, which are covered in the current study. There is no recent available survey of financing challenges of manufacturing SMMEs, which is the essence of the current study by the writers of the paper.

Conclusion

All the studies available tend to focus on small and medium enterprises, thereby leaving out micro-enterprises or involve general SMEs, and none is specific to manufacturing SMMEs, in particular the financing aspect of the manufacturing SMMEs. The study attempts to fill the implied gap.

Methodology

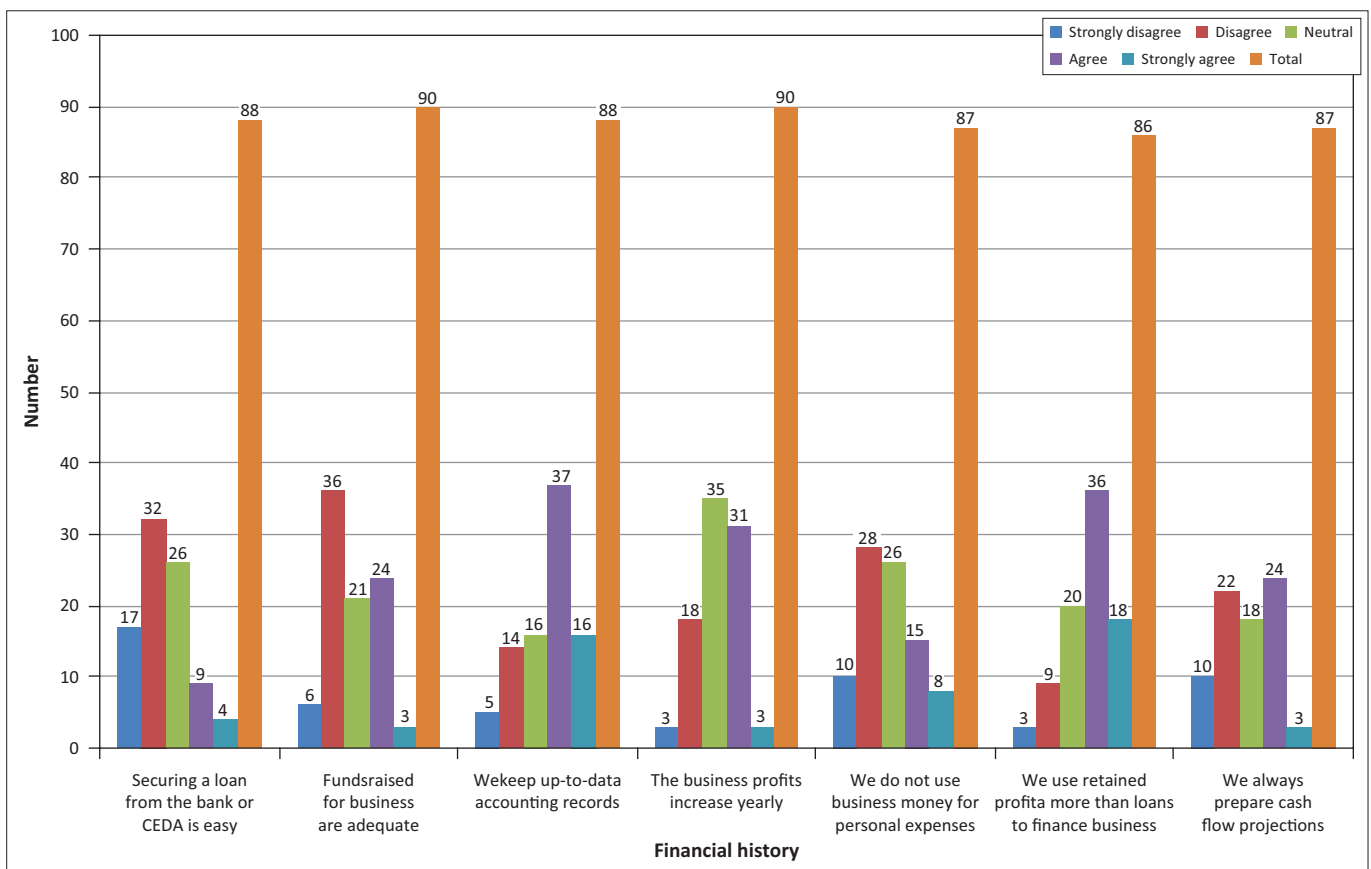
The study was done using geographical cluster sampling on target of 329 manufacturing SMMEs from Local Enterprise Authority (LEA) list of clients and Botswana Exporters Manufacturers' Association from all over Botswana. Geographical cluster sampling was chosen so that results could try to represent the whole country. Cluster sampling refers to a sampling technique where a cluster or group of population elements constitutes the sampling unit, instead of a single element of the population (Lewis, Saunders & Thornhill 2012). The main reason for cluster sampling was that SMMEs tend to locate in urban areas (John Hopkins Bloomberg School of Public Health, 2009). In the study, the population was divided into clusters as follows: Gaborone, Francistown, Maun, Kasane, Serowe and Ghanzi because these are the areas where SMMEs tend to operate. Due to the fact that some of the LEA members could not be reached owing to a lack of contact details, snowballing technique was used where an SMME that fills in a questionnaire is asked to refer the researcher to another SMME owner in

the manufacturing industry. Snowballing technique was chosen as it is regarded as unbiased. One hundred SMMEs responded to the questionnaire. That made the final sample of SMMEs. A structured interview of three commercial banks was also administered. The three commercial banks were chosen out of a possible seven because the banks are SME focused. The banks include Capital Bank, Bank of Baroda and Stanbic Bank. All the banks reside in Gaborone, the capital city of Botswana, but have branches in other urban centres across the country. Before the banks were involved in the survey, permission to research was sought by the researcher from the Ministry of Finance and Development and from the three banks involved.

Analysis and discussion of findings

Analysis and discussion of findings for manufacturing SMMEs

Thus far, literature has been considered. In the section, manufacturing SMMEs' responses to questionnaire are analysed and discussed to deduce meaning and suggestions for improvement. Participants were asked questions concerning their ability to keep accounting records, use of business money for personal use, ease of borrowing, preparation of cash flow projections and increase of and retention of profits. The options for participants ranged from strongly disagree (1) to strongly agree (5). The results of the survey are shown in Figure 1.



Source: Research Findings, 2015

FIGURE 1: SMMEs financing history.

As shown in Figure 1, most of the participants ($n = 36$) disagreed that funds raised for business are adequate, while only three of them strongly agreed that the funds raised were adequate. The result of the study showed that most of the participants ($n = 32$) disagreed that securing a loan from either bank or CEDA was easy and nine of them agreed that securing a loan from either bank or CEDA was easy. The results demonstrate that SMMEs struggle with lack of capital. Furthermore, the findings show that 31 participants agree that manufacturing SMMEs are maintaining their accounting records up to date, while 18 of them disagreed that they were maintaining up-to-date accounting records. Majority of SMMEs show that they misuse business money by using it for personal expenses. This aggravates the already existing financing challenges. Majority of SMMEs plough back retained profits into the business. The participants' sentiments on use of retained profits to finance business support the internal finance theory (Kaplan & Warren 2010). Figure 2 considers the financing challenges that affect business.

Figure 2 shows some of the financing challenges that affect manufacturing SMMEs in Botswana. Lack of working capital tops the list of financing challenges (13%). This is directly linked to the other challenge cited as a major challenge – lack of growth in the business (13%). Furthermore, 'lack of funds for expansion' (7%) is mentioned as a big financing challenge among others. Other challenges include 'lack of customers', 'losing of tenders' and failure 'to meet targets'. However, a few of the participants mention that their reasons for not borrowing are 'need to grow slowly, one step-at-a-time without risking borrowing', 'we don't like borrowing' and 'the cost of borrowing is too high'. But overall, manufacturing SMMEs do not borrow because they cannot afford it. Furthermore, participants were requested to mention ways in which they solved their financing

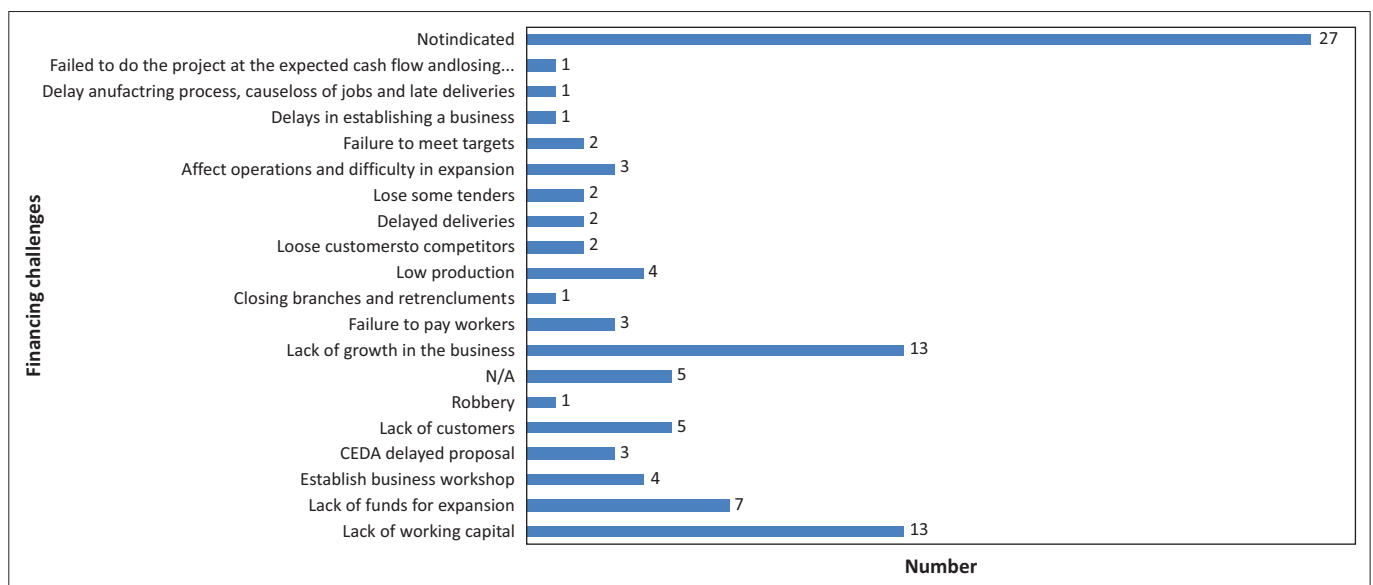
challenges. SMMEs try to solve their financing challenges as shown in Figure 3. Figure 3 shows that some SMMEs solve their financing challenges through external financing. Majority of the manufacturing SMMEs borrow money from friends/relatives, followed by those who use savings to finance business, that is, internal finance. These save part of the profits, which they later plough back into the business; then some SMMEs borrow money from financial institutions. Other measures include getting advice from experts, security reinforcement, diversifying, engage someone to follow-up payment. It can be concluded that manufacturing SMMEs tend to solve financing challenges the easier way, that is, borrowing from friends and family and falling back on their retained profits, while a few manage to get financing from financial institutions, particularly commercial banks. However, Kapunda (2015) argues that while external funding can be helpful, during tough financial times, businesses fail to pay back loans and they sink into more trouble. This usually leads to SMMEs remaining in financial turmoil, which threatens closure and/or failure.

Challenges faced by commercial banks when trying to finance manufacturing SMMEs in Botswana

The bank interview participants were Head of Public Sector from Bank 1 (aged 35–40 years), the Senior Branch Manager (aged 45–55 years) from Bank 2 and the Head of SME Banking from Bank 3 (aged 35–40 years). According to the participants, some of the challenges that commercial banks face when trying to finance SMMEs in Botswana include the following.

Lack of accounting records

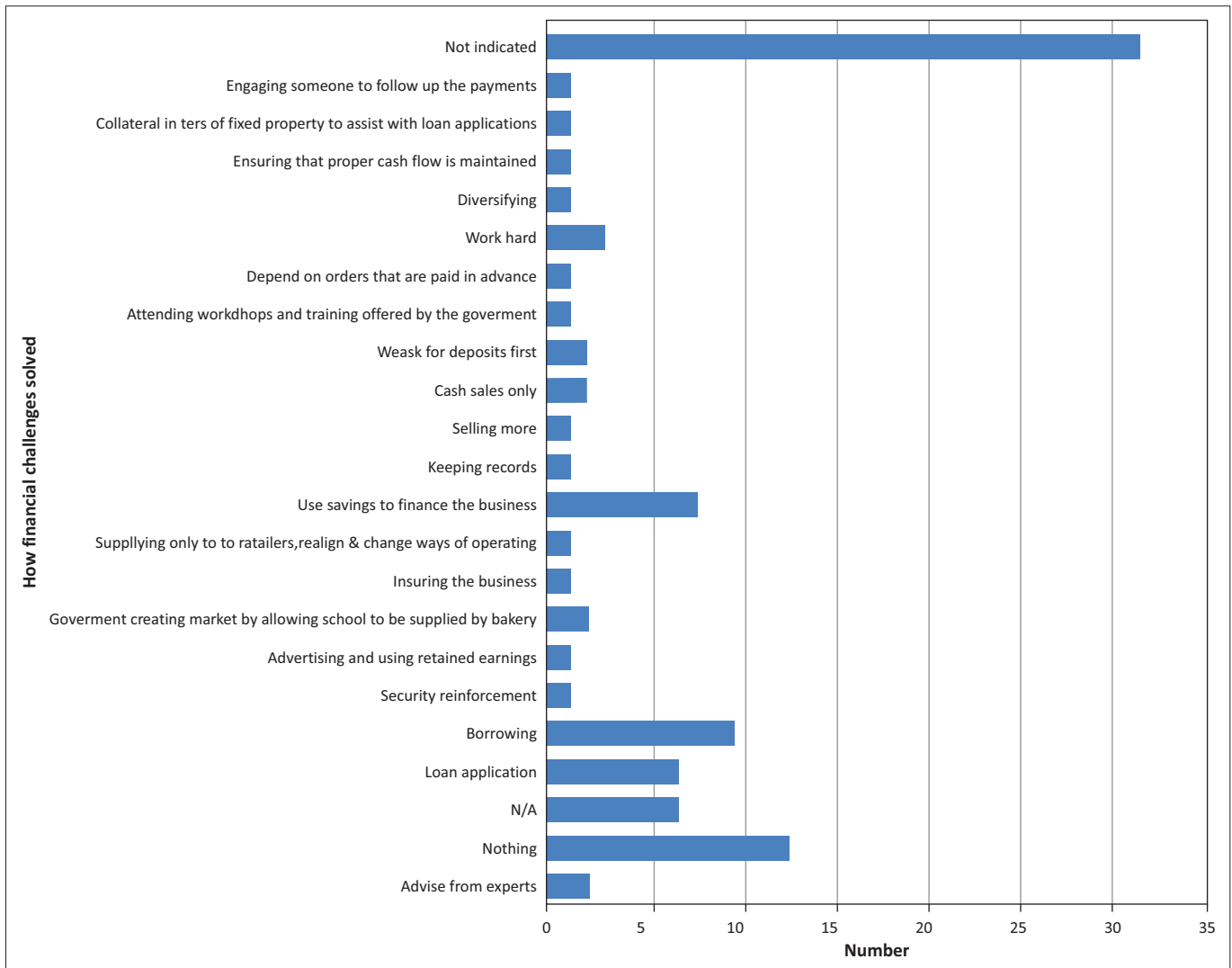
SMMEs do not keep record of their daily financial transactions. This interview response from banks tallies with



N=100

Source: Research Findings, 2015

FIGURE 2: Financing challenges that affect businesses.



N=100

Source: Research Findings, 2015

FIGURE 3: How the businesses solved their financing challenges.

the SMME questionnaire responses to the question ‘do you keep up-to-date records?’ In the questionnaire responses, about a third of manufacturing SMMEs stated that they did not keep records at all. The participant from Bank1 said:

We normally hold meetings with clients and tell them how to keep proper accounting records. But when they come for another meeting asking for financing, when you ask them for records, they either don’t have records or they have unacceptable records. For that reason, it becomes difficult to sponsor their projects.

Failure by manufacturing SMMEs to keep up-to-date accounting records agrees with the survey by Okurut *et al.* (2011), which revealed that in general SMEs in Botswana rarely keep records. As a result, manufacturing SMMEs find it hard to get bank financing as banks require up-to-date records to judge loan applicants’ potential for getting financing. Although Okurut *et al.* (2011) dwelt on general SMEs, the current study concentrating on manufacturing SMMEs affirms that SMMEs struggle to get financing, particularly for expansion.

Mixing personal finances with business finance

Respondents also mention that SMMEs do not separate their personal expenses from business expenses. Mannathoko (2011) asserts that SMEs tend to suffer financially because they misuse money. This point tallies with the current study’s rankings of challenges faced by manufacturing SMMEs from the questionnaire survey of SMMEs where SMMEs ranked misuse of money as a major financing challenge. One of the respondents (Bank3) puts it this way: ‘Many SMMEs just mix business and personal money, thereby misusing finances and hindering proper financial management. This in turn results in business failure or perpetual financial problems’. When SMMEs misuse business money, it affects records and causes the business to fail to attract financing from commercial banks.

Heavy debts

Findings reveal that one of the reasons why majority of manufacturing SMME loan applicants fail to get financing

is that SMMEs are overloaded with other debt before they approach the bank. This agrees with the findings made by Okurut *et al.* (2011) from a survey on general SME credit rationing. However, their survey differs from the current study in that the current study focuses on manufacturing SMMEs, while the earlier focuses on general SMEs that are not specific to any industry and it looks at small and medium enterprises, but excludes micro-enterprises. Bank 1 elaborates: 'Most of the SMMEs have been black listed by Information Trust Company (ITC) because they have been reported for having unpaid debts for the next 7 years so they are rejected for any form of financial assistance. However, at our bank we are more tolerant such that even when a person has been blacklisted at ITC, if they show some commitment to a good working relationship with the bank; we can finance their business, but cautiously'. This assertion reveals one of the main reasons why some manufacturing SMMEs do not even try to get financing from banks. Even if they try, SMMEs rarely admit that banks are not lending money to them due to the SMME's own indebtedness. This discovery helps the reader to understand that commercial banks do not just decide to refuse financing SMMEs. Rather, some SMMEs make things difficult for themselves by taking on too much credit, which hinders creditworthiness when financing is needed most.

Failure to save money for the future

Saving money is a general challenge for Botswana as a nation, and manufacturing SMMEs in particular. This notion is supported by IMF (2014) and African Economic Outlook (2014), which say that household debt in Botswana is one of the highest in the region and is a concern. Along these lines, Bank 1 explains:

We normally teach our clients to avoid borrowing for every little need and want. For example, if we finance a client's tender for BWP1 Million. Next time when the same client wins a tender for BWP20 000, we don't expect the client ask for financing as we assume they saved some money from the previous big tender.

This statement proves that banks want SMMEs to grow financially and avoid being too dependent. Therefore, SMMEs need to learn to save money for future use, both for personal and business (Mutoko 2012). By saving money, it helps SMMEs to increase chances of bank financing and to self-finance some minor projects.

Other worries by commercial banks towards SMMEs

Other worries of the commercial banks when lending to SMMEs include, 'risk factors' that is poor financing management, small '*market size, lack of collateral security, lack of honesty*' and SMMEs carrying *unrealistic dreams and unattainable proposals*. Bank 2 elaborates, 'Some manufacturing SMMEs carry dreams that are too big and unattainable. So as a bank we have to sit with them and clarify to them the need to scale down their dreams and proposals to become realistic. Otherwise we cannot finance unrealistic ideas and projects'. This further clarifies why some SMMEs fail to get external financing.

How banks deal with their worries

The ways in which commercial banks dealt with their worries when lending money to SMMEs include:

Blocking bank account temporarily: The banks block the client's account so that they cannot withdraw money from the account when the bank transfers the money into the account temporarily for records purpose. Some dishonest SMMEs had been rushing to withdraw the money before due time. As Bank 2 puts it, 'Some SMME loan applicants are dishonest. When they apply for GPO; we are not supposed to give them cash to finance their tenders. Rather we should pay direct to their suppliers to avoid funds misuse. After funding approval, we transfer the money into the applicant's bank account for record purpose before we transfer the money from his/her account to suppliers. But some dishonest SMMEs rush to withdraw the money from their account before we transfer to suppliers. They then quickly use the money for personal expenses. So we have learnt that as soon as the money enters applicant's account, as a bank we lock the money'. By locking the money therefore, the bank secures the money away from applicants who want to dishonestly misuse the business money. Dishonest SMMEs clearly demonstrate that they are not serious with business. Rather they are concerned with personal gain at the expense of business growth.

Obtaining financial history: Banks gather information concerning SMMEs' financial history, which includes past financing from elsewhere, records of cash flows over the years, SMME applicants' other sources of income and dependence. However, 'financial history is not easy to get because majority of manufacturing SMMEs do not keep up-to-date accounting records' (Bank 1).

Conclusions on challenges faced by banks in financing SMME manufacturing: Negative tendencies by manufacturing SMMEs result in a blame game where SMMEs blame the bank for not supporting them and banks are also protecting themselves from indebted clients and protect funds which rightly belong to the public. In any case, as Bank 3 mentions, 'banks are not in the business of losing money'. SMMEs therefore need to 'clean their hands before blaming bankers' (Bank 1). This means that SMMEs need to keep records, come out of debt, avoid using business money for personal reasons and learn to avoid borrowing for every little financial need.

Conclusion

The study concludes that manufacturing SMMEs have potential to help boost Gross Domestic Product, reduce poverty and unemployment and to diversify the economy. If all stakeholders put efforts together, this can be done, regardless of the current challenges besetting the industry. The findings have been very original, which will help increase the body of knowledge on challenges faced by manufacturing SMMEs. Implications of the study are that policy makers, manufacturing SMMEs, commercial banks and tertiary institutions are given homework to improve circumstances, thereby alleviating

financing challenges faced by manufacturing SMMEs and possibly all SMMEs in Botswana.

Recommendations

SMMEs should keep up-to-date records to meet commercial banks criteria for lending. SMMEs need to save money for business' future and avoid borrowing always. SMMEs should avoid unnecessary debt, which reduces their credit score. SMMEs should keep clean banking track record and operate business with integrity. SMMEs should separate personal transactions from business transactions to avoid misappropriation of funds. They should also seek help from LEA, bank officials or from competent consultants to ensure they have feasible business plans rather than carry unrealistic dreams. Furthermore, SMMEs need to benchmark with companies in other countries. Government and policy makers should come up with policies and incentives that make it easier for banks to lend money to SMMEs. Commercial banks should offer financing on a case-by-case basis considering among other things a firm's stage on the company life cycle, potential for success and not just refuse applications. They should consider financing SMMEs that have feasible ideas even when they have no collateral security and to mentor and guide SMMEs rather than just financing them. Symposia should be held where SMMEs are taught on how to relate with financial institutions and how to keep up-to-date records.

Limitations and scope for further research

It was not easy to get enough willing participants because some questions were deemed sensitive such as questions on profitability of a firm. The study was also limited due to the fact that majority (63%) of study participants were based in Gaborone. In future, studies should concentrate on the whole country and possibly extend to other countries in the region to be more comprehensive.

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Competing interests

The author declares that they have no financial or personal relationship(s) that may have inappropriately influenced them in writing this article.

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Determinants of inflation in Namibia: A co-integration approach

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The paper aims to examine the determinants of inflation in Namibia for the period 1993–2013. It was necessitated by the recent increase in consumer prices as world economies remain volatile. Moreover, theoretical and empirical predictions are not without ambiguities on the determinants of inflation in any given economy. The paper employed a co-integration technique to assess the determinants of inflation in Namibia. Empirical results suggest that inflation was mainly driven by imports and government spending for the period under review. Policy implications emanating from the study suggest that the country is vulnerable to external price changes from the markets whence its imports come from, especially those from South Africa. Also, the significance of government expenditure postulates that the Namibian government should reconsider its excessive spending (budget deficit) on the economy.

Introduction

As Namibia is striving to become an industrialised nation by the year 2030 (Vision 2030), it is vital to ensure that solutions that could lead to stabilisation in the general price level of goods and services are brought to light so as to achieve a high economic growth whilst maintaining a low inflation (Odada & Eita 2010). Moreover, Odada and Eita argued that the high rate of economic growth and macroeconomic stability can only be achieved in the presence of steady prices. Inflation, as defined by Pahlvani and Rahimi (2009), is 'a constant sustained rise in the general price level, as measured by the consumer price index' and may become a threat to economic growth because it diminishes the purchasing power of money for goods and services of the Namibian population. This fall in purchasing power may in the process prevent the poorest from affording their basic necessities. Therefore, combating high inflation rate becomes a primary objective incumbent upon the monetary authority in every country in order to maintain a healthier economy, and as such, the causes and determinants of inflation must be identified and monitored. Inflation can be easily curbed when the causes are clearly known (Pahlvani & Rahimi 2009). Two studies (Odada & Eita 2010; Ogbokor & Sunde 2011) emphasised the fact that Namibia is a member of a *unified market*: the Southern Africa Custom Union (SACU), other members being South Africa, Botswana, Lesotho and Swaziland. Apart from this fact, it is also a member of a Common Monetary Area (CMA) with its currency pegged to the South African rand on a one-on-one basis and imports more than 80% of its goods (mainly food) from SACU.

Additionally, Odada and Eita (2010) noted that Namibia had not experienced very high levels of inflation since 1980. Their studies also revealed that for the period 1980–1989, average inflation was 12.97%, with the highest level being 15.2% in 1982 and the lowest being 9.1% in 1984. From 1990–2007, average inflation was 8.8%, with the highest level being 17.7 in 1992 (drought year) and the lowest level being 2.3% in 2005. In the same streak, average inflation for the period 1980–2007 was 10.29%, with the highest level being 17.7% in 1992 and the lowest level being 2.3% in 2005. From 1980–2007, the inflation rate trend has been downward in Namibia, meaning that both studies concurred that policy makers and planners have reasonably been successful in dealing with the problem of inflation over the 1990s period. Economists hold conflicting theories with regards to inflation; nonetheless, there are two main types of inflation, namely, the demand–pull inflation and the cost–push inflation. Demand–pull inflation is the inflation emanating from the demand side, for instance, a constant increase in the growth of money supply, increase in government expenditure within the domestic economy, increase in foreign debts and so on. When this happens, there is a mismatch in the equivalent quantity of supply, and producers respond by increasing the general price levels of goods and services, which will consequently result in what we call inflation (Khai 2011).

The cost–push inflation, also known as supply–push inflation, happens because of increases in the cost of production of raw materials, that is an increase of price of input units, rising wages because of trade union activities, and so on (Khai 2011; Olatunji *et al.* 2010). Economic theories postulate

that *Economic Integration* between member countries such as SACU as well as the CMA helps to decrease the prices of goods and services because the imports of goods within these member countries is duty free. Nevertheless, in reality, this has not been the case in Namibia, because recently the general price levels have been increasing and hence the necessity of the study on the determinants of inflation.

Moreover, because the Bank of Namibia (BoN) framework acts as a *Currency Board* (a monetary authority that issues notes and coins fully convertible into a pegged currency at a fixed rate and on demand), the supply of money by BoN is not expected to create inflation in Namibia. It is for this reason that the study is critical as it attempts to prove if indeed these assumptions in monetary economics can hold true. There is a positive relationship between the growth of money supply (a rise in the act of issuing of notes and coins) and inflation (prices) as postulated by the classical economists. It is upon the basis of this belief that controlling the growth of money is vital for a healthier economy that will attract investors in the country. Thus, it is the responsibility of the BoN to ensure that the annual growth rate of money supply is not so excessive that it causes inflation and erodes the value of money.

Another gap that the study attempts to tackle is the inclusion of government spending on the consumption of goods and services plus how it impacts price levels in the domestic economy. The main reason for the inclusion of this variable is because the Namibian government has been pursuing an expansionary budget deficit for sometimes now, except in 2006, which rises government expenditure. It is expected that as government expenditure increases, price levels of agricultural goods especially begin to rise too. This causes Namibian produce to become less competitive in the global market as compared to the other international produces. As a result, domestic industries which rely on trade with other economies will be at risk of collapsing (Ogbokor & Sunde 2011). Inflation could pose an adverse and profound impact upon the quality of lives, especially the most poor because of prevailing increases in the general price level of goods and services. It therefore becomes the responsibility of the government to ensure that any variables that could be interplaying in the process of diminishing the purchasing power are closely monitored. Therefore, the study will attempt to shade some insights on the causes/determinants of inflation in Namibia, especially during the period of worldwide financial instability.

The objective of the study

The general objective of the research study is to examine the effect of some macroeconomic variables, namely, money supply, imports and government expenditure on the level of inflation in Namibia. In quest of the study, the paper tries to achieve three main specific objectives as stated below:

1. To investigate the relationship between money supply and inflation
2. To examine the relationship between government spending and inflation
3. To evaluate the relationship between imports and inflation.

Literature review

Theoretical literature

Theoretical literature on the determinants of inflation is filled with contradictory views with regards to the causes of inflation. Below are the theoretical explanations as postulated by various economists:

The demand–pull inflation: Demand–pull inflation exists when the aggregate demand of goods and services from the consumers' side exceeds the aggregate supply (output) when the economy is at or close to full employment. The excess demand can be a resultant of either the rise in real GDP or the monetary sector of the economy, which is described as 'too much money chasing too few goods'. The main sources of demand–pull inflation are increases in government spending, increase in money supply and rise in household and firms consumption (Ogbokor & Sunde 2011).

The cost–push inflation: Cost–push inflation exists when wages or production costs start rising. The producers in turn pass these rising costs upon the consumers, leading to higher prices. Ogbokor and Sunde (2011) noted that this kind of inflation occurred mainly because of a rise in the cost of imported raw materials and an increase in the cost of labour.

The Monetarists' view: Monetarists' economists argue that there is a direct relationship between price and money supply. They believe that 'inflation is always and everywhere a monetary phenomenon'; hence, prices are likely to increase when the rate of inflation in money supply is greater than the rate of increase in real output of goods and services (Johnson 1973 cited in Olatunji *et al.* 2010). In addition, Goamab (1998) noted that such a situation (where any extra cash balances is spent on the acquisition of assets) will give rise to excess demand for assets, which will ultimately lead to increases in the general price level, thereby leading to a rise in inflation.

The Keynesians's views: The Keynesians tend to attribute inflation more to demand pressures within the economy. It is not necessarily a monetary phenomenon as opposed by the Monetarists' economy (Goamab 1998; Ogbokor & Sunde 2011). Furthermore, they believe that inflation is caused by movements in the rate of interest, which is in contrast to the Monetaristic view, which claims that inflation is caused by money supply.

The Structuralists' view: Structuralist economists stressed the significance of demand pressures, cost pressures and business cycles within an economy as the core causes of inflation. Structural inflation, as asserted by Conavese (1982) cited in Odada and Eita (2010), originates from three inter-related phenomena, namely, changes in economic structures which causes changes in relative prices, some money prices (especially wages) are inflationary (or rigid) downwards and an induced growth in money supply occurs to accommodate the resulting increases in the general price level.

Empirical literature

The section analyses the empirical works that have been conducted in the area of inflation in Namibia as well as other studies in various countries. The aim is to establish evidence of the existence of this phenomenon in these countries and to verify whether the theories analysed in the theoretical literature do hold true.

Empirical studies on Namibia's inflation: Goamab (1998) conducted a study on inflation in Namibia using data covering the period 1974–1996. The study applied a combination of econometric techniques, namely, co-integration (CI), error correction modelling (ECM) and structural stability testing. The CI method was used to capture potential information about the long-term equilibrium relationship of the model, whereas the ECM was used to evaluate the short-term adjustments in the model and structural stability testing was used to analyse the behaviour of inflation function in Namibia. The study shows that Namibia's inflation is highly affected both in the short-run as well as in the long-run by external factors. A study was conducted by Odada and Eita (2010) to establish the possible causes of inflation in Namibia. They used annual time series data covering the period 1972–2008. The Augmented Dickey–Fuller (ADF) unit root and CI tests were carried out. The results revealed that money supply and imports have a positive impact on inflation. Also, Ogbokor and Sunde (2011) utilised ordinary least squares (OLS) estimation techniques to analyse and test the hypothesis as to whether inflation is mainly driven by imports using annual macroeconomic data from 1980–2007. They found out that amongst other variables, imports and money supply played a significant role in explaining inflation in Namibia.

Empirical studies on other countries' inflation: Olatunji *et al.* (2010) did a study for AAAE and AEASA in Nigeria. Time series data were employed using descriptive statistics and CI analysis tools. They concluded that total imports, government expenditure and money supply exert a positive effect on inflation, especially on food prices. In the same view, Arif and Ali (2012) utilised Johansen–Juselius CI method and the ECM to test for both long-run property of the model and short-run determination in Bangladesh. The study employed data from 1978–2010. They concluded that there was a positive relationship between money supply, government expenditure and imports on inflation in the long-run. On the other hand, there are other studies that have been carried out that found an inverse relationship between the independent variables (imports, government expenditure and money supply) and inflation. Ali and Mim (2011) did a study on the drivers of inflation in eight MENA countries by using annual data from 1980–2009. The study applied estimation techniques, namely, system of Generalised Method of Moments. They concluded that there was a negative relationship between money supply growths and government spending against inflation.

In the study by Sola and Peter (2013), the Nigeria Autoregressive model was used covering secondary data ranging from 1970–2008. The results revealed money supply to be positively related to inflation, but government

expenditure had an inverse relationship. Also, Adusei (2013) carried out a study on South Africa using time series data starting from 1965–2006 to investigate whether inflation in South Africa is a structural or a monetary phenomenon. Unit root testing, CI analysis, fully modified ordinary least squares, two-stage least squares regression, ECM and pairwise Granger Causality test techniques were conducted. The study disclosed that, amongst other, there was an inverse relationship amongst broad money supply, openness of the South African economy and government expenditure with inflation. Based on the aforementioned literatures, one can firmly say the following: there are mixed findings with regards to the causes of inflation ranging from those refuting and agreeing (or no relationship at all). There are also significant methodological approaches, be it a cross-country study or an individual country study. There is variation in terms of data frequency utilised ranging from monthly, quarterly and annually. There seems to be no study in Namibia that has attempted to study the cause of inflation using government expenditure as a determinant of inflation. It is against this background that the study intends to fill up the gap and add up to the empirical literature for Namibia.

Methodology

The study will adopt a CI functional approach as used by Olatunji *et al.* (2010). This is in line with the main objective of the study, which is to discover the links between inflation and its possible determinants in Namibia by employing a CI approach. The study considers Namibia's Money Supply (M2 = currency, demand deposit, overnight and quasi money), Imports (spending by firms, individuals and government for goods and services produced in foreign nations) and Government Expenditure (spending by the Namibian government for goods and services it consumes in providing public services) as the major determinants of inflation in Namibia. The specific model is expressed as:

$$\ln Y_t = \vartheta_0 + \vartheta_1 \ln X_{1t} + \vartheta_2 \ln X_{2t} + \vartheta_3 \ln X_{3t} + \vartheta_4 \ln X_{4t} + \xi \quad (1)$$

Where Y_t = annual inflation rate, X_1 = annual money supply, X_2 = annual imports, X_3 = annual government expenditure, X_4 = annual gross domestic product and ξ is the stochastic error term with the usual properties. The subscript t denotes the time period and the rest are parameters. In light of the objectives of the study, as well as in line with the conceptual framework of the topic and the methodological issues, the estimation technique is carried out in steps. The first step before conducting a CI test will be to carry out a unit root test in order to check whether the variables are stationary, so that spurious regression results are avoided.

Stationarity or non-stationarity: To test whether variables are stationary or non-stationary, the study carries out the ADF statistic. However, ADF statistic has limitations in the sense that it has lower power, such that it is likely to under-reject the null hypothesis of unit roots. Because of this constraint, an additional test statistic, the Phillips–Perron (PP) statistic, will be used in the study. This is one gap filled by the study

because there has been no study in Namibia that has used the PP approach to test for unit root. According to Arif and Ali (2012), a stationary time series is one whose basic properties do not change overtime, whilst a non-stationary variable has some sort of upward or downward trends.

CI test: An Engle–Granger (E-G) CI method will be applied because the study intends to merely use a single equation, after establishing non-stationarity, in order to determine long-term equilibrium relationships amongst the variables. The study will utilise annual time series data covering the period 1993–2013. The reason for choosing this time interval is that there was no suitable data available prior to independence gained in 1990, and this lack of data for a considerably sufficient period poses a serious estimation challenge. The data in the study were obtained from the Namibian Statistical Agency and the World Bank.

Empirical results and analysis

Unit root test

The ADF test is used to test whether variables exhibit unit root, and it is further confirmed by verifying with the PP test. The reason why such verification is deemed necessary is because ADF test has the tendency of having lower power, such that it is likely to under-reject the null hypothesis of unit roots. Table 1 presents the results of unit root test.

Table 1 presents the outcome of the unit root test from the ADF test and the PP test. At all levels, all the variables in both the tests exhibited unit root, that is they are non-stationary. However, after differencing the variables, they all became stationary at 5% for both tests, which indicates that all variables are integrated of degree one, I(1). Differencing is deemed necessary in order to avoid having spurious regression. Seeing that the variables became stationary after the first difference, it was imperative that a CI test be conducted in order to determine whether there was long-run relationship between the series.

Testing for CI

Two or more variables are said to be co-integrated if they have a long-run, or equilibrium, relationship between them. In economics, this implies that the co-integrated variables

TABLE 1: Unit root stationarity test: ADF and PP in levels and first difference.

Variables	Model specification	ADF		PP		Order of integration
		Level	First difference	Level	First difference	
LY	Intercept and	-3.2757	-3.8718**	-2.6956	-3.8624**	I(1)
	trend	-2.8704	-3.9786**	-2.3694	-3.9907**	
LX ₁	Intercept and	-1.8150	-3.7090**	-1.8150	-3.6194**	I(1)
	trend	-1.1444	-3.8452**	-1.1444	-3.8125**	
LX ₂	Intercept and	-2.6995	-4.1322**	-1.8868	-3.1952**	I(1)
	trend	0.0505	-3.9881**	-0.0036	-3.2664**	
LX ₃	Intercept and	-1.1366	-4.1712**	-1.1366	-4.1644**	I(1)
	trend	1.1622	-3.8467**	1.3282	-3.8467**	
LX ₄	Intercept and	-2.2952	-4.8089**	-2.2870	-4.8089**	I(1)
	trend	0.9190	-4.7072**	0.9190	-4.7081**	

Source: Author's compilation and the values were obtained from Eviews.
**, The rejection of the null hypothesis is at 5%.

will move closely together over time. In the study, the E-G CI test was used mainly because the study used a single equation. This was simply conducted by first obtaining the residuals from the OLS regression, and the ADF test was used to determine CI. The E-G CI test results are presented in Table 2.

From Table 2, we can observe that the residual term (ECT) is stationary at all levels, that is I(0). This suggests our variables are co-integrated. In fact, the residual also appeared to be stationary when plotted (see Appendices A1 and A2). This re-affirms that the variables in the model are indeed co-integrated. With these outcomes, it implies that ECM can be estimated. The model in Eqn (1) is re-specified as:

$$\Delta \ln Y_t = \vartheta_0 + \vartheta_1 \Delta \ln X_{1t} + \vartheta_2 \Delta \ln X_{2t} + \vartheta_3 \Delta \ln X_{3t} + \vartheta_4 \Delta \ln X_{4t} + \varphi \text{ECT}_{t-1} + \xi \quad (2)$$

Where all variables are as defined before and ECT_{t-1} is the lagged error correction term, which is given by the residual from Eqn (1).

Estimating the ECM

The ECM integrates short-run dynamics with the long-run equilibrium without losing any long-run information. The ECM is helpful in the derivation of the short-run impacts on the inflation rate in Namibia. Table 3 presents the ECM results.

Table 3 reports that both government spending and imports have a positive and significant impact on inflation in Namibia, whilst money supply and gross domestic product have an inverse relationship, but it was however insignificant. The finding strongly proves that government expenditure, followed by imports is the reason for inflation in the Namibian economy. Hence, it is safe to say that Namibia's inflation rates are import driven. This is because of the spillover

TABLE 2: Engle-Granger CI result.

ADF –Test	Significance level	t-statistics	P-value
Null Hypothesis: ECT has a unit root	-	-	-
ADF test statistic	-	-4.5176	0.0103
Test critical values:	1% level	-4.5325	-
-	5% level	-3.6736**	-
-	10% level	-3.2773	-

Source: Author's compilation and the values were obtained from Eviews.

**, The rejection of the null hypothesis is at 5%.

TABLE 3: Results from the ECM.

Variable	Coefficient	Standard error	t-Statistic	Probability
DLNX ₄	-1.900757	3.089811	-0.615169	0.5491
DLNX ₃	5.178453	1.877023	2.758865	0.0163
DLNX ₂	2.330495	0.812770	2.867348	0.0132
DLNX ₁	-0.998563	0.590220	-1.691850	0.1145
ECT	-8.754834	2.176754	-4.021967	0.0015
C	-0.250351	0.152133	-1.645609	0.1238
R-squared	0.733485	Mean dependent variable	-0.012676	
F-statistic	7.155531	Durbin-Watson statistic	1.941842	
Probability (F-statistic)	0.002024		-	

effect of the rise in the prices from industrial countries with which Namibia has trade relations. The strong significance of government expenditure could be because of the excessive involvement of the government (through its expansionary fiscal policy) in combating unemployment and building the country's infrastructure, which meet the objectives of vision 2030 so as to attract potential investors and in the end achieve industrialisation. We can further observe that the error term is negative and statistically significant. This suggests that the adjustment process to equilibrium is about 875%. Moreover, the model's DW-statistics of 1.9, which is approximately closer to 2, shows that there is no first-order autocorrelation in the error term.

Conclusion and policy implications

The study looks at the possible determinants of inflation in Namibia. This is because of the fact that maintaining a low and a stable inflation rate is vital for the sound economic growth of Namibia and for any country desiring to attain macroeconomic stability. The empirical results show that inflation in Namibia is mainly an argument for imports and government expenditure in the short-run. The significance of imports in our analysis suggests that Namibia is heavily an open and import-dependent economy. As a result, the country is vulnerable to external price changes from the markets whence its imports come from, especially those from South Africa. Also, the significance of government expenditure postulates that the Namibian government should reconsider its excessive spending (budget deficit) on the economy. Conversely, the study reveals that GDP and broad money supply exerted a negative impact on inflation, which is contrary to the outcome obtained by Odada and Eita (2010).

The policy recommendations that are necessary in order to lessen the momentum of inflation in Namibia are the following:

- Imports must be minimised in Namibia. This can be achieved by encouraging the domestic manufacturing base of primary products to start adding value to the natural resources they extract. Also, policies (such as lower taxes, tax holiday and land tenure) which would attract investment in the agricultural sector ought to be encouraged in order to enhance the agricultural output and in the process achieve food security as well as to reduce the effects caused by the drastic change in the prices of these imports.
- It is worth mentioning that the role of government spending is very important for economic growth; however, because of the significance of government expenditure on inflation, the Namibian government should minimise its involvement in the economy. That is, it should stop doing what the private sector can do. This can be achieved by pursuing a contractionary fiscal (or monetary) policy so as to minimise the dangers of deficit spending.
- The government of Namibia should consider the immediate implementation of import substitution. These inward-looking policies such as higher tariffs, low quotas and infant industry protection should be highly considered if we are to achieve industrialisation by the year 2030.
- On the basis of the study, we can conclude that inflation in Namibia is triggered by both the demand side factor alongside with the supply side factor, but government expenditure together with imports were found to be critical. It is imperative that future studies should be carried out using a different data set and a different methodological approach in order to determine whether similar findings can be obtained.

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Competing interests

The authors declare that they have no financial or personal relationship(s) that may have inappropriately influenced them in writing this article.

Authors' contributions

V.J.U. (University of Namibia) and T.K. (University of Namibia) contributed equally to the writing of this paper.

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APPENDICES

Appendix 1

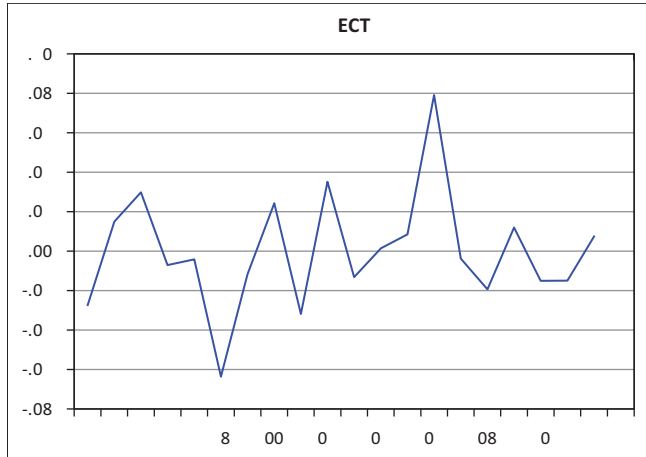


FIGURE 1-A1: Plot of residual, ECT.

Appendix 2

TABLE 1-A2: Table of residual, ECT.

ADF test	Level	1st difference	t-statistic	P-value
Null hypothesis: ECT has a unit root	-	-	-	-
Exogenous: Constant, linear trend	-	-	-	-
Lag length: 0 (Automatic –based on SIC, maxlag = 4)	-	-	-	-
ADF test statistic	-	-	-4.517634	0.0103
Test critical values:	1% level	-	-4.532598	-
	5% level	-	-3.673616	-
	10% level	-	-3.277364	-
ADF test equation	-	-	-	-
Dependent variable: D(ECT)	-	-	-	-
Method: Least squares	-	-	-	-
Included observations: 19 after adjustments	-	-	-	-
Variable	Coefficient	Standard error	t-Statistic	Probability
ECT(-1)	-1.102251	0.243988	-4.517634	0.0004
C	-0.000486	0.014964	-0.032489	0.9745
@TREND(1993)	0.000189	0.001313	0.143804	0.8875
R-squared	0.561415	Mean dependent variable	-	0.001832
Adjusted R-squared	0.506591	Standard deviation dependent variable	-	0.044441
Standard error of regression	0.031217	Akaike information criterion	-	-3.951767
Sum squared residual	0.015592	Schwarz criterion	-	-3.802645
Log likelihood	40.54178	Hannan–Quinn criterion	-	-3.926529
F-statistic	10.24046	Durbin–Watson statistics	-	1.97610ç1
Probability (F-statistic)	0.001369	-	-	-

Appendix 3

TABLE 1-A3: Data used in the study period 1993–2013 (X_t and Y_t were obtained from NSI and the rest of the variables were from the World Bank).

Year	Y_t	X_2	X_3	X_4	X_5
1993	8.55	1.71E + 09	1.13E + 09	32.03505	41 476
1994	10.74	1.78E + 09	1.15E + 09	34.16115	42 194
1995	10.06	1.94E + 09	1.18E + 09	37.81658	43 839
1996	8.00	2.25E + 09	1.21E + 09	39.55621	45 238
1997	8.85	2.32E + 09	1.26E + 09	38.36206	47 147
1998	6.20	2.5E + 09	1.3E + 09	37.90007	48 699
1999	8.59	2.53E + 09	1.35E + 09	41.06174	50 340
2000	9.38	2.4E + 09	1.37E + 09	39.98176	52 098
2001	9.18	2.75E + 09	1.41E + 09	37.70814	52 712
2002	10.96	2.91E + 09	1.37E + 09	35.09389	55 236
2003	7.33	3.22E + 09	1.42E + 09	36.52884	57 578
2004	4.14	2.9E + 09	1.49E + 09	37.07182	64 642
2005	2.28	2.93E + 09	1.4E + 09	37.61627	66 277
2006	4.95	3.4E + 09	1.55E + 09	41.67903	70 965
2007	6.55	4.49E + 09	1.75E + 09	39.85046	74 779
2008	9.06	5.28E + 09	1.9E + 09	41.6751	77 655
2009	9.49	6.26E + 09	1.99E + 09	64.56716	76 522
2010	4.92	5.56E + 09	2.02E + 09	63.21905	81 569
2011	5.00	5.42E + 09	2.17E + 09	63.82857	86 473
2012	6.72	6.26E + 09	2.22E + 09	55.75014	92 258
2013	5.61	7.23E + 09	2.42E + 09	-	96 323

Does corporate social responsibility affect companies' financial performance? A review of empirical studies

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The increasing changes in environmental, social and economic trends have encouraged companies to be more involved in socially responsible initiatives. Corporate social responsibility (CSR) is the involvement of a company in addressing environmental and social challenges faced by the society. Whilst the main objective of a company is wealth creation and profit maximisation, concerns for contribution to societal development have mooted useful and mutual beneficial business practices with potential financial involvement. The study reviewed and examined CSR theories to locate the impact of these theories on a company's financial performance. The review and examination of the studies conducted from the 1970s to 2013 found a mixed pattern of the relationship between financial performance and CSR. This mixed pattern provides evidence that the relationship between companies' financial performance and social performance could be positive, negative or non-significant. This mixed pattern is part of the big ongoing debate on this topic, and such a debate is possibly inevitable, given that empirical studies test different hypotheses, use different methodologies and consider different sectors or industries at different time periods.

Introduction

Increasing changes in environmental, social and economic trends have encouraged companies to be more involved in socially responsible initiatives, known as corporate social responsibility (CSR). CSR is broadly defined as 'a company's positive impact on society and the environment through its operations, products and services and through its interactions with key stakeholders such as employees, customers, investors, communities and suppliers' (Katsoulakos & Katsoulakos 2006:13). Several terms such as corporate citizenship, corporate accountability, business ethics, corporate social investment (CSI) and corporate responsibility have been used interchangeably with CSR (Amaladoss & Manohar 2013). CSR is therefore associated with different definitions, but such definitions commonly refer the role of companies in integrating social, economic and environmental dimensions to fulfil the needs of all its stakeholders (Barthorpe 2010). Thus, CSR explains how companies direct their activities towards creating value for people (creation of well-being inside and outside the organisation), planet (achievement of ecological quality) and profit (maximisation of profit), whilst communicating with all stakeholders on the basis of transparency (Carroll 1999). With the help of CSR, companies are able to address various challenges faced by the society in which they operate.

The involvement in CSR means that companies have to channel some resources towards developing strategies that seek to improve their involvement in CSR. Thus, CSR encourages companies to add the social welfare role to their major objective of value maximisation. This role has raised a number of questions, including why should companies be involved in CSR and whether CSR has any effect on companies' financial performance (Renneboog, Horst & Zhang 2008). To address these questions, a number of theories that seek to explain the motive behind CSR and its contribution to a companies' performance have been developed. Some theories (Freeman 1999; Freeman & McVea 2001) suggested that a company should benefit from improved CSR, whilst others (Friedman 1970) considered the involvement in CSR as a deviation from a company's core objective of making profit. Thus, this paper aims at reviewing empirical studies on the relationship between companies' social performance and financial performance to establish whether the findings support the notion that companies benefit financially from their involvement in CSR.

Theoretical approaches of CSR

There are a number of theories that explain the motive behind companies' involvement in CSR, but they are classified into two major categories, namely value maximisation and stakeholder approaches. These two approaches mostly differ when it comes to the process of maximising a

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company's value and the motive behind socially responsible activities, but they agree that the long-run value of a company should be maximised.

Shareholders value maximisation approach

Shareholders value-maximisation approach involves a group of theories with a common view that all companies' decisions should seek to increase the total long-run market value of the firm (Jensen 2002), which implies that the decision of a company's involvement in CSR should be aligned with value maximisation. Thus, the sole purpose of CSR should be creating wealth for its shareholders through value maximisation (Garriga & Melé 2004). In this approach, the value to be maximised is the market value, which may be different from profit maximisation (Jensen 2002). However, in the context of CSR, the terms value maximisation and profit maximisation or wealth maximisation are often used interchangeably. In the context of the study, the value-maximisation approach refers to any theory that links CSR to a single objective of maximising company value or profit.

Most of the theories under the value-maximisation approach have their origin in neoclassical economics; hence, these theories are described as utilitarian or traditional. The term utilitarian mainly refers to the traditional economic approach of studying a company's behaviour solely based on its profit-maximising function (Secchi 2007), which means that companies should primarily be concerned with shareholders' utility maximisation (Melé 2006). Milton Friedman (1970) is one of the economists who represented this stream of thought in his article published in *New York Times Magazine* that the sole social responsibility of a company is to increase its profits. Friedman argued that a company's involvement in social responsibility should be motivated by a single objective of profit maximisation; otherwise, the involvement in CSR would only create additional costs to the company. Friedman also argued that a company's shareholders should be involved in the socially responsible activities as individuals instead of being involved through the company.

These traditional theories recognise that a company is socially created and approved, but insist that a company's primary objective is to provide goods and services to the society at the right price with good quality (Knox & Maklan 2004). As a result, companies achieve the role of social responsibility by focusing on achieving economic objectives through social activities that generate profit (Garriga & Melé 2004). Proponents of this group of theories maintain that if shareholders' wealth is maximised, social welfare is also maximised, and as a result a company's social responsibilities should only be challenged based on the ability of maximising its shareholders' wealth (Margolis & Walsh 2003). According to this stream of thoughts, a company's social responsibility depends on its financial performance, which implies that social performance and financial performance are positively related across a wide range of industries (Orlitzky, Schmidt &

Rynes 2003). Hence, companies should focus on a single goal of maximising shareholders' value, and social performance will be achieved through this value-maximisation goal. Generally, this group of theories indicates that social welfare is maximised when all companies in an economy maximise their total wealth or value.

Stakeholder approach

The second group of theories that explain the motive behind companies' involvement in socially responsible activities is described as stakeholder approach. This approach seeks to explain the interaction between a company and its immediate society. Contrary to the value-maximisation approach, the stakeholder approach argues that companies should take into consideration all their constituencies known as stakeholders (Jensen 2002). The stakeholder approach goes beyond the neoclassical view of treating a company as a closed system and views a company as an open system that should manage its relations with society (Steurer *et al.* 2005). The stakeholder approach became a central point in the mid-1980s, especially after R. Edward Freeman's stakeholder approach to strategic management in 1984 (Freeman & McVea 2001). Freeman suggested that companies have to pay attention to their relationship with all stakeholders (individuals or groups who can directly/indirectly affect or be affected by a company's activities) to be effective in the society. The proponents of this approach argue that, in a competitive environment, a company may not survive without support from all its stakeholders (Freeman 2010), meaning that companies should interact well with all their stakeholders to secure important resources provided by such stakeholders (Steurer *et al.* 2005). Maintaining a good relationship with all stakeholders can be a source of competitive advantage because such stakeholders have resources and power to influence a company's survival, competitiveness and profitability (Good 2002). Thus, a company does not exist only to earn profit but also to satisfy the interest of all its stakeholders (Ihugba 2012). Whilst this view is contrary to the view of the value-maximisation approach that a company maximises its profits to a single stakeholder group, the shareholders, the stakeholder approach proposes inclusive strategies of integrating the interests of all stakeholders, rather than maximising the interests of one group of stakeholders.

Although the stakeholder approach advocates for equal treatment of all stakeholders, it emphasises that stakeholders have different levels of influence on a company's activities. Hence, this approach encourages companies to develop strategies inclusive of all categories of a company's stakeholders. However, this may not be a simple task, as there may be a conflict of interest amongst stakeholders' categories. In other words, each group of stakeholders has its own interest, and it may be difficult to defend all stakeholders' interests. Because of the potential conflicts amongst stakeholders, the stakeholder approach encourages companies to evaluate the demands of the different stakeholders' groups and to make them match with the company's objectives (Good 2002). Thus, a company has to take into consideration the economic,

environmental and social concerns of all stakeholders, to develop inclusive objectives supported by every member of the society (Freeman & McVea 2001), and this approach suggests that all stakeholders, who voluntarily come together and cooperate to improve everyone's condition, can still create an economic value for the company.

Empirical findings on the relationship between CSR and corporate financial performance

This paper has reviewed the empirical studies conducted from the 1970s to 2013 on the relationship between companies' social performance and corporate financial performance (CFP). A summary of these studies with their empirical findings, given in Table 1, shows that empirical studies on this topic have produced different findings, suggesting that there is no consensus on the relationship between CSR and a company's financial performances. Some studies concluded that CSR has a positive effect on a company's economic performance, whilst others found that CSR negatively affected companies' financial performance. In contrast, a number of studies produced inconclusive results or found that CSR has no effect on a company's financial performance.

Methodological differences in measuring CFP

Table 1 shows that the reviewed empirical studies on the relationships between CSR and CFP from the 1970s to 2013 mostly used accounting- or market-based measures

of CFP, with the exception of a few studies that used survey questionnaires. These two common measures of CFP, accounting- and market-based measures, tend to have a significant impact on the findings (Peloza 2009). For example, a company's social performance tends to correlate more with accounting-based measures (such as return on equity) than with market-based measures (such as share returns) of financial performance (Orlitzky *et al.* 2003). These two measures have their weaknesses and strengths. On the one hand, accounting measures capture only the historical aspects of a firm's performance and tend to be subject to bias from managerial manipulation and differences in accounting procedures (Tsoutsoura 2004). On the other hand, market-based measures of CFP can be affected by other factors such as speculation (López, Garcia & Rodriguez 2007). However, market-based measures represent the investor's evaluation of a company's ability to generate future economic return (McGuire, Sundgren & Schneeweis 1988), and hence it appears to be less vulnerable than accounting procedures (Tsoutsoura 2004).

Another way of categorising the methodology used by empirical studies on the relationship between CSR and CFP is to focus on the short- and long-run measures of CFP. This reveals that two types of methodology were used by the reviewed studies. The first one is the event study methodology, which mostly examines the short-term effect of CSR on CFP based on market measures of financial performance. This review of empirical studies shows that studies that used event study methodology produced different results. Some studies found a positive or a negative relationship, whilst

TABLE 1: Empirical studies on the relationship between CSR and CFP since 1970s to 2013.

Author(s) and year	Topic investigated	Measure of CFP
Studies with a significant positive relationship		
McGuire <i>et al.</i> (1988)	CSR and company's risk and financial performance	Accounting- and market-based
Ruf <i>et al.</i> (2001)	The relationship between CSR and CFP	Accounting-based
Tsoutsoura (2004)	CSR and CFP in European companies	Accounting-based
Luo and Bhattacharya (2006)	CSR, customer satisfaction and market value	Market-based
Wahba (2008)	Corporate market value and environmental responsibility	Market-based
Shen and Chang (2009)	Effect of CSR on firms' financial performance	Accounting-based
Lin <i>et al.</i> (2009)	Effect of CSR on financial performance in Taiwan	Market-based
Tsai <i>et al.</i> (2010)	SRI programmes and costs evaluation	Survey questionnaire
Loureiro <i>et al.</i> (2012)	CFP and labour practices, community development and environmental performance	Accounting-based
Hossain <i>et al.</i> (2013)	Contribution of CSR to mass access in global market by the SMEs	Survey questionnaire
Studies with a significant negative relationship		
Lerner and Fryxell (1988)	Multidimensional analysis of predictors of CSR	Accounting- and market-based
Wright and Ferris (1997)	Effect of divestment on corporate value	Market-based
López <i>et al.</i> (2007)	Sustainable development and CFP	Accounting-based
Abiodun (2012)	CSP and firms' profitability in Nigeria	Accounting-based
Studies with mixed results (a significant positive and negative relationship)		
Barnett and Salomon (2006)	Curvilinear relationship between CSR and CFP	Market-based
Wang, Choi and Li (2008)	Corporate philanthropy and firm financial performance	Accounting- and market-based
Kang <i>et al.</i> (2010)	Effect of CSR activities on CFP	Accounting- and market-based
Inoue and Lee (2011)	Dimensions of CSR and CFP in tourism-related industries	Accounting- and market- based
Studies with a non-significant relationship or inconclusive results		
Alexander and Buchholz (1978)	CSR and stock market performance	Risk-adjusted market measures
Aupperle <i>et al.</i> (1985)	CSP and profitability	Accounting- and market-based
McWilliams and Siegel (2000)	CSR and CFP: Correlation or misspecification	Accounting-based

others reported a non-significant relationship. The second type of methodology used was a regression and correlation analysis, which mostly estimated the relationship between CSR and CFP based on accounting measures of CFP, such as return on equity and return on asset. Similarly, these studies also produced mixed results. Although these studies tend to suggest that both methodologies produced similar (mixed) results, there is still a big academic debate on the type of methodology to be used in assessing the effect of CSR on CFP.

Empirical evidence supporting a positive relationship between CSR and CFP

Theoretical explanations behind a positive relationship between CFP and CSR are based on the view that socially responsible companies have an economic advantage. Proponents of this view reason that socially responsible activities increase CFP by improving companies' brand image and reputation, employee morale and productivity, and customer satisfaction (McGuire *et al.* 1988), which implies that there are both theoretical and empirical explanations behind the positive relationship between CSR and CFP. A study by Ullmann (1985) reviewed 13 studies that conducted empirical investigations on the relationship between financial performance and social performance of US companies. Out of these 13 studies, 9 reported a significant relationship between the variables, and within these 9 studies, only 1 study found a negative relationship, whilst the remaining 8 reported a positive relationship between financial performance and social performance. Overall, Ullmann's (1985) findings suggested that there appeared to be a positive relationship between social and financial performances, which implies that socially responsible companies tend to outperform less socially responsible companies (Ullmann 1985). The results are supported by other studies (Hossain *et al.* 2013; Lin, Yang & Liou 2009; Loureiro, Sardinha & Reijnders 2012; Luo & Bhattacharya 2006; McGuire *et al.* 1988; Ruf *et al.* 2001; Tsai *et al.* 2010; Tsoutsoura 2004; Wahba 2008), which found a positive relationship between CSP and CFP.

Ruf *et al.* (2001) investigated the relationship between CSR and accounting measures (return on sales and return on equity) on a company's financial performance, which showed that improvements in CSR have both short- and long-term effects on CFP. This was confirmed by Tsoutsoura (2004) who tested the relationship between companies' social responsibility and financial performance in 500 US companies over a period of 5 years (1996–2000). Furthermore, Lin *et al.* (2009) conducted a similar investigation, but their focus was on 1000 Taiwanese companies during the period 2002–2004, and their findings confirmed a positive relationship between CFP and CSR. However, they found that the relationship tended to be strong in the short-term, with mixed results for long-term analysis.

A study by Loureiro *et al.* (2012) focused on investigating the contribution to consumer satisfaction of the perceived socially responsible activities in terms of labour practices, community development and environmental performance

in the Portuguese automobile industry. The study concluded that companies' socially responsible activities contribute to better financial performance by directly reducing costs and increasing productivity and by indirectly increasing customer satisfaction (Loureiro *et al.* 2012). The results are similar to the findings by Jiao (2010) who measured the extent to which companies meet the expectation of its stakeholders (such as employees, customers, communities and environment). Jiao's (2010) results showed that stakeholders' welfare represented intangible benefits. More specifically, stakeholders tend to associate employees' welfare and environmental performance with intangible value such as reputation or human capital. Other studies (Hossain *et al.* 2013; Luo & Bhattacharya 2006; Tsai *et al.* 2010) have also confirmed that socially responsible activities play a crucial role in improving a company's brand image, reputation and customer satisfaction and eventually improve financial performance.

A study by Becchetti *et al.* (2012) used an event methodology to investigate the market reaction to companies' entry and exit from the Domini 400 Social Index between 1990 and 2004, and their findings revealed that the announcements of exit from a social index affected a company's return negatively, which implies that investors react negatively to the decline in a company's social responsibility, shown by the exit from the social index. The results are similar to those of Shen and Chang (2009) who confirmed a positive relationship between CSR and companies' financial performance. The empirical findings support the view that CSR is highly associated with a number of direct or indirect financial benefits to the company. Thus, they support a positive relationship between CSP and CFP, suggesting that companies' engagement in CSR does not conflict with the goal of maximising a company's value, which implies that companies can improve their financial performance by improving their involvement in CSR. Furthermore, these findings tend to support the stakeholder approach that companies need to consider the needs of their various stakeholders to survive in the ever-changing situation of global competition.

Empirical evidence supporting a negative relationship between CSR and CFP

Expected negative relationship between CFP and CSR is based on the view that there is a trade-off between companies' financial performance and CSR. Advocates of this view propose that socially responsible companies tend to be at a competitive disadvantage because of the costs added by their involvement in socially responsible activities (Alexander & Buchholz 1978). This view of a negative relationship between CFP and CSR has been supported by empirical findings from different studies (Abiodun 2012; Lerner & Fryxell 1988; López *et al.* 2007; Wright & Ferris 1997). Lerner and Fryxell (1988) used a multidimensional approach to examine the effect of CSR on CSF, and their results showed that the social determinants of CFP tend to vary with the dimensions of CSR. In other words, the relationship between CSR and CFP

seems to be affected by adopted measures of CFP. Lerner and Fryxell (1988) concluded that there was a negative relationship between CSR and CFP. Using an event study methodology, Wright and Ferris (1997) investigated how US companies were affected by their socially responsible decision of removing their investment from South Africa from January 1984 to December 1990, and their results showed that this decision of divestment had a significant negative effect on the particular company's excess returns.

A study by Janney, Dess and Forlani (2009) used an event study method to investigate market reactions to commitment to a better social performance for European and US multinational companies and found a negative market reaction to CSR in US-based companies. Similarly, a study by Abiodun (2012) on 10 Nigerian companies during the period 1999–2008 found a negative relationship between companies' profitability and their investment in initiatives perceived to be of social responsibility. Higher profit margins were recorded for companies with less socially responsible activities. This was also confirmed by López *et al.* (2007) who used a bigger sample (110 companies) than Abiodun (2012) and obtained similar results. Findings from López *et al.* (2007) showed that there is a significant short-term negative relationship between companies' profitability and their investment in CSR. The negative relationship between CSR and CFP has therefore been empirically proved.

Non-significant and inclusive results on the relationship between CSR and CFP

An earlier study by Alexander and Buchholz (1978) used risk-adjusted market return to investigate the relationship between the stock market performance of a company and social responsibility. This study concluded that there was no significant relationship between the degree of social responsibility and stock market performance. Furthermore, there was no significant relationship between a company's social responsibility and its level of risk. Similar results were obtained from other earlier studies (Abbott & Monsen 1979; Aupperle, Carroll & Hatfield 1985; Chen & Metcalf 1980), which did not find any significant relationship between CSR and CFP. For example, Aupperle *et al.* (1985) concluded that there was no significant relationship between a company's socially responsible activities and its profitability, even when both accounting- and market-based measures were considered.

Studies conducted during the 1990s (Griffin & Mahon 1997; Roman, Hayibor & Agle 1999; Wood & Jones 1995) mostly focused on the review of findings from previous studies. Wood and Jones (1995) reviewed empirical studies on the correlation between CFP and CSR, and their conclusions showed that the relationship between CSR and CFP was still ambiguous because causality between CSR and CFP tended to be complex. Griffin and Mahon (1997) reviewed 51 empirical studies and categorised them into three categories

(negative effect, positive effect and no effect or inconclusive) based on their findings, and their results showed that out of 51 studies, 9 found no relationship between CSR and CFP or the results were inconclusive. However, their review had limitations as their findings disregarded methodological considerations of the studies under investigation, even if the methodology seemed to have an effect on the results.

The issue of methodological limitation was addressed by Roman *et al.* (1999) who modified and extended Griffin and Mahon's (1997) review by analysing the suitability of the methodology and measurement of CFP used by each study. Roman *et al.* (1999) reviewed 54 empirical studies, on the same topic, for the period of 25 years from the 1970s to 1997, and the findings showed that 14 out of 54 studies (approximately 26%) produced inconclusive results or found no significant effect between CSR and CFP, which confirms the inconsistent nature of findings on the effect of CSR on CFP. McWilliams and Siegel (2000) insisted that this inconsistency in results pertaining to the relationship between CSR and CFP was because of the flawed empirical analysis. They argued that the studies that used the model that excluded factors such as research and development (R&D) and advertising intensities was misspecified and would produce biased results, which emphasises that the contribution of methodological differences to the inconsistent results on the relationship between CSR and CFP cannot be ignored.

In addition to the studies that produced inconclusive or non-significant results on the relationship between CSP and CFP, there are studies (Inoue & Lee 2011; Kang, Lee & Huh 2010; Pelozo 2009; Renneboog *et al.* 2008) that produced mixed results on this topic. A study by Kang *et al.* (2010) used two different dimensions for measuring financial performance, namely accounting profitability and market value, to examine the effect of CSR activities on financial performance value across four industries (hotel, casino, restaurant and airline companies) of the hospitality sector in the USA from 1991–2007. Findings of this study showed mixed results across different industries, and these results tended to change with the method of measurement used. CSR was found to have a significant positivity effect on CFP in the hotel industry and a negative effect in the airline industry. However, Kang *et al.* (2010) found no significant relationship between CSR and CFP in the casino industry. The findings, therefore, suggested that the relationship between CSR and CFP tends to vary with the industry, supporting the use of a model (by McWilliams & Siegel 2000) that controls the industry factor.

Inoue and Lee (2011) conducted a similar study amongst companies within four tourism-related industries (airline, casino, hotel and restaurant), in which they divided CSR into five dimensions (employee relations, product quality, community relations, environmental issues and diversity issues) and tested the effect of each dimension on CSR. Companies' voluntary activities for community were found to have a significant negative effect on short-term profitability for the airline industry and a significant positive effect on

both short- and long-term profitability for the hotel and restaurant industries (Inoue & Lee 2011). Overall, Inoue and Lee's (2011) findings suggested that CSR dimensions such as diversity issues, employee relations, environment concerns and product dimension had a different effect on CFP, and such effects tended to vary across the four tourism-related industries. Moreover, the findings suggested that these dimensions of CSR affect short- and long-term measures of CFP differently.

Conclusion and recommendations

The review of empirical studies, from the 1970s to 2013, has showed that the relationship between CSR and CFP is inconsistent and that this inconsistency may sometimes be associated with the measures used to ascertain a company's financial performance. Some studies used profit maximisation as an indicator of a company's financial performance, which was reflected by accounting measures, whilst others focused on value maximisation, which is mostly related to the market value reflected by a company's share price. Hence, this may explain the inconsistent results on the relationship between CSR and CFP, as maximisation of a company's value is not always the same as profit maximisation. On the one hand, a large number of reviewed empirical studies supported a positive relationship, implying that the market tends to react positively to a company's involvement in CSR. These findings support the stakeholder approach which suggests that a company should benefit from meeting the demands of all its stakeholders. On the other hand, the existence of a negative relationship or inconclusive results between CSR and CFP suggests that there is no empirical consensus on the link between CSR and CFP. Hence, reviewed empirical studies confirmed the inconsistent results on the relationship between CSR and CFP. This inconsistency is the big ongoing debate on this topic, and it is possibly inevitable, given that the empirical studies test different hypotheses, use different methodologies and consider different sectors or industries at different time periods.

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Competing interests

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Effects of supply chain integration on lead time in the retail industry in Ghana

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Supply chain integration is concerned with the close alignment and coordination among parties within a supply chain as a means of improving performance. Inventory management of global supply chains presents challenges to retail businesses in developing economies where several uncertainties relating to order cycle, lead times and inventory decisions exist. This paper examines supply chain integration and its effects on lead times for the retail industry in Ghana. In the retail industry where products have varying shelf lives, the importance of supply chain integration is critical for performance and survival in a competitive business environment. A case study approach was used where purposive sampling was employed to select two retail giants operating in Ghana. It was found that an integrated supply chain results in significant reductions in lead times. Depending on the product category and the degree of supply chain integration, lead time reductions can be as high as 40%. A partnership relationship between the buyer and the supplier results in higher percentage reduction in lead times compared with the adversarial relationships. The benefits of reduced lead times include improved product availability, customer satisfaction, supply chain performance and efficiency. A partnership relationship is recommended to derive maximum benefits of supply chain integration. However, in a new, risky or hostile environment, an adversarial buyer-supplier relationship is recommended.

Introduction

A supply chain is an integrated process wherein raw materials are transformed into final products, then delivered to customers. Lambert, Cooper and Pagh (1998) defined supply chain management (SCM) as 'the integration of key business processes from end user through original suppliers, and information that adds value for customers and other stakeholders'. The Council of Supply Chain Management Professionals (CSCMP) noted that SCM encompasses the planning and management of all activities involved in sourcing and procurement, conversion and all logistics management activities. More importantly, SCM also includes coordination and collaboration with channel partners, which can be suppliers, intermediaries, third party service providers and customers. Monczka and Morgan (1997) among others noted that SCM seeks to enhance competitive performance by integrating the internal cross-functions within a company and effectively linking them with external operators of suppliers, operators to be successful. Lambert and Cooper (2000) argued that the extent of joint planning is expected to bear heavily on the success of the supply chain and that though different components may be emphasised at different times during the life of the supply chain, planning transcends the phases. Zigiariis (2000) noted that successful SCM coordinates and integrates all of these activities into a seamless process. This includes integration of supply chain partners such as vendors, carriers, third party companies and even information systems providers.

Supply chain integration is a performance-improving approach that develops seamless linkages between the various actors, levels and functions within a supply chain to optimise customer service. The objectives of supply chain integration are to improve efficiency and reduce redundancy while also enhancing product availability. Supply chain integration strives to better connect demand with supply, which can both improve customer service and lower costs. However, it is not always possible to simultaneously achieve all these objectives. Demographic data indicates that Africa's middle class population has tripled over the last 30 years, and the current trajectory suggests that this segment of the population will grow to over 1.1 billion by 2060 (cited in Africa Media Agency [AMA] 2014). The combined effects of population growth and increased urban migration include increased demand for goods and services and hence potential for significant retail growth. Also, Ghana has been identified as a country with a positive business environment in which foreign retailers can invest given its reputation for political stability and cultural tolerance (McTernan 2014). The objective of this paper is to examine the supply chain integration and the impacts of lead time in the retail industry with cases from Ghana. The premise

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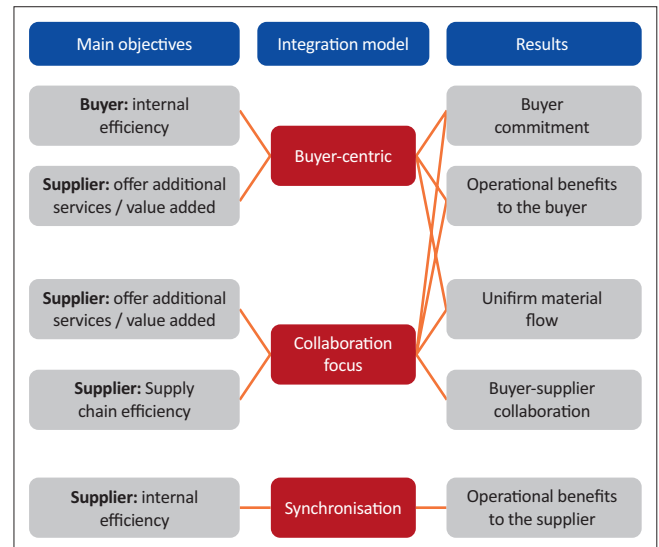
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is that lead time can be used as proxy to assess the efficiency and performance of the supply chain in competitive business environment.

Literature review

Integrated SCM is about going from the external customer and then managing all the processes that are needed to provide the customer with value in a horizontal way (Monczka & Morgan 1997). Generally, SCM comprises integrated functions from raw materials to final products. SCM also covers integrated management of every organisation throughout the whole chain. Supply chain integration can be defined as the extent to which all activities within an organisation and the activities of its suppliers, customers and other supply chain members are integrated together (Tutuncu and Kucukusta 2008). Supply chain integration is usually classified into two categories: internal and external. Internal integration is concerned with inter-functional interaction, collaboration, coordination, communication and cooperation within an organisation. In contrast, external integration involves interactions and collaborations with suppliers and customers and other partners in the supply chain that are external to the central company. Customer integration, also termed 'forward integration', is intended to ensure effective flow of products and services to customers. Supplier integration (backward integration) is concerned with collaboration and interaction of suppliers to ensure effective flow of supplies (Otchere, Annan & Anin 2013). Treville, Shapiro and Hameri (2004) noted that supply chain integration includes just-in-time delivery, reduction in supplier base, supplier evaluation based on quality and delivery performance, establishment of long-term contracts with suppliers and elimination of paperwork. According to Kauremaa (2013), it is possible to distinguish three main approaches to integrating supply chains that differ from one another in terms of the objectives they have and the results they produce. This is presented schematically in Figure 1.

1. **Buyer-centric integration:** A buyer-centric model is concerned about the efficiency gains for the buyer. The buyer seeks to streamline its operations and pays for this through accepting greater dependence on the supplier. For its part, the supplier looks for a return on its investment through greater customer loyalty to the supplier and satisfaction.
2. **Collaboration-centric integration:** In collaboration-centric integration, a channel is created through which the parties can discuss a wide range of issues at various levels between their respective organisations. This sort of approach can not only produce much sought after operational improvements but also a range of unexpected benefits that arise from the better understanding of supplier and buyer of each other's businesses.
3. **Synchronisation:** The synchronisation model is about the supplier making use of the increased transparency to improve its own operations. In this case, the buyer



Source: Kauremaa, J., 2013, 'Blurring boundaries to deliver results: Supply chain integration', White Paper, viewed 28 June 2015, from <http://www.relexsolutions.com/blurring-boundaries-to-deliver-results-supply-chain-integration/>

FIGURE 1: Supply chain integration approaches.

might, for example, look to outsource responsibility for replenishment to its supplier in the hope of receiving better service. The supplier, in turn, can cover the cost of the extra work by reducing its inventory levels as a result of the improved visibility and thus reduced uncertainty.

Lead time: Lead time is defined as the latency between the initiation and the execution of a process. Lead time is the key issue for enhancing performance of organisations across various industries (Treville et al. 2004). Lead time is a major consideration for retailers and customers in the supply chain. Higher levels of integration results in reduced lead times. Chopra, Reinhardt and Dadahardt (2004) showed that by decreasing the lead time uncertainty, the required safety stock increases. Singh, Sohani and Marmat (2013) noted that in an information-enriched supply chain, firms are closely connected with suppliers and customers both internally and externally because of information sharing resulting in reduced lead time and increased performance. Lead time can be measured in a number of ways, including manufacturing lead time (Jayaram, Vickery & Droge 1999) and customer lead time (Duenyas & Hopp 1995). Customer lead time is the time elapsed from receipt of an order until the finished product is either shipped or delivered to the customer. This paper focuses on customer lead time. Various variables can help reduce the lead times of products or delivery in the retail sector. Because the retailer does not normally add any value to the product yet to be distributed the final consumer, integrating supply chain in relation to lead time reduction is essential in satisfying customer's demand. The retail industry is much concerned about delivering goods and services to the final consumer. This means delivery is of essence; therefore, ways to reduce lead time must be considered to get the product as close to the consumer as possible and on time.

Retail industry landscape in Ghana: According to Deloitte (cited in AMA 2014), 'Africa's middle class has tripled over

the last 30 years, and the current trajectory suggests that the African middle class will grow to 1.1 billion in 2060, making it the world's fastest growing continent. This growth, coupled with the forecasted GDP growth of over 6%, drives the potential for retail growth on the continent significantly through increased purchasing power and consumer demand'. According to the African Retail Development Index (AMA 2014), African retailers such as South Africa's Company A, which operates in more than 16 African countries, and Nakumatt, which is based in Kenya which operates in 4 East African countries, have done most of the expansion, but global retailers are moving in. For example, in 2011, Wal-Mart acquired South Africa's Massmart, and it plans to open 90 supermarkets across Africa over the next 3 years. It is noteworthy that the characteristics of supply chains in Africa are more challenging than many other markets in the world. Therefore, it is important to acknowledge and understand these challenges to develop strategies to mitigate the risks versus the opportunities which the continent offers.

In Ghana, the landscape of retail is changing rather rapidly where consumers are gradually shifting from the traditional open market shops to supermarkets. McTernan (2014) noted a recent study that most Ghanaians still do their weekly shop at street markets (69%) or from street vendors (26%), while 17% now shop in supermarkets. In other words, even though retail business is huge, the formal retail sector in Ghana is very limited and the biggest component of the retail industry is informal trade. Regardless, the formal retail market in Ghana is visibly and rapidly expanding. According to McTernan (2014), 'new shopping centres are sweeping the continent, and they are bigger, shinier and busier. In West Africa, Ghana is taking the lead with the largest in the region'. The Accra Mall, which was built in 2007, has a capacity of 20 000 square metres of retail space. The \$100 m West Hills Mall was completed in 2014 and covers 27 700 square metres. According to McTernan (2014), Ghana is considered an ideal location in West Africa because of 'political stability, lower costs and the ease of doing business have meant that retail investors can plan for the long term and use the country as a growth hub, attracting customers from across the region'. South African companies are leading the way in retail development in Ghana. In another study (Euromonitor News 2015), Ghana is seen to be on track to becoming Africa's next hotspot for retailers. Ghana has been identified as a country with a positive business environment in which foreign retailers can invest. The country is developing a reputation for political stability and cultural tolerance and has made huge strides in diminishing its poverty problems. According to the study, Ghana is also seen as the doorway for foreign investors to tap the 250 million consumers in the region, and an exit point for landlocked nations such as Niger. Moreover, as an English-speaking nation, Ghana has close ties with American and British businesses. This reflects the strength of fast moving consumer goods (FMCG) companies in the country (Euromonitor News 2015).

Methodology

Given the diversity of the retail industry in terms of type and size, a case study approach was adopted for this study. Yin (2003) noted a case study is an empirical inquiry that investigates a contemporary phenomenon within its real-life context especially when the boundaries are not clear between the phenomenon and the context. Yin (2003) further argued that the unique strength of case studies is its ability to deal with a full variety of evidence—documents, interviews and observations. According to Baxter and Jack (2008), qualitative case study is an approach that facilitates exploration of a phenomenon within its context using a variety of data sources. The case study approach is considered appropriate for this research. The study involved data collection through interviews of key players and analysis of historical data.

Case selection and data collection: Purposive sampling was employed to select two retail giants operating in Ghana that are of foreign origin. To conceal the identities of these companies, there are referred to as Company A and Company B. These two companies being of foreign origin, obviously obtain their goods from both local (Ghanaian) and foreign suppliers. Even though the sample size may not be statistically representative, they invariably reflect the general characteristics of retail companies that have integrated their operations with partners in their supply chains. However, the selected companies can be considered to be representative of the experiences and practices of the foreign retail companies operating in Ghana, which is becoming a fairly competitive market place. The sample does not include indigenous Ghanaian retail companies. Therefore, no comparative analysis between foreign-based and local retail companies could be conducted. The focus of the study is to examine the impacts of supply chain integration on lead time, which is critical for the foreign-based retail companies. Data was collected through interviews and analysis of historical data.

Interviews: For the interviews, a semi-structured guide was used. The questionnaire was structured to capture information on the categories of products, the sources of merchandise (foreign and local), average lead times and levels of integration, as indicated by supplier relationship and experiences with suppliers and suppliers' supplier, as well as information sharing among retailers and suppliers. The respondents were selected based on their knowledge of inventory and procurement policies and practices and the operations of the company.

Historical data: In an attempt to measure the impacts of supply chain integration on lead time, a few categories of products that are common to the two companies were selected and the lead times before and after integration were analysed. It should be noted that the boundaries between none and full supply chain integration are not clearly defined for both companies. Furthermore, there are differences among the lead times for the individual products in each category. Consequently, for the purposes of this analysis, the lead times before and after integration are average values for the categories of products.

Findings and discussions

In general, the two companies sampled sell identical products with a few exceptions. Company A indicated that 60% of their products are sourced locally and 40% from foreign sources. The corresponding figures from Company B are 55% local and 45% foreign. The average lead times of locally sourced items are 7 and 5 days for Company A and Company B, respectively. The lead times for foreign items are about 10 times longer than the locally sourced items. These lead times present the average of all products (local of foreign). Depending on the origin of the item, the actual lead time could be shorter. The reasons for long lead times for foreign-sourced items (especially those arriving by sea) cannot be explained herein partly because the actual origins were not disclosed. However, the long lead times could be attributed, in part, to the long processing times at the sea ports of entry. Information gathered clearly indicated that the partners in the various supply chains have established collaborative relationships where they share information relating to sales figures, customer complaints, and stock inflow and outflow. The two companies also confirmed that the multi-tier relationship with the suppliers and suppliers' supplier has helped to receive goods and services earlier than the anticipated lead time.

The ordering systems or replenishment practices are however different. Company A uses an Automatic Ordering System that is configured to monitor inventory levels and generate orders for replenishment. Obviously this company uses the continuous inventory monitoring system. In contrast, Company B has two systems of ordering: (1) corporate order which is sourced from South Africa and (2) local orders which are raised through a local third party agent.

In assessing the impacts of supply chain integration on lead times, three categories of products were selected: groceries (fruits and vegetables), household goods and appliances. The suppliers of these groups of products are different for the two retail companies. Table 1 compares the lead times before and after supply chain integration for the three product groups. It is noted, in general, supply chain integration results in significant reduction in lead times. It is also noted that even though the retail companies use different suppliers, the percentage reductions in lead times are identical for a given product group. Between the two companies, Company B appears to experience high reductions in lead times following supply chain integration compared with Company A. For example, for groceries, Company A experiences about 44% reduction in lead time

while Company B enjoys roughly 55% reduction in lead time. The reasons for the marked differences in lead time reductions between the two companies are not clearly evident. However, the differences could be attributed several factors including the type of buyer–supplier relationships, degree or level of supply chain integration, efficiency of the suppliers, among others.

Buyer–supplier relationships

The two companies each has a platform for sharing information concerning improvement of relationship, indicating that they use that for frequent meetings. However, they have different types of business relationships with their partners in the supply chains. Company A has adversarial relationship with its suppliers, whereas Company B maintains a partnership relationship. A partnership relationship is a tailored business relationship based on mutual trust, openness, shared risk and shared rewards that results in business performance greater than would be achieved by the two firms working together in the absence of partnership. Partnerships, however, are costly in terms of the time and effort required. In contrast, adversarial relationship is one wherein businesses treat each other and their clients as adversaries instead of as partners. There is little or no trust between them, and their means of communicating with each other is very formal. They do not have direct contact and no direct involvement in each other's activities. In the right business environment, a partnership relationship is the appropriate approach, but in a risky and hostile environment, it is best to apply an adversarial approach (Differencebetween.net).

In terms of integration, the type of buyer–supplier relationship appears to suggest that Company A which maintains adversarial business relationship adopts the buyer-centric model which is concerned about the efficiency gains for the buyer. In this model, the buyer seeks to streamline its operations, for example by reducing the amount of manual work in order processing. The buyer pays for this through accepting greater dependence on the supplier. Company B which operates the partnership relationship appears to adopt the synchronised integration model. In this model, the buyer (i.e. the retail company) outsources responsibility for replenishment to its suppliers in the hope of receiving better service. The suppliers make use of the increased transparency to improve their own operations, for example, reducing its inventory levels as a result of the improved visibility and thus reduced uncertainty. Regardless of the type of business relationships, both companies have multi-

TABLE 1: Comparison of lead times for select products.

Variable	Company A			Company B		
	Groceries	Household and personal care	Appliances	Groceries	Household and personal care	Appliances
Lead time before SCI (days)	12	12	31	9	11	30
Lead time after SCI (days)	7	7	27	5	5	21
Reduction of lead time (days)	5	5	4	4	6	9
% Reduction of lead time	42%	42%	13%	55%	44%	30%

tier relationships with their partners, that is, relationships with the suppliers and their supplier. The essence of this to ensure that the logistics requirements are met, quality is not compromised and cost is effectively managed. Information from the interviews indicates that multi-tier relationship has helped to receive goods and services earlier than the anticipated lead times.

Trkman and Groznik (2006) described different benefits of supply chain integration to include enhancement of the process of information sharing inside-out of the organisation resulting in cost reduction. It also enables retail organisations to do effective renovation and business process modelling which increase efficiency and profit margins. Li, Ragu-Nathan, Ragu-Nathan and Rao (2006) also added that supply chain integration enables the organisation to gain a sustainable competitive advantage and enables it to realise its goals and objectives. Singh *et al.* (2013) also concluded that investing in levels of connectivity and interdependency through supply chain integration results in reduction in lead time

Conclusion

There are different models or approaches to collaboration between buyers and suppliers. In the retail industry where products have varying shelf lives, the importance of supply chain integration is critical for performance and survival in a competitive business environment. An integrated supply chain results in significant reductions in lead times. Depending on the product category, and the degree and maturity of the supply chain integration, lead time reductions before and after integration can be as high as 40%. Furthermore, a partnership relationship between the buyer and the supplier is considered the preferred approach because it results in higher percentage reduction in lead time compared with the adversarial relationship. However, in a risky and hostile environment, it is best to apply an adversarial approach.

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Competing interests

The authors declare that they have no financial or personal relationship(s) that may have inappropriately influenced them in writing this article.

Authors' contributions

E.D.F. (Ghana Institute of Management and Public Administration) and A-V.B. (Ghana Institute of Management

and Public Administration) contributed equally to the writing of this article.

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e-Government: Institutional and environmental challenges

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The design, development and implementation of e-Government applications are affected by several factors, which include institutional and environmental challenges within the organisation. To understand these institutional and environmental challenges, 36 South African senior civil servants from the national government were interviewed. The interview data were analysed using principles of content and interpretive analysis. A key institutional and environmental challenge is related to the problems that affect senior managers. Senior managers are frustrated, disenfranchised or expunged of managerial authority, which in turn has an effect on the design, development and implementation of e-Government applications. The practical implications of this research are that in the government the management structure within the state has to show a greater level of agility, and the government should proactively engage with key stakeholders within the state to develop a common shared vision for the use of e-Government applications.

Introduction

e-Government application design and development is at the heart of any e-Government initiative because during the design process what is offered to the citizens and how it will be of value to them are decided. The designing of e-Government applications is a challenging issue because the applications are frequently large and complex and require large sums of money, the system's objective can be difficult to define, senior government officials who do not have adequate information and communications technology (ICT) expertise sometime interfere and they have a fairly wide range of stakeholders who need to feel that the e-Government application is providing some form of benefit to them. According to Abrahams (2009), South African e-Government applications face challenges because of the fragmented nature of the government's administration and its communications processes. Furthermore, unlike many other ICT applications, e-Government applications are often conducted under public scrutiny. When mistakes are made in e-Government applications, they tend to be expensive, impact large numbers of citizens and are embarrassing to civil servants and politicians (Singh & Averweg 2015). e-Government applications require adequate online services, infrastructure and human capital, but with all these in place, the issue of making individual systems work still remains, which depends on how the government's designers design, develop and implement the systems, which is the focus of this research.

Background

The design and development of e-Government applications is not an extensively researched area for either the developed or the developing world; the current e-Government research appears to be policy-focused (Hernández, Bolívar & Muñoz 2012). Grönlund and Horan (2004) pointed out that the literature on ICT in the government can be traced back to the early days of data processing in the 1970s, which were long before the Internet and the Web were developed¹. In more recent years, the governments became aware of the advantages of employing Internet technologies to facilitate service delivery as a result of becoming aware of its success in the e-business sector (Bannister 2012; Becker, Algermissen & Niehaves 2006; Worrall 2011). The US National Performance Review (Heeks & Bailur 2007) first used the term e-Government in 1993 (Annttiroiko 2008). The Government Direct Green Paper, one of the first government publications on e-Government in the UK, was published in November 1996² and outlined the way in which the government was going to use ICT (ePractice.eu 2007) to deliver services. In 1997, the National Performance Review in the USA recommended the use of ICT to deliver services to citizens (Relyea & Hogue 2004). The first academic paper to use the term electronic

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code with your
smart phone or
mobile device
to read online.

1. It is argued by some authors that the government's use of technology began with the use of Herman Hollerith's card readers in the 19th century when it was employed in order to facilitate the completion of the census counting.

2. This green paper represents a prospectus for the Electronic Delivery of Government Services.

government was published in 1996 by Milward and Snyder, who defined electronic government as the 'use of technology to link citizen to government services' (Milward & Snyder 1996:262). Almost two decades of experience, with numerous types of e-Government systems being developed, e-Government systems still experience crippling challenges (Abu-Shanab & Khasawneh 2014; Dombrowski *et al.* 2014; Gauld & Goldfinch 2006). In this context, poor investment decisions have not only been made in situations where there has been an inadequate return on investment, but also include incidents where ICT applications failed to work or caused considerable disruption to the organisations attempting to apply the technology (Belardo, Ballou & Pazer 2004; Gauld & Goldfinch 2006; Heeks 2002a, 2002b, 2002c; Mitev 1996). Estimates of the extent of e-Government failures range considerably. The New Zealand Government lost a modest \$17 million on ICT for health care, when it purchased an American-developed ICT system which was designed to manage health information and then abandoned the system within two years (Gauld & Goldfinch 2006). The Irish Government spent an estimated €156 million on a Health Services Administration system called PPARS and obtained no return on the investment (Comptroller and Auditor General 2005). But in the UK, where government services are much larger, the National Health Service wasted an estimated \$24.5 billion on an ICT health care system which they were not able to successfully implement (Heeks 2007).

Purpose of the study

The purpose of this research was to identify and explore issues related to the institutional and environmental challenges that affect the development of e-Government applications in South Africa. Furthermore, the study proposes a theoretical conjecture on how senior managers deal with issues related to institutional and environmental challenges. In the South African context, adequate attention has not been paid to how institutional and environmental challenges affect the development of e-Government applications because of the challenges researchers experience in getting access to senior government managers. The research question for this study is: What are the issues that affect senior managers within the government?

Methodology

The research strategy that was used in this research was qualitative in nature. A qualitative approach is important because the evidence that was required to develop a better understanding of issues related to institutional and environmental challenges could not be collected using an experimental design. The evidence required had to be collected from knowledgeable informants, in the form of interviews, who have been involved with or interacted with e-Government applications. In addition to the interviews, the evidence also comprises reports, government website examinations, project documents and media reports. The data required to answer the research question were primarily

qualitative in nature. To understand how the South African Government develops and implements its e-Government applications, it is necessary to investigate how proposed applications are conceived; how these ideas are taken from a conceptual state to a project or programming phase; how the planned applications are then actualised; and what type of benefits the project sponsors and/or champions expect to achieve. Myers (2009) argued that it was important to use a focused, structured, context-specific dialogue for the open exchange of ideas and meanings for a clear understanding. In the context of this qualitative research, dialogue is not only an appropriate method for data collection (Costantino 2008) but a highly effective one. Furthermore, qualitative research is iterative in nature (Mills, Eurepos & Wiebe 2010; Yin 2011); a useful way of understanding this was provided by Remenyi (2012) who pointed out that when using a qualitative approach for data collection, such as interviews, the researcher was involved in a learning experience in which the data collection technique, as well as the instrument, might be improved by means of an iterative feedback loop. This feedback loop is important because it gives the researcher the opportunity to reflect on the research instrument and the process of data collection. The research method involved identifying informants within the South African Public Service Sector who have direct involvement with e-Government policy development or project implementation and evaluation. These informants were interviewed on a face-to-face basis, and the discussions with them were recorded. Transcripts were prepared and used in conjunction with other documentary evidence for data analysis. Data analysis was performed by using principles of content analysis and interpretive analysis. The unit of analysis for this research is the decision-making process which is employed across a number of different government entities.

Selection of informants

The following heuristic was used in the selection of informants. Informants had to have worked for the government. Informants could be employed by the national government, the provincial government, the local government or a government agency. Practical and logistical concerns that influence the selection of informants are:

government officials are geographically dispersed, both the prospective informant and researcher have time constraints, the researcher has limited funding, the ethics protocol is a guide for the researcher not to wander outside the boundaries of the accepted interview questions, and the researcher is unknown to the prospective informants.

A further selection of criteria is applied: 'prospective informants must be involved with, or be affected by, government ICT and prospective informants must be at a senior or upper management level in the public sector'.

If informants met the criteria, they were interviewed. All informants who were interviewed were senior managers. They were not contractors and therefore are considered civil servants as they are permanently employed by the state.

The informants are categorised into four groups: national government, provincial government, local government and government agencies. There were:

- 16 informants from 9 different departments that represented national government;
- 4 informants from 4 different departments that represented provincial government;
- 3 informants from 3 different departments that represented local government; and
- 13 informants from 7 different government agencies.

Research consent forms and information leaflets were provided before the interview to the informants and on the day of the interview. Only after the informants had signed the Informed Consent Documents, did the data collection process start.

Data collection

The method of data collection for this study was semi-structured interviews (Leedy & Ormrod 2010; Saunders, Lewis & Thornhill 2009). Semi-structured interviews were appropriate because they give the researcher some structure, whilst allowing the researcher the opportunity to explore in depth important issues as they arose. The questions that were posed to informants were derived from the extant literature and a three-round Delphi study (Singh 2013) that was used to acquire a deeper understanding of the issues that affect e-Government. Informants were asked the following question:

‘Can you please describe the management approach that is used in the design and development of e-Government systems?’

- a. Please describe the management approach.
- b. If there is no management approach, who would take charge and ownership? ‘How does this happen?’

Data analysis

The two principal approaches to analysing qualitative data are content analysis and interpretive analysis. Content analysis requires counting the concepts discussed with the informants to develop and understand the situation. Interpretive analysis looks beyond counts of concepts to a direct understanding of the meaning of the data obtained. Atlas.ti facilitated the coding of the transcripts and allowed the researcher to group codes, concepts and constructs. Figure 1 shows the coding cycles. The transcripts were uploaded to Atlas.ti, and codes were developed. In the first cycle of the coding, the text was read, reflected upon and then key issues in the text were identified and coded. The 913 quotations represented the key issues in the text. Further reflection on the quotations resulted in the quotations being reduced to 280 codes. During this phase, the quotations that presented the same type of issue were grouped together. In the second cycle of coding, after reflecting on the codes, the codes that presented similar issues were grouped together to develop 42 concepts. Then in the third cycle of the coding, after reflecting on the 42 concepts, these concepts were reduced to 8 themes. One of these themes related to institutional and environmental challenges, which is the focus of this paper.

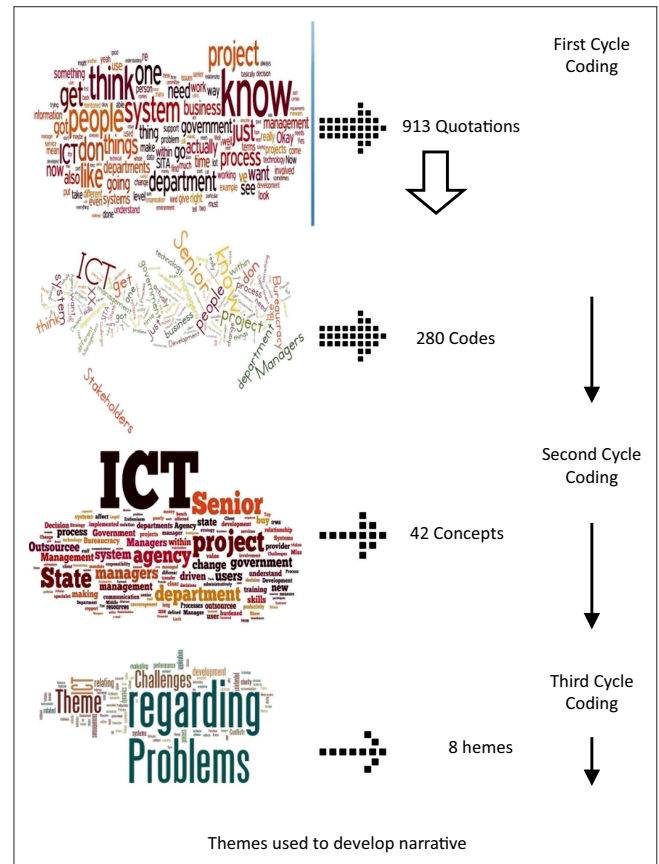


FIGURE 1: The three-phase coding cycle.

Findings

Institutional and environmental challenges to e-Government applications

Institutional and environmental challenges refer to the organisational setting within which e-Government applications are designed and developed. Different organisational settings have a direct impact on how ICT opportunities are perceived, how systems are designed and how the organisation implements them in order to take advantage of their potential benefits (Bannister 2012). The development of e-Government applications happens in an environment that is traditionally inflexible and not conducive to creative ICT development and structural change as a result of ICT initiatives. The implications are that the government may not realise the benefits of the proposed e-Government application. From the analysis, the elements within this theme are: problems affecting senior managers; problems regarding the appropriate use of ICT; problems regarding organisational process; problems regarding policy; and problems regarding clarity of ICT strategy. These themes are discussed in the following section.

Problems affecting senior managers

Informal communication affects senior managers' (and users') perceptions of e-Government applications. Informal communication is a casual exchange of information and

some informants referred to this type of communication as the grapevine. This is demonstrated by the following comments from informants:

'Most people [*managers and users*] would be vaguely aware through the grapevine that there is something happening'.

'I [*senior manager*] tend to keep my ear to the ground whenever something [*new ICT projects*] is coming down the line'.

'I think that was quite helpful because those are very influential people. If they [*senior managers*] say they are not happy regardless of whether there was a mistake in, you know, small thing as a semicolon, if he's not happy and he broadcast that then everybody is not going to be happy'.

Further, senior managers who are not ICT savvy assess the merits of e-Government initiatives. Senior managers who are not ICT savvy do not understand how ICT is used in the organisation or are under-prepared to understand ICT. These senior managers struggle to make decisions, as demonstrated by the following comments from informants:

'So it's a crisis management [*in relation to ICT projects*]. It's not a management by objective'.

'They [*senior managers*] can't see that [*in relation to the ICT project*], if they do this like this [*make a particular decision*], the consequences a year, two years, three years, probably get down the line, is going to be that...'

However, if an ICT person is able to package the problem and solution in an elegant, trustworthy and understandable manner, then the senior management will be inclined to accept the proposal. Packaging the problem refers to the senior manager understanding the economic issues related to the e-Government application. This is demonstrated by the following comment from an informant:

'if I went to my leadership [*director*] with a problem and I said, look, we have to spend 5 million rand, doing a particular thing and that particular thing would enable the project to go live more smoothly, you know, the questions would be around budget availability and all that and does the cost justify it. But once they are satisfied with the fundamental information, they would then support me'.

In addition, senior managers in government are being reassigned or are being moved horizontally within the government to other posts in different departments. These types of movement have an unsettling effect on the productivity of the department, as demonstrated by the following comments from informants:

'I must say, last time I was in a different unit than where I am now because we were not restructured yet'.

'We've had some structure changes lately. And those people [*directors*] are relatively new; they're finding their feet and one day they will be settled'.

'We then went and did business processes and did full enterprise architecture for a further 10 million, so that's 13 million gone. New head of strategy [*director*] came in and said forget about that and they appointed consultants to reengineer the organisation'.

Senior managers find themselves in a position of frustration because they are stripped of their decision-making authority, and these decisions are made by committees. This is demonstrated by the following comments from informants:

'we [*senior managers*] do not have the powers to make decisions, because most of the time you know, you find that there is a challenge A [*lack of skills, resources, understanding*], you know how to resolve it technically, however because you haven't run this past your director or your superior you cannot say that in a meeting, in a project meeting'.

'And then I just lost interest in Knowledge Management in government basically because you know, you can't ... on a stranglehold'.

'people from private sector they don't last in the government because you [*senior managers*] are so alone in the process, you are trying to push, you are trying to make a difference and all that but people are not receiving it that way'.

Besides senior managers being frustrated, senior managers do not understand how the technology is being applied, as demonstrated by the following comments from informants:

'They find it difficult to conceptualise technical problems or the technical jargon and so you might get some unreasonable requests'.

'The previous DG [*director general*] came from arts-related background. I don't think he ever switched his laptop on'.

'... it's literally just rubberstamped by the senior management [*directors*] because they do not have the technical background to really decide whether this is something that is going to fly or not. That's why they are going to the advisory panel I think'.

Senior managers' lack of understanding of how ICT is applied in government leads to the problems regarding the appropriate use of ICT. The narrative excerpts from the informants illustrate that there are gaps in understanding (Singh 2013) by senior managers on how to effectively use ICT. These gaps in understanding create challenges that subordinate members of staff recognise, but in most cases they are unable to do anything about these challenges.

Problems regarding the appropriate use of ICT

The problem regarding the appropriate use of ICT in government is a phenomenon that is characterised by a low level of understanding of how e-Government applications are developed and designed. This is demonstrated by the following comments from informants:

'I think a lot of them [*senior managers*] don't understand information technology, they don't understand what information technology can do and sometimes when a project has possibly been not successful or it's been floored they may have a negative view about information systems what they can do'.

'the application of ICT in particular areas of government is seen as a 'foreign concept', for example the application of voice recognition applications'.

Also within the government there is strong scepticism amongst civil servants as to the creditability of the information produced by e-Government applications, as demonstrated by the following comments from informants:

'I think that is in their minds [*managers and directors*], I think in a way they are still sceptical about whether the system has really managed to get them the information that they are looking for'.

'You see, even if you [*managers and directors*] are afraid to take that step you will also not trust those systems that keep that data, yeah'.

Next, senior managers are in ivory towers or are disconnected from the realistic application of ICT. Senior managers who are in ivory towers do not understand how or when to use ICT appropriately, as demonstrated by the following comments from informants:

'a senior manager team would make a decision to implement something and even a guy that is at a level below me ask him a question that should have been asked by one of his peers in the meeting where they made a decision and you know, they don't respond'.

'...it is very painful or sad because you sit in a meeting with senior management, executive management of the organization and you would see your CIO giving information that does not make sense there, but you can't say it to them and even when you come back and say you know what you have committed to this thing, and that's not the way you are doing, you are going to have problems here and here and here and being the way they are they will never go back and say you know what I made a mistake maybe you know for what reasons but I believe that if you go back and say you know what I think this might not work and come up with an alternative before you can spend the money they might respect you and trust you'.

'But the senior managers [*directors*] they don't see that problem because it's just too distant from where they are sitting. It sounds like a very logical business requirement because everybody is using like this'.

A further reason why there are problems regarding the appropriate use of ICT in government is because some senior managers do not lead by example and use the technology at their disposal, as demonstrated by the following comments from informants:

'Some of the very senior people won't even use a PC, some of them won't even type a word, some of them don't even know how to type in Word. So it's a huge challenge. It's a difficult thing, but the organization works around it'.

'...secretaries answer all their bosses' email'.

Because senior managers are not using the technology and have downward delegated the management of their communications, a level of bureaucracy in the organisational process is created.

The narrative from informants illuminates that there is a lack of appropriate ICT knowledge (Pihir, Tomicic-Pupek & Androcec 2013) amongst senior managers. This leads to a situation where it is a challenge to introduce, design and develop e-Government systems. A further consequence is that the entire process of delivering an e-Government system becomes slow.

Problems regarding organisational process

There are several types of organisational process problems (bureaucracy) that exist in government. These problems are agreed to bureaucracy, prolonged bureaucracy and difficult bureaucracy. Agreed to bureaucracy is a bureaucracy that all key stakeholders have negotiated and agree to, as demonstrated by the following comments from informants:

'...we decided to go through a committee structure in order to make sure that the decision making is appropriate'.

'It is a bureaucratic approach but it's an agreed process on both sides, that is, the change request procedure that you would follow'.

'Any project or any initiative that needs to be approved goes through the IT steering committee, and essentially after that goes to the head of department for approval. So nothing happens in the IT space without approval from the head of department'.

Prolonged bureaucracy is a bureaucracy that is characterised by prolonged delays in time before any action can be taken, as demonstrated by the following comments from informants:

'And that put the whole thing [*ICT initiative*] in another year, took another year to get everything signed. And struggled to trace where the documentation was and what was holding it up'.

'...it [*approval*] can take long, very long, what I mean by long is it's not a measure of few days or just a week, it can take very long because people have to sit and because ICT is a bit specialized, there aren't many people who are able...'

'After 18 months of trying [*seeking approval*], there's a lot of, the internal processes are very sluggish, very, very sluggish'.

Then there is difficult bureaucracy. Difficult bureaucracy is characterised by ambiguities within the organisational process, as demonstrated by the following comments from informants:

'We have many levels of management. In fact to be precise I think we have 22 levels of management'.

'...but most of the time it's budgets are the problem. In order to get something done now, in the next financial year in March, you should have motivated for it long, long time ago, early last year already so that it's on the radar'.

'I do not know how to make contact with another department, can I phone them, must I ask the DG [*Director General*] to phone them, and it's bad'.

The bureaucracy of the government is associated with policies within the government.

This series of narratives from the informants illustrates an issue of poorly managed public expenditure that do not produce efficient public services because of waste, delays, mismanagement or poor organisational and management skills (Heeks 2000a).

Problems regarding policy

ICT policies development within the government is a top-down approach. This is demonstrated by the following comment from an informant:

'in every policy process, you have to go to -- you know once it's been to top management [*director general*] and to the minister and then it has to go to the cluster'.

However, there are those managers who ignore the restrictive policies, as demonstrated by the following comment from an informant:

'...they [*directors*] just say don't worry about the policy but you know, you can be held liable for it'.

Policies are only effective if there are well-coordinated strategies that support the policy.

Currently, within the South African Government there is no ICT policy or policy regarding e-Government applications. This creates a challenge as each department has different expectations and there are no policies to guide the department.

Problems regarding clarity of ICT strategy

In the case of the South African Government there is no ICT strategy. Although there is an ICT policy, the following comment from an informant demonstrated this point: 'There is not an ICT strategy for government, okay'.

Informants did not want to openly discuss the government's ICT strategy claiming that the ICT strategy has to come from senior government officials. This lack of a clear ICT strategy has an effect on the modernisation of the government.

In the absence of an ICT policy, there will be no ICT strategy. Each department has to develop their own strategy. It is difficult to develop a strategy when departments have competing mandates, limited resources and a poor understanding of ICT. In summary, these institutional and environmental challenges have a negative effect on the introduction, design, development and implementation of e-Government applications.

Limitations

The primary limitation of this study was that only senior managers from the national government were interviewed. This is the first study that interviewed senior managers in the government and there are no previous studies to compare the findings with.

The theoretical conjecture

The reported finding has been consolidated and refined to produce the following theoretical conjecture:

'Driven by a poor ICT strategy and a top down management approach, senior managers in government experience challenges in understanding the design, development, implementation and the appropriate use of ICT. To bridge this understanding gap the following approaches has been adopted: if an ICT person can demonstrate the value of the project the senior manager is more inclined to support the proposed ICT project. The second approach is the use of ICT committees. These committees are plagued with crippling bureaucracy, which encourages informal communication channels. This leads to scepticism amongst civil servants. A further challenge is that senior managers in government are being reassigned with government'.

Figure 2 shows a graphical representation of the theoretical conjecture. Senior managers are affected by several challenges, and in an effort to manage these situations they develop coping strategies that have less than optimal outcomes.

Practical implications

This study has several implications for both the government and the state. It is incumbent on the present government, elected for a defined period of time usually 5 years, to ensure that the government officials that they deploy to head up different arms of the state are appropriately qualified to do so. The consequences of not doing so lead to a situation of conflict between the government employee and the state employee. This conflict situation has an adverse effect on state departments. The state employees, who are generally full tenure civil servants, become frustrated or disenfranchised or the managerial authority is decommissioned. This then leads to a situation where the vision of the government employee is difficult to achieve. For the successful design, development and implementations of any e-Government application, all key stakeholders, government and state need to share the same common vision and mutual respect for each other. Further, there is a power relationship between government employees and civil servants. Civil servants influenced

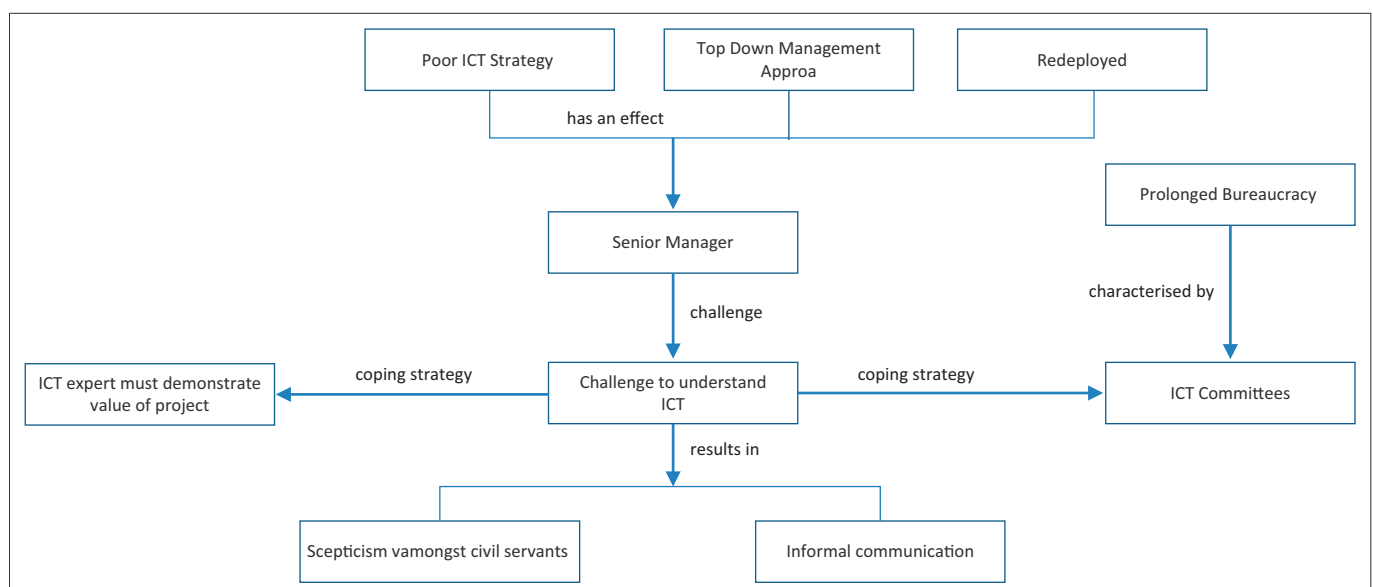


FIGURE 2: Theoretical conjecture.

by their ministers may attempt to be agents of change in technology. It has been known that ministers issue directives to their departments to implement particular systems within a pre-defined time period often attached to their term of office (Mooij 2007; Sudan 2002). The ICT personnel, who do not wish to disappoint the minister, hastily try to develop solutions and in their endeavours may compromise the development process. To minimise these types of power relationships, it is important to have clear management structures that are flexible and adapt to change. There are also managerial implications from this research. There appears to be a problem with managerial systems and structures that are designed to remove managers' authority and replace it with difficult bureaucratic processes which leads to a situation where the technology is advancing at a much greater speed and the governments developing legacy applications. The management structure has to show a greater level of agility.

Thus, government should proactively engage with key stakeholders from the state to develop a common shared vision. E-Government applications have less to do with technology and more to do with the people who are the champions of these systems.

Conclusion

In the context of this study, the likelihood of e-Government applications being successful would increase if there is a shared and accepted vision between the government and civil servants. A certain level of harmony must exist between the two and civil servants must neither fear nor feel threatened by government representatives. e-Government applications are only a tool by which the government executes the mandate of their constituents, but the success is dependent on the people entrusted with the execution of the application.

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Competing interests

The author declares that they have no financial or personal relationship(s) that may have inappropriately influenced them in writing this article.

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ETF indexation methods: A risk-adjusted performance analysis

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Increasing sophistication of exchange-traded fund (ETF) indexation methods required that a comparison be drawn between various methodologies to establish the benefits of such product innovations. A risk-adjusted performance evaluation of four pre-selected ETF indexation categories was conducted to establish how alternative ETFs compare to standard market capitalisation-weighted ETFs. The research methodology involved that fundamentally weighted, equally weighted and leveraged ETFs were compared to traditional market capitalisation-weighted ETFs on the basis of risk-adjusted performance measures. Using a sample of South African and American ETFs, several risk-adjusted performance measures were employed to assess the risk and return of each indexation category. Special emphasis was placed on the Omega ratio because of the unique interpretation of the return series distribution characteristics. Findings show that fundamentally weighted ETFs outperformed the other categories during an upward moving market when using standard risk-adjusted performance measures. Moreover, the Omega ratio analysis revealed inherent unsystematic risk in alternatively indexed ETFs, and ranked market capitalisation-weighted ETFs as the best performing category. Equal-weighted ETFs delivered consistently poor rankings, whilst leveraged ETFs exhibited a high level of risk associated with the amplified returns of this category. The study highlights that recent ETF developments bring unique risks that require cautious implementation of alternative ETFs into a portfolio.

Introduction

Exchange-traded funds (ETFs) have gained popularity as investment vehicles over the decade spanning from 2003 to 2013 (Fuhr 2013). The increased popularity brings with it continuous innovation and increased sophistication in the product offerings.¹ Traditionally, ETFs have been structured in such a way as to track the returns of a specific index or benchmark (*inter alia*, ETFs historically delivered the beta or market average). However, recent developments in the ETF market offers even more options to investors, and alternative ways in which the ETF index can be structured are emerging (Stevenson 2012). ETFs offer increasingly sophisticated ways to gain exposure to the market and provide a cost-effective way to restructure a portfolio by gaining access to a diverse variety of market segments. Initially, ETFs have been considered only as passively managed investments, and hence, there has always been the need to combine these investments with other kinds of investment vehicles in a portfolio.² As ETFs develop, the basic structure of merely tracking a market capitalisation-weighted index is being replaced by more complex methods of indexing. More advanced approaches are challenging the conventional passively managed ETFs by adding a degree of activeness to the index composition (Chow *et al.* 2011). Traditional market capitalisation-weighted ETFs, by means of allocating the weights in the fund according to the market capitalisation of each security, will only offer positive returns to an investor when securities with greater market capitalisation exhibit positive returns.³ Therefore, during economic slowdowns or recessions, these investments may lose value. As such, conventional ETFs historically needed to be complimented with other investment products or asset classes to eliminate the systematic risk of the market. With the development of fundamentally weighted ETF indexation, equally weighted ETF indexation and leveraged ETFs, the aim is to add portfolio exposure beyond the single market factor (Fama 2000). These products do not merely track the market but have the ability to outperform the market index (Arnott, Hsu & Moore 2005; Plyakha,

1. Amenc, Goltz and Martellini (2013), Hsu (2014), Hsu and Kalesnik (2014) and Siracusano (2014) have provided research on the innovation in ETF industry with the development of the smart-beta ETFs. Furthermore, a growing number of wealth managers (such as Betterment and Wealthfront) are utilising increasingly sophisticated algorithmic portfolio construction strategies (so-called Robo advisor services) to build customized ETF portfolios for customers pointing to further enhancements in the ETF industry.

2. The core satellite approach is one such strategy and focusses on holding a selection of passively managed funds at the core of a portfolio. The desired market outperformance (alpha) in the portfolio is then achieved by selecting strategic actively managed funds/instruments as 'satellite' holdings in the portfolio (Waring & Siegel 2003).

3. Market capitalisation indexation creates a similar effect to a momentum strategy as over longer time periods securities that have increased in price the most relative to other securities in the index will carry the greatest weight. This weighting method leads to overweighting stocks that have risen in price (and may be overvalued) and underweighting stocks that have declined in price (and may be undervalued) (Hsu 2006).

Uppal & Vilkov 2012). The more sophisticated ETF indexation methods claim to offer additional returns to investors in excess of that which can be achieved with conventional ETFs by tilting the portfolio weights in favour of factors other than the market beta. This research is aimed at testing this claim by considering not only the absolute returns of the various indexation methods, but also by incorporating risk adjustments, a risk-adjusted performance evaluation can be conducted.

The absence of such a cross-category analysis within the South African (SA) market prompted this research to be conducted. SA ETF performance measurements were supplemented with performance measurements of United States (US)-traded ETFs to allow for the inclusion of leveraged ETFs into the comparison. Various risk-adjusted performance measures were calculated for each ETF indexation category and compared to similar metrics of ETFs in the other categories. The selected risk-adjusted performance measures provide a view of the risk–return characteristics of each ETF category by incorporating the amount of risk that has to be incurred to achieve the level of return (Bacon 2004). For the purposes of the study, six performance measures were used to rank the risk-adjusted performance of ETFs. The Sharpe, Treynor, Sortino, Calmar, Information and Omega ratio were all used to evaluate the ways in which the ETF indexation methods compared with each other.

Literature review

Market capitalisation–weighted (traditional) indexation

The market capitalisation (market cap)-weighted method for index construction assigns a weight to each security in the index relative to the size of the company as measured by its market capitalisation. Traditionally, the idea to base passive investment funds on a market cap-based index followed from the efficient market hypothesis (EMH), as it reflected the underlying notion that the market price of the company will be representative of all the information currently available for that particular company. According to this methodology, the market cap is believed to be a reasonable representation of the true fair value⁴ of each company comprising the index. However, the existence of an efficient market is questionable, and some studies have subsequently proposed that alternative indexation strategies are preferable (Siegel 1994).

Choueifaty and Coignard (2008) and Hsu (2006) state that there are increased claims that the market capitalisation-weighted indices are not an efficient way to obtain optimal risk-adjusted returns. Studies have proven that the high concentration of the market capitalisation indices towards specific sectors create a bias towards highly correlated stocks, which do not provide ideal levels of diversification (Stevenson 2012:59). Mean–variance diversification can only be achieved when low or negatively correlated securities are

added into the portfolio, which might not be the case for a sector ETF containing highly correlated stocks.

Market cap indices, furthermore, have the characteristic that these indices (by design) are heavily weighted towards the large cap stocks in the market (Clare, Motson & Thomas 2013). An added benefit of market cap indices that follows closely with this characteristic is the high liquidity associated with large (and frequently traded) stocks (Arnott *et al.* 2005). The bias towards large stocks has the disadvantage that stocks with higher market prices (*inter alia* popular stocks) are given a greater weight in the index. The market cap indexation method can be said to be flawed as it overweighs expensive companies (Arnott *et al.* 2005; Hsu 2006). By definition, companies that are overvalued will have an extra weight in the index at the expense of undervalued companies (Hsu & Campollo 2006).

The construction of the index using the market cap indexation technique creates a momentum bias. As popular stocks increase in value at a relatively fast rate, the share price and subsequently the market value will increase. A passive fund manager with an index tracker based on market cap will, as a result, have to increase the weightings of ‘hot stocks’ on a continuous basis (Stevenson 2012). As a negative consequence, an investor is always invested largely in the sectors that are popular and conversely have reduced exposure to the unpopular sectors, regardless of the valuations of the sectors. The momentum bias of market cap indices was proven during the extended bull run of the markets in the 1990s, when the market cap-based index method outperformed all the other indexation methodologies (Clare *et al.* 2013). In reaction to the drawbacks of the traditional indexation methodology, a few alternatives were developed. Fundamentally weighted indexing represents one such substitute method.

Fundamentally weighted indexation

In order to overcome the bias of the market cap-weighted index towards the more popular stock in the market, an alternative indexation method was developed. The fundamentally weighted indices assign larger weightings to stocks that are expected to offer the best value in terms of a set of selected fundamental characteristics, rather than using the market value of stocks as the selection criteria. It can also be said that fundamental indexation aims to deliver not only beta (market risk) but instead provide an alternative or smart beta (Chow *et al.* 2011). Fundamentals of companies form the selection criteria, which are used in the construction of a fundamentally weighted index. Variables such as the book value, revenues (cash flows), gross sales, dividends and employment are some of the factors that are considered the drivers of the future expectations for returns. The fundamentally weighted methodology seeks to create a value bias, which can produce extra returns over a long time frame by including securities that display favourable fundamental ratios (Stevenson 2012).

According to Fama (2000), the single risk factor (beta) that is used by the market cap methodology cannot be considered

4. The true fair value of a company should be based on the discounted future cash flows expected from the company (Arnott *et al.* 2005).

the only source of risk for all stocks. A three-factor risk model that includes the size of the company, book-to-market value, as well as the market index, was proposed by Fama and French (1996). Small company stocks expose an investor to a different form of volatility and exhibit unique risk–return characteristics when compared to larger sized companies. ‘In the presence of more than one risk factor, the goal of indexing switches from diversification across the available stocks to diversification across the available risk–return dimensions’ (Fama 2000:2). Constructing an index based on fundamentals holds a particular challenge when trying to retain the advantages of the market cap methodology. The two main advantages of market cap weightings, liquidity and low turnover, must be compared to fundamentally weighted indices. Firstly, the increased market value of large capitalised stocks provides an inherent liquidity benefit. Smaller stocks with favourable fundamentals might not necessarily be as liquid. Arnott *et al.* (2005) found that a strong correlation exists between liquidity and other company fundamentals such as book value, cash flow, sales, revenue and dividends. Subsequently, liquidity is not compromised because of fundamental indexing, because the size of the firm is in a large part determined by these fundamental variables.

Secondly, fundamental indexation cannot provide the same low-turnover⁵ benefits as market cap–weighted indices. Fundamental indices do have higher turnovers and need to be rebalanced on an annual basis to reassign weights according to changes in fundamental valuations (Arnott *et al.* 2005). Davies (2012) states that the danger with this technique is that, the data can become very stale as the annual rebalancing approaches. Rebalancing of fundamental indices only occurs on an annual basis because of frequency of the available annual reports from the companies. Arnott *et al.* (2005) oppose Davies’ view and found no meaningful return advantage when rebalancing of the fundamental indices was carried out on a more frequent basis. Higher turnovers than market cap indices are however noticeable.

Arguments both for and against the use of fundamental indexation have been put forward by critics. On the downside, the fundamental indices tend to under-represent fast-growing or young companies relative to their weighting on traditional indices. Fundamental valuations of such companies might not be in line with current market pricing. The negative effects of this bias towards fundamental value instead of market value are the missed opportunities of capturing sudden upward movements in the market. Hsu and Campollo (2006) confirm that fundamental indices will underperform relative to other methodologies in a bubble environment when rapid and irrational expansions in market prices provide better results for large market-capitalised companies. The momentum bias of market cap–weighted indices is apparent in markets with extreme momentum, which will hurt the performance of fundamental indexation (Hsu & Campollo 2006).

5. The low turnover in market cap–weighted indices is a result of the slow change in the rankings of the largest companies in the market. Very little movement in these rankings results in fewer rebalances of the index.

Fundamental indexation also provides the opportunity to gain returns above that shown by the traditional indexation method. Arnott *et al.* (2005) state that the fundamental (non-capitalisation-based) indices consistently provide higher returns than the traditional cap-weighted equity market indices. The explanation for superior returns from fundamental indexation can be found in the validity of the EMH. In an inefficient market, the market cap–weighted indices will experience a return drag as rebalancing occurs at a slower rate, providing a better opportunity for a fundamental index. However, in an efficient market, an investor will be indifferent in regard to selecting a specific risky portfolio, and as such, the fundamental index will perform on par with the market cap–weighted index (Hsu & Campollo 2006).

It has also been suggested that a portfolio should, if the market is efficient, be ‘mean-variance efficient’, but there is no reason why this should be the case on an *ex ante*⁶ basis (Clare *et al.* 2013). Arnott *et al.* (2005:97) concur by stating that ‘The fundamental indices are materially more mean-variance efficient than standard cap weighted indices’. It can be said that fundamental indexation is a viable alternative to the traditional market cap–weighted indices. The equally weighted index method is another alternative indexation method.

Equally weighted indexation

Equally weighted indices assign the same weight to each of the *n* stocks comprising the index. Unlike market cap and fundamental indexation methodologies, no bias is created towards any stocks in the index, as each carries an identical weight. The construction methodology followed by equally weighted indices creates unique characteristics, which are different from the underlying headline indices. Concentration risk that might arise with the market cap approach will not be present in equally weighted indices, as larger sectors are not over-represented by this methodology (Zeng & Luo 2013).

Three drawbacks of equally weighted indices can be identified when compared to traditional market cap indices. Firstly, equally weighted indices will have reduced liquidity because of the larger proportion of the index that comprises smaller (and possibly less traded) stocks. When the fund rebalances and acquisitions of smaller stocks are required, a lack of supply in the market could affect the ultimate weightings. Secondly, an equally weighted index will not provide the return characteristics that are representative of the aggregate equity market (Arnott *et al.* 2005). Greater allocation towards smaller stocks in the market will deliver significantly altered returns, as opposed to those of the traditional market cap indices. A final drawback can be found in the higher turnover rate of equally weighted indices (Zeng & Luo 2013). This is the result of a quarterly rebalance schedule, followed by equally weighted indices.

Despite the theoretical limitations of equally weighted indices, it has been shown empirically that equally weighted indices

6. *Ex ante* refers to the detection of an outcome before the event occurrence.

have outperformed market cap-weighted indices over longer periods (Plyakha *et al.* 2012; Zeng & Luo 2013). However, these results have varied considerably over different market conditions. Burgess (cited by Stevenson 2012:59) states 'in bull markets, the equal weight index does seem to produce better returns than the standard index, if only because of its relative weight towards smaller stock'. Fernholz and Shay (1982) also found that an equally weighted portfolio has the potential to earn returns that are greater than buy-and-hold portfolios.⁷ Outperformance of equally weighted indices over traditional market cap indices is clearly visible, given the correct market conditions. Differing weightings and rebalancing practices can be seen to be the major contributors to such outperformances.

Leveraged indexation

Leveraged ETFs are linked largely to an underlying market cap-weighted index. However, instead of seeking to mimic the exact return of the underlying index, leveraged ETFs will aim to deliver a multiple of the index value. An inverse ETF ties in closely with leveraged ETFs as it seeks to deliver a negative multiple of the index. The leveraged factor, which leveraged ETFs aim to deliver, ranges from two times (2×) or three times (3×) the index (for a long position on the market), to negative two times (-2×) or negative three times (-3×) the index (for a short position on the market) (Stevenson 2012:128). Leveraged ETFs can be considered as a magnified variation on the market cap-weighted index. Any increases in the market cap-weighted indices will result in an amplified increase in the leveraged ETF.

A critical area to note is that most leveraged ETFs in existence are daily leveraged ETFs (Johnston 2010). Daily leveraged ETFs as such seek to deliver the stated leveraged factor on a daily basis. The compound returns of daily leveraged ETFs will, over a longer time period, differ significantly from expected levels.⁸ Daily leveraged ETFs are by design structured to deliver superior returns to that of the market on a daily basis. However, longer term results of such products will deviate from the underlying market index, depending on the volatility of the market index. Leveraged ETFs have the requirement that both the direction and magnitude of market movements be predicted correctly in order to gain over the longer term (Johnston 2010).

Very little literature (and in the case of SA none at all)⁹ exists that compares the performance of a leveraged indexation approach to others, such as fundamentally weighted and equally weighted on a risk-adjusted basis. The study seeks to fill precisely this gap.

Research methodology

Data

Data collection for the study was limited to selected equity ETFs in SA and the US. Equity funds were selected over bond or commodity funds because the largest part of the

7. Buy-and-hold strategies are in most cases synonymous with traditional passive investing, which is associated with market cap-weighted indices.

8. The compounded value of the leveraged ETF is expected mistakenly to be the underlying index value multiplied by the leveraged factor.

9. This is a result of the regulation prohibiting leveraged ETFs in the SA market.

ETF market comprises equity ETFs. Equity ETFs provided the benefit that a comparable market index could be used as a benchmark in which to relate return performance. For the SA market, the JSE Top 40 index was selected as the market index, whereas in the US, the S&P 500 index served as a similar benchmark index. The US was selected as the country of comparison because of the vast amount of ETFs traded in the US market and because it is the birthplace of the ETF product.

Returns for all the above-mentioned ETF categories were calculated from the ETFs' daily closing prices. The creation and redemption whereby new ETF shares are created or eliminated reduces any arbitrage between the NAV and market prices for an ETF. As a result, the market prices of ETFs will not differ dramatically from the net value of the underlying assets (Pennathur, Delcours & Anderson 2002), hence the decision to use market prices instead of the NAV for each ETF. Market prices for SA ETFs were obtained from the McGregor BFA Expert (2014) database, whilst the Yahoo Finance (2014) database provided the historical prices for US ETFs. The risk-free rate of return (as used in many performance measures) was based on the 91-day Treasury bill rates for SA and the US. Risk-free rates were obtained for the same observation period as the price data. SA treasury rates were obtained from the South African Reserve Bank (SARB 2014), whilst US treasury rates were obtained from the Board of Governors of the Federal Reserve System's (2014) website.

Traditional market capitalisation ETFs were selected from funds that aim to replicate the performance of these benchmark indices as closely as possible. For both the SA and US market, three traditional market capitalisation ETFs were selected. For SA, this was the complete list of ETFs available in the market, which aim to replicate the JSE Top 40 index. The same sample size from the US ensured consistency in comparisons. The selection of fundamentally weighted ETFs in SA was based on the availability of historical data. Only two SA equity ETFs, with a close relation to the benchmark index, fulfilled the criteria for sufficient historical information. A similar sample size was selected for the US market. Only one equally weighted ETF is traded in the SA market, and subsequently, one equally weighted ETF was selected from the US market. Because of the regulations imposed on the SA ETF industry, no leveraged ETFs are in existence in the SA market. A comparison of the three above-mentioned indexation methods to leveraged ETFs was as a result restricted to the US ETF market. Both leveraged and inverse ETFs were included as part of the analysis. One two-times and one three-time leveraged ETF was selected. Similarly, one negative two-times and one negative three-time inverse (short) leveraged ETF was included into the analysis. To allow as many ETFs to be analysed as possible, a period from December 2010 to January 2014 was selected. The restrictive sample and period under consideration limits the generalisability of the findings to only an upward trending market and the four indexation methods under review.

Risk-adjusted performance measures

The study follows industry best practice and conducts the return performance analysis of the various ETFs using an array of risk-adjusted performance measures. The six performance measures used as part of the study differ primarily with the adjustment for risk (Mayo 2000:249). The Sharpe ratio considers total risk; the Treynor ratio considers only the systematic risk; the Sortino ratio accounts for the downside risk below a specified threshold rate; the Calmar ratio considers risk as the maximum downturn that an investment exhibited; and the Information ratio incorporates the tracking error as its risk measurement. A detailed examination of each measure is provided to emphasise the importance of its use in the study.

Various characteristics of each of these measurements validated its use in the study. In addition, however, some shortcomings with each of the above-mentioned measurements created the need for results to be compared to other measures of portfolio performance. The total risk¹⁰ measurement used by the Sharpe ratio ensured that less diversified ETFs could be evaluated (Le Sourd 2007). However, the use of the standard deviation of returns as risk measure essentially penalises upside variation in the return series (De Wet, Krige & Smit 2008). The Sharpe ratio relies on the assumption that returns are normally distributed (Eling & Schuhmacher 2007:2633), which is not the case for our sample of ETFs. The Treynor ratio can be considered a closely related portfolio performance ratio, which uses the beta of the portfolio as the risk measurement (Bacon 2004).

Both the Sortino and Calmar ratios hold the benefit that upside risk is not penalised, as risk measurements are incorporated differently into each of these ratios. The use of downside risk in the Sortino ratio ensures that a specified minimum level of return could be selected to determine the deviation of returns away from such a level. The Sortino ratio allows for a user-defined minimum level of return to be set which, if chosen incorrectly, could over- or understate the downside risk (Amenc *et al.* 2004:21). Because of the use of daily data for the study, the minimum level of return was set at zero. The limited data for the study allowed for only a three-year bull market to be included. As such, no extreme downturns were observed in the period under review. However, incorporating the Calmar ratio into the analysis provided some manner to observe the performance of each ETF in reaction to its most extreme event (maximum downturn).

The Information ratio holds particular importance for its application to ETF performance measurement. The use of the tracking error as the risk measurement is of great importance with passively managed investment products such as ETFs. The inclusion of the tracking error in the calculation of the information ratio provided a good comparison of how well each ETF performed relative to the benchmark market index. The information ratio as a

10. Measured by the standard deviation of returns.

technique to evaluate the performance of various indexation methodologies has also been applied in numerous other studies (Arnott *et al.* 2005, 2010).

Eling and Schuhmacher (2007:2633) stated that a primary argument for the selection of a performance measure rests on the fund's return distribution. Investment funds exhibiting non-normal return distributions cannot be evaluated sufficiently with the use of performance ratios such as the Sharpe and Treynor ratios (Sharma 2004). The use of only the first two moments¹¹ of the return distribution in the Sharpe and Treynor measurements can provide inconsistent results when returns are not normally distributed. The Sortino ratio improves on this drawback of the Sharpe and Treynor measures by allowing asymmetrical return to be evaluated (Kanellakos 2005:76). Utilising downside risk allows for the skewness¹² of the distribution to be incorporated into the calculation (Amenc *et al.* 2004:21). Similarly, the Calmar ratio is not only concerned with the mean and variance but also applies to the maximum downturn experienced over the period under review. However, the Calmar and Sortino ratios only consider the lower partial moments, which reflects upside and downside variability differently.

The final performance measure, the Omega ratio, overcomes all the limitations experienced by the other performance measures. The Omega ratio incorporates all four moments of the distribution of returns; *inter alia* the mean, variance, skewness and kurtosis (Togher & Barsbay 2007). The Omega performance measure considers both the upside potential (higher partial moments) and the downside potential (lower partial moments) of a portfolio for the entire distribution of return (Kazemi, Schneeweis & Gupta 2003). By using the entire cumulative distribution function, the Omega ratio needs to make no assumptions about the shape of the distributions (Keating & Shadwick 2002). Subsequently, fund rankings obtained using the Omega ratio will be noticeably different from those obtained by other performance measures. Keating and Shadwick (2002) state that when the higher moments of the distribution are important,¹³ the Omega will provide a correction for the simplifying assumptions made in other performance measures. The Omega also differs from other measures of performance as the ratio is expressed as gains to losses, rather than in the form of (expected) return and risk (Van Dyk, Van Vuuren & Styger 2012). Botha (2006:1) summarises the supremacy of the Omega ratio by stating that the Omega is superior to both the Sharpe and Sortino ratio.

The above-mentioned comparison between the different performance measures highlights the importance of each ratio as part of the overall analysis. The Omega ratio exhibits some distinct characteristics, and subsequently, the findings obtained with the use of the Omega ratio will carry a greater weighting in the conclusion.

11. The mean and variance.

12. Skewness can be considered as the third moment of the distribution.

13. The importance of the higher moments is dependent upon the existence of normality in the return distribution.

Findings and discussion

Distribution statistics

The return distribution characteristics for the ETFs included in the study are presented in Tables 1 (South Africa) and 2 (United States). It is important to evaluate the descriptive statistics associated with each ETF and the market index to determine to what extent the return distributions compare with a normal distribution.

The negative skewness and high kurtosis values will cause any performance measures that rely heavily on the first two moments of the distribution to misrepresent the overall level of risk. Traditional performance measures such as the Sharpe ratio and Treynor ratio, therefore, need to be interpreted with caution. Results obtained by performance ratios (such as the Omega) that do incorporate higher order moments will deliver more consistent rankings (Eling & Schuhmacher 2007:2633). The descriptive statistics for the data set reveal that the assumption of normality does not hold for the period under review and as such requires a metric that incorporates the higher order moments of the distribution. The Omega

ratio was identified as the superior ratio in this regard as it contains the ability to deliver consistent ranking results at various levels of a return threshold.

Performance measurement

Table 3 and Table 4 provide a summary of the performance measurement ranking obtained from the selected ETFs during the period under review. The Sharpe ratio analysis provided a means to compare the ETF indexation methodologies on a risk-adjusted basis. The use of standard deviation as the risk measure delivered results that incorporated total risk into the computation. For the SA sample, it was indicated that the rankings of the Sharpe ratios were consistent with the absolute return rankings. Fundamentally weighted ETFs were dominant, whilst the equally weighted ETF ranked poorly. For the US sample, the risk-adjusted rankings of the Sharpe ratio differed considerably from the absolute return rankings, which indicated that the equally weighted ETF was most affected by the risk adjustment. The leveraged ETF category revealed risky characteristics and significantly poor risk-adjusted rankings.

TABLE 1: Descriptive statistics for SA market ETFs.

Market	Mean	Median	Maximum	Minimum	Standard. deviation	Skewness	Excess kurtosis
JSE Top 40 Index	0.0006	0.0010	0.0414	-0.0338	0.0104	-0.1541	1.2421
ETF U	0.0006	0.0010	0.0416	-0.0341	0.0105	-0.1662	1.2491
ETF V	0.0006	0.0013	0.0387	-0.0385	0.0107	-0.2383	1.0594
ETF W	0.0006	0.0000	0.2454	-0.1846	0.0178	1.8515	76.2768
ETF X	0.0006	0.0012	0.0471	-0.0481	0.0096	-0.1833	2.0936
ETF Y	0.0006	0.0012	0.0349	-0.0326	0.0105	-0.0510	0.6980
ETF Z	0.0004	0.0000	0.0991	-0.1119	0.0139	-0.3860	14.8989

Source: Compiled by the authors

TABLE 2: Descriptive statistics for US market ETFs.

Market	Mean	Median	Maximum	Minimum	Standard deviation	Skewness	Excess kurtosis
S&P 500 Index	0.0005	0.0007	0.0474	-0.0666	0.0103	-0.4768	5.2160
ETF A	0.0006	0.0008	0.0465	-0.0652	0.0102	-0.5000	4.9624
ETF B	0.0006	0.0009	0.0448	-0.0641	0.0102	-0.4710	4.6956
ETF C	0.0006	0.0009	0.0516	-0.0648	0.0103	-0.4742	5.3082
ETF D	0.0006	0.0013	0.0507	-0.0709	0.0105	-0.5241	5.3333
ETF E	0.0006	0.0010	0.0513	-0.0732	0.0114	-0.5021	5.0418
ETF F	0.0006	0.0008	0.0364	-0.0553	0.0094	-0.5087	3.8237
ETF G	0.0011	0.0015	0.0934	-0.1287	0.0205	-0.4973	5.0574
ETF H	-0.0012	-0.0016	0.1290	-0.0948	0.0205	0.4718	5.0142
ETF I	0.0017	0.0025	0.1430	-0.1970	0.0310	-0.5027	5.1318
ETF J	-0.0019	-0.0027	0.2021	-0.1507	0.0311	0.5109	5.3641


Source: Compiled by the authors

TABLE 3: SA ETFs – Overall summary.

Ranking key	Best ➔ Worst						
Annual compound returns	Fundamental	Fundamental	Index	Market cap	Market cap	Market cap	Equal
Sharpe	Fundamental	Fundamental	Index	Market cap	Market cap	Market cap	Equal
Treynor	Market cap	Fundamental	Fundamental	Market cap	Index	Market cap	Equal
Calmar	Index	Fundamental	Market cap	Fundamental	Market cap	Market cap	Equal
Sortino	Fundamental	Fundamental	Index	Market cap	Market cap	Equal	Market cap
Information	Fundamental	Fundamental	Market cap	Market cap	Market cap	Equal	
Omega (+RFR threshold)	Fundamental	Index	Market cap	Market cap	Fundamental	Market cap	Equal
Omega (-RFR threshold)	Index	Market cap	Market cap	Market cap	Fundamental	Fundamental	Equal

Source: Compiled by the authors

TABLE 4: US ETFs—Overall summary.

Ranking key	Best 										Worst	
Annual compound returns	3× Long leveraged	2× Long leveraged	Equal	Market cap	Market cap	Market cap	Fundamental	Fundamental	Index	-2× Short leveraged	-3× Short leveraged	
Sharpe	Fundamental	Market cap	Market cap	Market cap	Fundamental	Equal	2× Long leveraged	Index	3× Long leveraged	-3× Short leveraged	-2× Short leveraged	
Treynor	Fundamental	-2× Short leveraged	-3× Short leveraged	Market cap	Market cap	Market cap	Fundamental	Equal	2× Long leveraged	Index	3× Long leveraged	
Calmar	3× Long leveraged	Fundamental	Market cap	Market cap	Equal	Fundamental	Market cap	2× Long leveraged	Index	-3× Short leveraged	-2× Short leveraged	
Sortino	Fundamental	Market cap	Market cap	Market cap	Fundamental	Equal	Index	2× Long leveraged	3× Long leveraged	-3× Short leveraged	-2× Short leveraged	
Information (index excluded)	2× Long leveraged	3× Long leveraged	Market cap	Market cap	Market cap	Equal	Fundamental	Fundamental	-3× Short leveraged	-2× Short leveraged	-	
Omega (+RFR threshold)	3× Long leveraged	2× Long leveraged	Market cap	Market cap	Market cap	Index	Equal	Fundamental	Fundamental	-3× Short leveraged	-2× Short leveraged	
Omega (-RFR threshold)	Market cap	Market cap	Market cap	Index	Fundamental	Fundamental	Equal	2× Long leveraged	3× Long leveraged	-2× Short leveraged	-3× Short leveraged	

Source: Compiled by the authors

The Treynor ratio analysis incorporated beta as the risk measurement. The analysis of the ETF indexation categories on the basis of their systematic risk characteristics proved to deliver alternate rankings. The SA sample highlighted the importance of beta values, as market cap-weighted ETFs ranked better when compared with the Sharpe rankings. A noticeable difference between the Treynor and Sharpe rankings exemplified the existence of higher levels of unsystematic risk in alternatively indexed ETFs. Inverse leveraged ETFs provided misleading results during the US Treynor analysis. The negative beta values and negative excess returns of this category skewed results in favour of inverse leveraged ETFs. However, the close similarity between the Treynor and Sharpe rankings was a noticeable observation in the US sample. The improved diversification within the US sample, as indicated by this finding, could have resulted from the relatively large number of underlying securities included in the US ETF index.

The Sortino rankings obtained from the SA sample showed inconsistent results to the Sharpe and Treynor rankings. In general, fundamentally weighted ETFs proved to outperform relative to other ETF categories, with some noticeable outliers observed for the market cap-weighted category. The downside risk measure used during the Sortino analysis penalised those ETFs that showcased a severely skewed data distribution. The significantly skewed distributions of leveraged ETFs in the US sample subsequently were affected greatly as these ETFs delivered poor Sortino rankings. The inclusion of the Calmar ratio in the study allowed for a measure to capture the extreme downturn of the ETF returns. The examination of a predominant bull market phase of the economy in the study, however, nullified the true benefit of the Calmar ratio. The Calmar ratio rankings for both the US and SA market provided mixed results, with no clear ranking of ETF categories.

The importance of tracking errors led to the inclusion of the Information ratio into the performance evaluation. Comparisons in the SA ETF market showed that fundamentally weighted ETFs performed better when compared to alternative

indexation methodologies. The US sample showed contrasting results as market cap-weighted ETFs outperformed when analysing the Information ratios. The importance of the number of securities in the underlying index, the beta values of the ETFs and the impact these factors have on the tracking errors were combined factors that create such differences between the various samples. Leveraged ETFs, as measured in the US sample, delivered good ranking results after adjusting tracking errors for the leveraged factor.

The Omega ratio was the decisive performance ratio for the study, as it exhibited unique characteristics that allowed the incorporation of higher order moments of the return distributions. The Omega ratio was considered at both a positive (positive value of the risk-free rate) and negative (negative value of the risk-free rate) threshold level. The separation between the threshold levels was made to illustrate the change in rankings that resulted from the respective threshold levels. Fundamentally weighted ETFs were shown to possess the ability to deliver an outperformance of alternatively indexed ETFs when returns were positive, as was indicated by the positive threshold level in the SA sample. Similarly, the US sample illustrated that leveraged ETFs, with the support of the significant benefits that they hold, could deliver substantial outperformance when returns were positive.

The negative Omega threshold analysis provided the most significant finding of the study. Analysis of a negative threshold level allowed for the riskiness of each ETF category to be evaluated. Rankings obtained from the negative Omega threshold analysis delivered significantly altered rankings compared to other performance measures. In the SA sample, the market cap-weighted ETFs dominated and proved to be the preferred ETF indexation category when considering negative returns. The US sample delivered similar results and also proved the market cap-weighted ETFs to be superior. Leveraged ETFs performed poorly when analysed on a negative return threshold basis. The high number of negative returns in the data series of leveraged ETFs had a severe impact on the rankings of both long- and short-leveraged ETFs.

Conclusion

Based on the risk-adjusted performance measurements in the study, the following key conclusions can be made. Fundamentally weighted ETFs can be seen to be performing better when analysed with standard performance measures that do not incorporate the distribution characteristics of returns. During a market upswing, measures such as the Sharpe ratio, Treynor ratio, Sortino ratio and Calmar ratio, which do not incorporate all moments of the distribution function, can show preferential results for fundamentally weighted ETFs. The Omega ratio holds the ability to capture higher order moments for the distribution of returns. This conveys alternative rankings of the indexation categories, particularly when analysed at a negative threshold level. Market cap-weighted ETFs can be said to hold lower levels of risk than all other ETF categories when measured by a negative Omega threshold. Leveraged ETFs hold the capacity to deliver substantial returns, but significant risks are linked to improved returns. A strong upward trending market does not present favourable conditions for the performance of equally weighted ETFs, in comparison to alternatively indexed ETFs.

Future research could include a comparison of ETF diversification with a measurement such as the principal component analysis, which is not dependent on the existence of a true market portfolio. The data frequency and observation period are other noteworthy areas of future improvement for the study. With restricted historical data availability for some fundamentally weighted ETFs, the study was reduced to the most recent three-year period. Extension of the time period would allow for analysis beyond that of an ordinary bull market phase. Inclusion of data from multiple countries could further enhance the robustness of the findings. However, in the present moment, in consideration of the available time frame and data, the study proved successful in its findings. At the time of writing, two new fundamentally weighted ETFs were being launched into the SA market, which indicated the continuous innovation in the SA ETF market. The study, however, highlights that such developments bring with it unique risks that justify thoughtful adoption of alternative ETFs into a portfolio.

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Competing interests

The authors declare that they have no financial or personal relationship(s) that may have inappropriately influenced them in writing this article.

Authors' contributions

W.P. (North-West University) and A.M. (North-West University) contributed equally to the writing of this article.

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Evaluating knowledge management implementation in an organisation: A case study in the context of Eskom's HyperWave

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In this paper, the interpretive philosophy was adopted and drawn from structuration theory's (ST) concept of enactment of technology-in-practice (ETiP). ETiP was used as a lens to understand and interpret factors influencing the implementation of knowledge management (KM) in an organisation where knowledge transfer/sharing is critical to its operational efficiency. Eskom, a power utility organisation in South Africa was used as the case study and the HyperWave KM system implementation was used as the object of analysis. The study's rationale was that at all levels of operations of an organisation the need to establish systems to manage the creation, capture, flow and delivery of knowledge and information is critical. The challenge is that such systems are often seen to clash with the corporate culture and as a result have a limited impact. The study investigated the challenges of implementing KM at Eskom. Using the concept of ETiP, a conceptual framework was developed, which guided the collection and analysis of data from questionnaires and existing documents that were verified by unstructured interviews. Forty-three respondents completed the research questionnaires and 15-minute semi-structured interviews were conducted with four individual participants. Questionnaires and interview questions were based on the KM improvement model regarding (1) measures of organisational support: (a) leadership, (b) incentive, (c) coworker, (d) supervisor and (e) organisational culture; (2) knowledge content quality; (3) KMS quality; and (4) perceived usefulness of knowledge sharing.

Introduction

Organisations, at all levels of operations, need to establish systems to manage the creation, capture, flow and delivery of knowledge and information. Furthermore, Wang and Lai (2014) alluded to this observation and argued that systems are being designed by many organisations to facilitate knowledge management (KM), the management of intellectual property and the development of sustainable competitive advantages. Knowledge management systems (KMS) are being implemented in an attempt to increase the quality and speed of knowledge creation and distribution in organisations. The problem is that such systems are often seen to clash with the corporate culture and as a result have a limited impact. Wang and Lai (2014) alluded to this and highlighted that this could be because the literature is still rather limited in terms of presenting a comprehensive picture of the issues related to KMS adoption in organisations. The paper aimed at exploring factors likely to influence the implementation of KM in an organisation where knowledge transfer/sharing is critical to its operational efficiency. The study investigated the challenges of implementing KM in an organisation using Eskom as a case study. The paper provides a summary of a research undertaken to tease out the research problem, highlighting the underpinning theory, literature review, research approach, interpretation of results and conclusion. According to Sabri (2014), knowledge is considered as one of the most important assets that achieves competitive advantage in the organisation. It is important that an organisation establishes systems to manage the creation, capture, flow and delivery of knowledge and information available amongst all levels of the organisation. The major challenge of managing knowledge is less its creation and more its capture and integration (Grant 1996).

Geisler and Wickramasinghe (2015) have alluded to this observation and argued that embracing KM and implementing any KM initiative are a very challenging endeavour, which could be divided into (1) getting employees on board, (2) having business goal, (3) not allowing technology to dictate KM, (4) identifying technology to support KM, (5) approaching to KM and (6) identifying who is to lead KM efforts. According to Coakes (2004), it is now realised that KM is not a technology-driven 'fix'. KM begins with the social and cultural elements throughout an organisation. A KM strategy should begin with establishing 'who', 'what' and 'why', and the 'How' can then be supported by using technology. The following activities were identified by Award and Ghaziri (2003) in relation to what is expected of the management to support

KM in an organisation: economics and strategic planning; training; compensation and reward; and performance appraisal. Akhavan *et al.* (2010) identified eight factors that were common in successful KM projects. These factors were senior management support; clearly communicated KMS purpose/goals; linkages to economic performance; multiple channels for knowledge transfer; motivational incentives for KM users; a knowledge-friendly culture; a solid technical and organisational infrastructure; and a standard, flexible knowledge structure. Each organisation has its unique culture, which develops overtime to reflect the organisation's identity in two dimensions: visible and invisible. The visible dimension of culture is reflected in the espoused values, philosophy and mission of the firm, whilst the invisible dimension lies in the unspoken set of values that guide employees' actions and perceptions in the organisation (McDermott & O'Dell 2001).

Theoretical framework and research approach

Overview of structuration theory

The dimensions of duality of structure of Giddens' structuration theory (ST) were used to tease out the research problem. In its original formulation, ST pays little attention to technology (Jones 1999). According to Giddens (1986), one of the most important applications of ST to information system's research lies in the recognition of structure and agency as duality, which makes a clear distinction between structure and agency, yet recognising them as dependent on each other interactively. One of the problems of implementing KM is that it cannot be imposed on people and it can only be successful when people realise the benefits thereof. A proper change management programme that takes both the business and the people into account must be employed. In Table 1, social structure and human interaction are divided into three columns. Each structure and interaction is then associated with each other recursively via the linking modalities (interpretive scheme, facility and norm). Three forms of structure are given here, representing various embedded social realities: signification, domination and legitimation.

Walsham (2005) drew attention to three modalities of human agency/structure, namely interpretive schemes, norms and power relations. Furthermore, interpretive schemes

relate to how things are represented in communities and organisations. In the case of Eskom, the researcher looked at instances as employees communicate; they use interpretive schemes to help them make sense of their interaction; and at the same time these interactions change or reproduce the same interpretive schemes that are embedded in structures as signification. This paper looked at how HyperWave was presented to Eskom employees. A focus on interpretive schemes led to questions such as why particular forms of presentation were chosen in particular contexts, and what types of representation were perceived to be valuable by the individuals within particular communities. This led to the conceptualisation of the problem shown in Figure 1.

Deducing from the views of Walsham (2005), norms relate to what is normally represented and for whom, and this will answer the question why particular forms of representation were chosen. That is, how was HyperWave introduced to Eskom employees? In the same context, Walsham's (2005) power relations imply a focus on who requires particular representations and for what purposes. ST assisted in understanding and interpreting the effect of people in power, in this case group IT project managers and managers from the business. Thus, how Eskom managers view and support KM in an organisation can have an effect on obtaining the required results when implementing the system, looking at the decisions made and what informed them and what role did they play in KMS implementation. ST has been used successfully by Walsham (2005) in a compound UK case study from where the theoretical schema shown was developed, and the questions generated through the use of ST were illustrated through their application

The case

Eskom is a South African electrical power utility, which has over 40 000 employees. With so many employees, one could imagine how much knowledge is carried by those employees and how much knowledge is shared between them. Eskom employees in different business units and levels interact with customers, suppliers, contractors, tertiary institutions, government departments, shareholders, regulators and other stakeholders on a daily basis to carryout various tasks. The interaction and collaboration with such external parties is a common practice throughout Eskom and essential as a 'state' and 'public' enterprise. With Eskom embarking on projects of building new power stations, retired employees had to be called back to assist as certain skills and knowledge were required from them. It is believed that if they had working KM processes in place this could have been avoided. Eskom KM policy is to help Eskom to manage its knowledge in such a manner that it would enhance the achievement of the business priorities through optimisation and delivery of knowledge in the organisation. The policy is to ensure that the implementation of an effective and efficient KM programme to maximise the benefit of (1) human capital management: tacit knowledge (experience) of experts in the organisation is an important catalyst to mitigate Eskom's

TABLE 1: The dimensions of the duality of structure

	Signification	Domination	Legitimation
Modality	Interpretive scheme	Facility	Norm
Interaction	Communication	Power	Sanction
	Structure(s)	System(s)	Structuration
	Rules and resources, or set of transformation relationships, organised as properties of social systems	Reproduced relations between actors or collectiveness, organised as regular social practices	Conditions governing the continuity or transmutation of structures, and therefore the reproduction of social systems

Source: Giddens, A., 1986, *The constitution of society: Outline of the theory structure*, University of California Press, Bekerly.

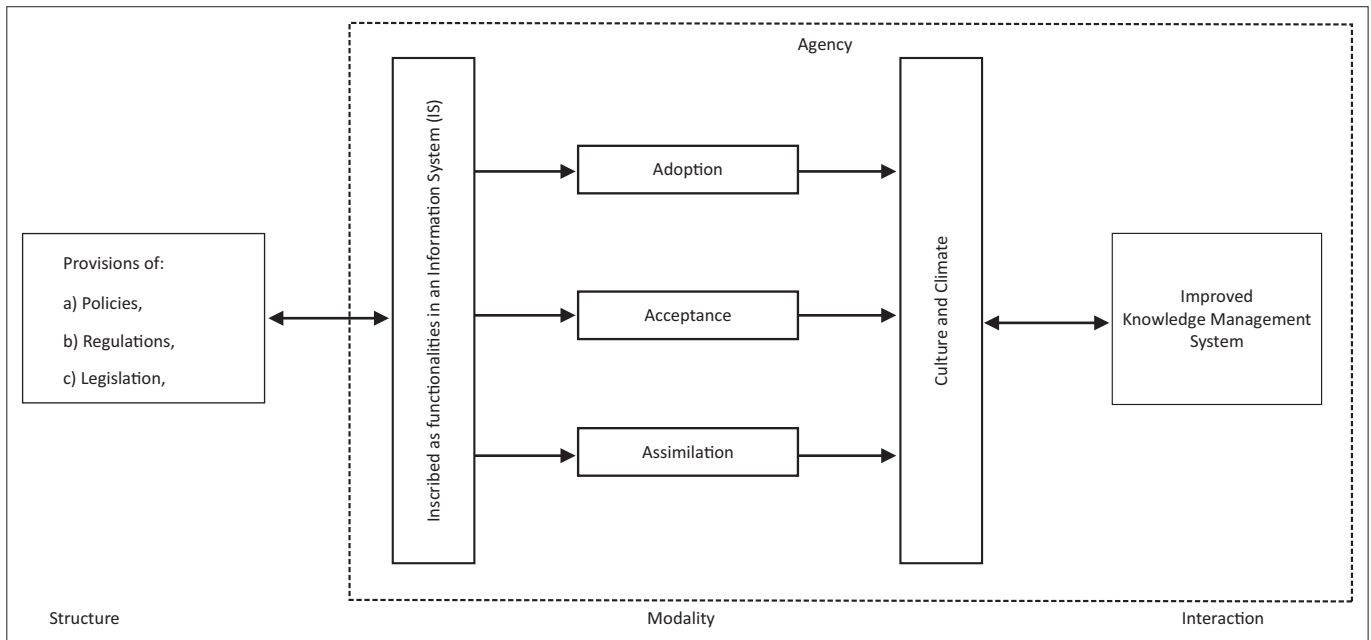


FIGURE 1: Problem conceptualisation.

escalating intellectual property risk; (2) learning and growth: learning, training, development and succession planning are crucial to Eskom if the imperatives of Eyethu are to be realised; (3) collaboration and knowledge sharing: to achieve the objectives of the Revised Business Model, Eskom needs to rapidly and effectively learn from its experiences. The value chain adopted in Eskom consists of three parts: (1) collection of the intellectual capital that focus on capturing and converting tacit knowledge into documents and records (e.g. lessons learnt); (2) transformation that looks at security, classification and change management with the focus of getting people to collaborate and to share knowledge in the organisation; and (3) monitor and control processes to manage and ensure that the aforementioned (i.e. the first two parts) are being taken care. To enable collaboration and sharing of information in Eskom, an electronic KM software application was acquired. One of the reasons was to overcome demographic stumbling blocks. Current electronic KM platforms take into consideration collaboration, document management, work flow and interactive knowledge, which enable seamless interaction amongst actors, i.e. stakeholders. In Eskom it was envisaged that a KM electronic platform would have the capabilities to enable experts in the organisation to interact, allowing questions to be asked, e-learning functionality and search capabilities. Furthermore, Eskom did realise that certain parts of the KM framework could be utilised to capture experience-based knowledge of people.

Methodology

In this research, two epistemological approaches were used, which were positivist and interpretive. The positivist approach made use of questionnaires to collect data from the participants. The interpretive approach made use of semi-structured interviews to gain more insight and to

interact with the participants. The latter approach enabled the use of existing documents in the organisation to obtain more information about a problem. On the basis of the type of research undertaken and the unit of analysis, case study is the suitable approach, which made it easy for the research to be undertaken. Interviews, questionnaires and documented papers were used to assist and carry out the research. The population selected for the research was mainly Eskom Group IT staff members in the Enterprise Development, and e-mail was adopted as a means of communication. Group IT employee participants were requested to answer questions via multiple choice options, thus providing the researcher with data that will be analysed and interpreted. One-to-one interviews with participants were conducted to get more information on the research. Fifteen-minute interviews with selected Group IT employees were conducted. Policy documents, minutes of meetings regarding KM and KMS in the organisation were studied. Method triangulation can be identified by the use of questionnaires, interviews and previous documented data. Four main key questions were identified: (1) do managers support KM initiatives in the organisation? (to aim at identifying managers' support and view towards KM); (2) regarding human factors affecting KM in the organisation, how is organisation's culture towards KM? (to look at how Eskom employees perceive KM in an organisation, social interactions and behaviour of employees); (3) regarding non-human factors affecting KM in the organisation, how is KMS (HyperWave) affecting KM in an organisation? (to understand the role IT plays in KM, in this case KMS, also to understand the need to balance emphasis on IT at the expense of social and cultural facets of KM); (4) do employees use or share knowledge as required by the business? (to aimed at determining whether employees share knowledge as required by the business and stipulated by company policy).

Results and interpretation

Introduction

To address the research topic, five groups were identified to assist or undertake the research. The groups are measures of organisational support, knowledge content quality, KMS quality, perceived usefulness of knowledge sharing and user satisfaction. Questionnaires and interviews were used to obtain data about the research topic, which were then written down and analysed. Data analysis was conducted to understand or get a view of the state of KM in the organisation. The research will also evaluate the implementation of KM in the organisation with the aim of retaining or keeping knowledge in Eskom and improving knowledge sharing. Eskom was looked at to determine how the organisation views knowledge and the importance of keeping knowledge thereof, also looking at the measures taken by the organisation to manage or implement KM in the company. The aim of research questionnaire used was to get a view of the KM status in Eskom and also to identify ways in which KM could be implemented to further improve knowledge sharing. Figure 1 depicts feedback received from employees using the hypotheses outlined in this article. The red arrows in Figure 1 show Eskom results that did not conform to the set hypotheses and the ones highlighted in green did conform to the hypotheses.

Measures of organisational support

Leadership: According to participants' feedback, although management took a decision to implement KM in the organisation, it appears that there is a lack of support from the top management to ensure that it does achieve its goal of KM and sharing in the organisation. This can be attributed to the lack of meetings organised by the management, lack of commitment and not periodically reviewing the effectiveness of KM. The top management does view KM as important in the organisation but hardly supports it.

Incentives: Employees are to some extent rewarded for knowledge sharing, but more can be done to encourage employees as participants believe individuals are not visibly rewarded for team work.

Co-worker: As per the feedback received, co-workers are reluctant to share solutions and problems, which is one of the main reasons why KM was implemented in the company. It was also discovered that co-workers do not encourage by action and words to share knowledge.

Supervisor: It is reported that most supervisors do encourage employees to share work-related solutions, which is good for KM. However, there is an issue of not organising regular meetings to discuss or to get a view of how the knowledge could be shared in their department.

Organisation culture: Changing people's behaviour from knowledge hoarding to knowledge sharing seems to be the biggest challenge. Not all employees take responsibility

for KM, and the prevailing notion is that KM is a task for a designated few people, which might be a problem if people have negative view towards KM.

Knowledge content quality: Positive feedback was received from participants as most of them said they do use or refer to shared knowledge. This means that they are of the view of the knowledge shared of good quality; otherwise they were not going to use it.

Knowledge management system quality: Positive feedback was received as most were aware of the deployed KMS in the company. The system is also accessible from anywhere in the company, which makes it easy to be used and regarded as well documented. It must be mentioned that participants regard lack of training as a contributing factor to IT deployment in KM.

Perceived usefulness of knowledge sharing: According to the feedback received, it seems that co-workers and supervisors do not view knowledge sharing as useful, and that supervisors do talk about knowledge sharing, but they do not hold knowledge sharing meetings as often as required. The co-workers do encourage by action to share knowledge. It must be noted that a positive feedback was received from participants as they said KM is significant on employee development, innovation, improving employee competitive advantage, inventory reduction and cost-cutting.

User satisfaction: According to the feedback received, most employees were aware of the KMS (HyperWave) deployed in the company, and they are using the system. It can be said that most employees use shared knowledge, but it must be mentioned that perceived usefulness of knowledge sharing showed that co-workers do not get encouraged by action to share a solution and to share the knowledge. Supervisors do not hold regular meetings to share knowledge, and this might lead to users not being satisfied.

Contribution and future research

The research framework was formed based on the case study using Eskom's HyperWave as the unit of analysis. The problem conceptualisation that was refined to the general framework requires further research to validate its global use. The problem conceptualisation was derived from ST and, in relation to the work of Orlikowski and Robey (1991), can be used for studying the interaction between IT and organisations, the relationships amongst technology, people and organisation. The framework provides more insight on complex interplay of all elements (human and non-human) that could be involved in KMS implementation. The questionnaire as the main data collection technique created the opportunity to use semi-structured interviews to verify and affirm certain data collected to enrich. Analysis of certain documents added more meaning to the data analysis. It must be noted that this paper intended to identify best practice that can be deployed by an organisation to implement KM. The first practical contribution is the understanding provided by the case study. Another is highlighting how things should

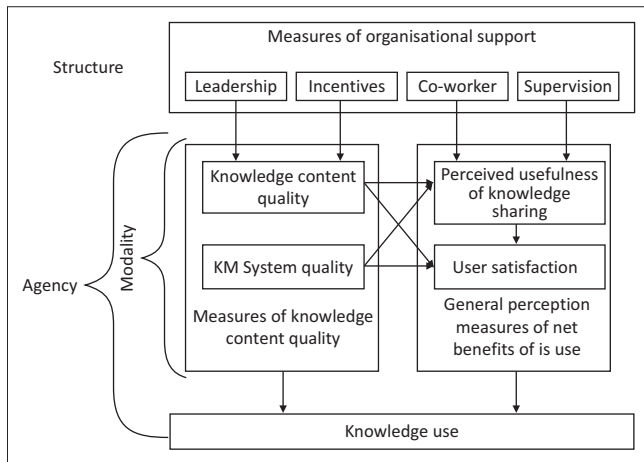


FIGURE 2: General framework: KM improvement model.

be done, in this case, how KMS should be implemented. This is informed by a phase-by-phase approach described by the general framework shown in Figure 2. This could further assist in future and similar projects as the project team will have steps to follow for the project to be implemented to achieve its objectives. Most importantly, the general framework considers human and non-human factors when implementing KMS. What is new in this paper that makes a significant contribution to the body of knowledge is the proposed general framework to guide project leaders in KMS implementation in an organisation. Given the above information, the general framework also adapted the Technology Acceptance Model (TAM) to determine if KMS will be used satisfactorily. TAM was important as, according to Davis (1989), TAM assigns considerable weight to two key determinants: perceived usefulness and perceived ease of use. Additional contribution is the application of ST as the underpinning theory for the study, which was used to conceptualise the phenomenon using Eskom as a case study and the implementation of the HyperWave KMS as an objective of analysis. The theory also guided the literature review process, the design of data collection instrument and the analysis and interpretation thereof. Further contribution is that this paper can be of a contemporary interest to scholars and practitioners in the area of KM and KMS. It was revealed in the literature review process that there has not been enough research undertaken on KM and KMS, but there have been an increasing number of studies, including this paper. This paper also serves as a guide for organisations looking to invest in KM. The final contribution this paper makes is for those in the academia involved in KM implementation (public or private organisation) and ICT/IS research.

Conclusion

The potential to implement effective KM in an organisation exists. However, it is subject to a number of variables in the organisation. The variables concerned are mainly internal. Human agency consists of authoritative resources, which in this research are the top management and supervisors. These authoritative resources need to do more to encourage and

support effective KM in Eskom. Also the organisation needs to put more emphasis on improving organisational culture towards KM. According to the feedback received, IT has no adverse effect on KM implementation in the organisation. Furthermore, according to the feedback received, participants find it easy to use HyperWave, and they do add/share data through the system. In general, Eskom has done a lot to see through KM implementation in the organisation by putting down KM policies. Also having a dedicated KM department in place shows how important KM is to the organisation and deploying IT in the form of KMS (HyperWave) as part of KM. Having invested so much in KM, Eskom needs to further educate its employees on how important KM is not only to the organisation but also to employee(s) themselves to encourage them not to work in silos and not to be threatened by sharing knowledge.

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Competing interests

The authors declare that they have no financial or personal relationship(s) that may have inappropriately influenced them in writing this article.

Authors' contributions

M.T-D. (Cape Peninsula University of Technology) and S.B.M.R. (Tshwane University of Technology) contributed equally to the writing of this paper.

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ICT curriculum integration in modern-day classroom

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Information and communication technology (ICT) curriculum integration is a complex task, and it proves to be a challenge to many organisations and institutions of higher learning. However, ICT serves many purposes including simplifying complex tasks. Many higher education institutions use ICT for innovative teaching and learning. Although ICT has been considered as an educational initiative for the future, it is still not universally understood. This paper presents the role of the ICT curriculum in modern-day classroom and how it should be implemented at a university of technology to enhance teaching and learning. In this study quantitative techniques were used to collect data. Responses from 53 participants in the Department of Office Management and Technology at the Cape Peninsula University of Technology showed the participants' strong views on the significance of the ICT curriculum on the strategies for teaching and learning. Furthermore, the results showed that ICT improves the strategies for teaching and learning. Its integration in modern-day classroom could lead to the transformation of education at the universities of technologies (UoTs). It has been recommended that more research on education technology should be undertaken to develop the strategies for teaching and learning at UoTs to advance transformation in other fields of social science. There is still a challenge on how best education technology could be employed without resistance and without being too costly.

Introduction

Information and communication technology (ICT) is a catalyst for future innovation in teaching and learning practices. ICT transforms the method of delivering the content between the teacher and the learner and also creates an easy access to information. During the 19th century the use of ICT in both public and private sectors was minimal. The production chain relied mostly on the use of human labour. However, in the 20th century it became obvious that more developments emerged in ICT. There were a number of people interacting with the rest of the global community through modern technology systems. Most of the students at academic institutions (i.e. primary schools, high schools, further education and training colleges, and universities) performed multitasks, and others worked from home by accessing material through web-based tools such as Blackboard. These tools and new gadgets enabled the students to create, communicate and access information and solve problems. Aviram (2000:332) asserts that in 1994, 35% of the public schools in the USA had access to the Internet and the number grew to 65% in 1996; the European schools had a slower progress when compared with the USA. The difference in percentage showed the significant role ICT played in education in those countries. However, in developing countries, such as Kenya, there has been a very low access to technology which resulted in less or poor innovations. Bunyi (2013:678) attributed the low access to technology, amongst others, to the lack of strategic implementation of technology and lack of support and training for educators. Therefore, successful improvement in the access to technology must positively impact the socio-economy, and, as Aviram (op.cit.) wrote further, it should include the development and rapid spread of the personal computer, the fax, multimedia, the laptop, the palm point, cellular communication, satellite communications, fibre optics, the Internet, artificial intelligence, mobile connectivity to the Internet, continuous exponential growth in the capacity of computers, smart agents and virtual reality, which would enable people to establish businesses anywhere in the world.

More innovations on technology are introduced at a fast pace and allow people to share information and communicate instantly. The social media such as Twitter, Facebook and Instagram have an increased interaction and information sharing. Globally, governments, stakeholders, staff, students and the community exert pressure on higher education (HE) institutions to introduce modern-day teaching technology in the classrooms. Tabuk District of Education, Saudi Arabia (Alhawiti 2013:177), determined the integration of technology in the classroom as a necessary measure for professional practice. A modern way of delivering

knowledge is important and necessary, especially for the universities of technologies (UoTs) in South Africa. The expectation is that ICT integration in the classroom should bring about the solution to skills shortage, especially in the areas of technology, education, engineering and medicine. It is also necessary for bridging the gap between the disadvantaged and advantaged groups in a multiracial classroom environment. However, there is an opposing view, on ICT curriculum integration, that it would not make any impact because most of the students are from disadvantaged communities and do not have access to computers after school hours. The argument goes further to say that ICT integration does not guarantee an effective learning process and students' success. The view is that students can still acquire knowledge without the use of education technology and that naturally people will inevitably resist a change. However, it will be the responsibility of the policy-makers and administrators to ensure that ICT is integrated, and the issues of change are being addressed.

The primary objective of this paper is to discuss the significant role of the ICT curriculum in modern-day classroom at the UoTs in South Africa and how it should be integrated into daily learning modes to allow and encourage active learning (Aviram 2000). The paper also reviews the literature on the ICT pedagogical method for knowledge transformation and discusses the general framework for transformation of education, which was adopted after extensive literature review and data analysis. The paper also highlights the significance of the rationale behind the strategies for incorporating technology in the classroom.

Literature review

The significance of ICT curriculum integration

The integrated ICT curriculum pedagogy allows students to use computers to access information and form collaborative groups to solve complex tasks in various learning areas. Alhawiti (2013) believed that the success of ICT integration is based on evidence-based policy formulation. This policy formulation should guide the strategic implementation of such a technology within the universities. Jaffer, Ng'ambi and Czerniewicz (2007:131) argued that the central role of educational technology is to provide additional strategies that can be used to address the seriousness of environmental and educational challenges in UoTs in South Africa. Therefore, the formulation of evidence-based policy should speak directly to these challenges and proposes the solutions needed. This will enable students to acquire more knowledge and to adapt to evolving technology innovations by doing things differently. The role of technology in education is vital in globalising challenges faced by HE institutions. It has the ability to change and shape the educational system to conform to current practices. For example, South African education is faced with the general lack of academic preparedness, multilingual needs in English-medium settings, large class sizes and inadequate curriculum design (Jaffer *et al.* 2007). These and many other challenges

could be seen as the most common trend in teaching in HE institutions, and they have tremendous possibility to affect the new developments around the educational sphere. Moreover, since the new dispensation in South Africa, HE institutions have to deal with large classes, which are becoming difficult to manage and prepare for, putting more strain on effective interactions between the students and the teachers. However, ICT integration is significant because of its prevalence in the 'modern era' and its potential to change education environment, and it is also an effective tool for classroom management for teachers (Aldossari 2013). It should be employed as a tool for the development of relevant and locally produced content (Unwin 2004:2).

Teaching and learning models

The ICT teaching and learning models (TLMs) should assist students to be able to draw a comparison from more than one variable. These learning resources are very crucial for developing innovation and creativity. Ogbonnaya (2010:51) believed that the TLMs motivate students and could instil the learning curiosity if employed correctly, enabling students to want to learn further. Furthermore, Ogbonnaya (2010:50) stated that these models enable students to be creative in examining changing relationships, which in return are able to answer 'what if' questions. Different business organisations make use of different technologies to add value to the existing business dynamics, etc. and often drive the integration of IS/information technology (IT) strategy with business strategy, establishing the business requirements for information systems (Edward *et al.* 1991). For example, a small- or medium-sized enterprise in the developing world could be a significant model of technology adoption (Uwizeyemungu & Raymond 2011:141). Companies and firms need to be capacitated to be able to use IT (Uwizeyemungu & Raymond 2011). Basole (2006) believed that the role of mobile technology was significant in the transformation of business. Luo, Warkentin and Li (2013:65) argued that organisations using mobile technologies should devise strategies to remain competitive and relevant in the market and should cater to all customers' needs. The ICT should play a significant role in making sure that the environment within which these technologies operate allows such advantages. Uwizeyemungu and Raymond (2011:14) asserted that businesses should be able to adapt to the environments within which these models are adopted in order to thrive. However, the provision of quality service and competition remains a challenge to these small organisations, which experience skills and capacity challenge and are unable to attract world-class resources as well as the required workforce.

Conceptual framework

As shown in Figure 1 it is necessary to develop a conceptual framework that seeks to assist in the data collection and analysis of the results. The purpose of the framework is to give meaning and understanding to the role of technology education for the transformation of education. The literature indicates that there is still a gap in the TAM for the transformation of education.

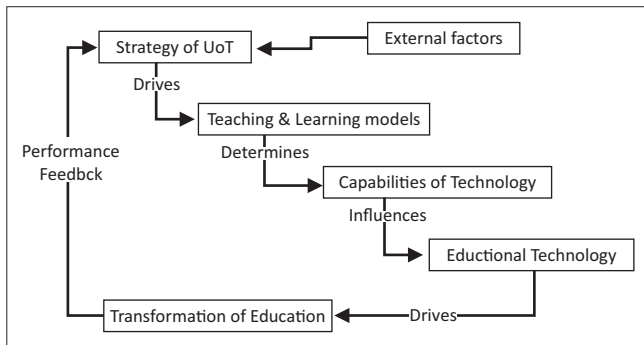


FIGURE 1: Problem conceptualisation.

Furthermore, in the context of adopting change on educational landscape, Hramiak and Boulton (2013:91) argued that rapid technological development across Europe required teachers to be aware of the latest technology to improve their skills. However, Wallace (2012:1) was of the view that the resultant increase in the pace of change added complexity to business and social environment. He further stated that managers, academics and professionals had shown a great deal of interest in ICT innovation in organisations. As mentioned earlier in this paper, change is essential in secondary schools in Europe, and it can be applied to many UoTs in South Africa for the development of skills and knowledge in the educational sector. A further significant issue pointed out by Hramiak and Boulton (2013) is that teachers need to be familiar with the latest technology. This familiarity will help them to enhance their teaching and learning as well as innovation skills. There is a need to align the successful integration of technology in the classroom with a teacher's performance. Hramiak and Boulton (2013) further asserted that the literature had shown that this is possible with appropriate pedagogy to improve their critical skills necessary for the adoption of modern technology in classrooms.

Research methodology

Introduction

Research philosophy centres around two distinctive schools of thought: qualitative and quantitative techniques. Numerous studies have drawn distinctions between these two methodologies. For example, Sale, Lohfeld and Brazil (2002:43) argued that the two paradigms did not study the same phenomena; quantitative and qualitative methods cannot be combined for cross-validation or triangulation purposes. However, these methods can be combined for complementary purposes. These methods do so to emphasise the different underlying philosophies as well as to arrive at the intended outcomes of the research. There was no qualitative data collected; therefore, it is not discussed. The aim of selecting the quantitative research was to describe a particular phenomenon through the numerical sample of data collected and analysed. Mathematical or statistical software such as Statistical Package for Social Sciences was used to convert the data into numerical format. Data were collected from a randomly selected sample and

therefore used to address key questions from the research. Quantitative methods can also be used in instances whereby data to be collected are not quantifiable by nature, but instruments such as questionnaires are designed for such purposes. The participants were offered an opportunity to respond to a number of statements. Jamieson (2004:1217) alluded that the response categories have a rank order; for example, 1 represents strongly agree, 2 agree, 3 disagree, etc. Amaratunga *et al.* (2002) suggested that this approach placed considerable trust on numbers that represent opinions or concepts. Moreover, the quantitative method was preferred for this research because it gave the respondents an opportunity to select a statement, which best suited their preference. Over the years, social researchers have favoured quantitative rather than qualitative approaches because of the freedom to choose from a list of options, the one that best describes your views about the variable. As Blanche, Durrheim and Painter (eds. 2006:132) argued, most researchers preferred to measure issues such as malnutrition, life expectancy and depression as opposed to interviewing people about such matters.

Quantitative method

The quantitative research concentrates on the numbers that resemble a certain opinion. Will, Bertrand & Fransoo (2002:241) believed that a quantitative approach has been the basis of most of the initial research on operations. On the other hand, Stansfield (1995:36) suggested that quantitative research had been applied to a wide variety of property research topics such as measurement of property research portfolio performance. In essence, quantitative research methods explain a particular phenomenon or particular question and also collect numerical data. It is also an effective research method employed to collect data in a numerical format based on a number of statements. For example, 1 represents strongly agree and 5 represents strongly disagree by using instruments such as questionnaires. Structured interviews and questionnaires are often employed. Researchers have always viewed quantitative research as equivalent to positivism. Bhattacharjee (2012) stated that positivism was used in quantitative research, whereby experiments and surveys are being conducted. Amaratunga *et al.* (2002:18) argued that logical positivism used quantitative and experimental methods to test hypothetical-deductive generalisation. Therefore, quantitative methods include the following techniques:

1. Questionnaires
2. Observations and
3. Primary investigations

Results and discussion

This section presents the analysis of data collected for the study. The Department of Office Management and Technology at the Cape Peninsula University of Technology (CPUT) was the unit of analysis. The conceptual framework that was developed for the study is reintroduced and briefly discussed in this section.

Knowledge of applications

Figure 2 shows the knowledge, which the participants have on different software used by the CPUT. The results show that all respondents have knowledge of MS Office applications. Therefore, MS Office Application is the most used office application at CPUT. Furthermore, the results show that 43 out of 53 respondents have indicated that they have knowledge of Blackboard (LMS). Once again, this shows that the many of students at CPUT use LMS for teaching and learning purposes, and most of them know how to use it. The results agree with Alavi and Leidner (2001:1) when they argued that the web-based courses were very crucial to allow students an opportunity to study from home. They further wrote that in the knowledge economy there was a high demand for highly skilled employees to contribute towards the production of new knowledge. This should be combined with a strong penetration rate at which IT presents, at an extraordinary potential for the transformation of educational and learning processes.

I use learner management system (Blackboard) for my studies

From the graph above it is clear that most students have knowledge on LMS application. The primary objective was to establish whether the respondents use this learning tool and whether it impacts on their level of performance. The results are shown in Table 1.

Table 1 shows that 53 responses were projected as follows: 52.8% of 53 respondents have agreed that they use Blackboard as an educational tool to manage their school work. This percentage indicates that most students rely on LMS to do their school work, which signifies the role of education technology in the transformation of education at CPUT. The results further show that 45.3% of 53 respondents indicated that they strongly agreed that they use LMS for

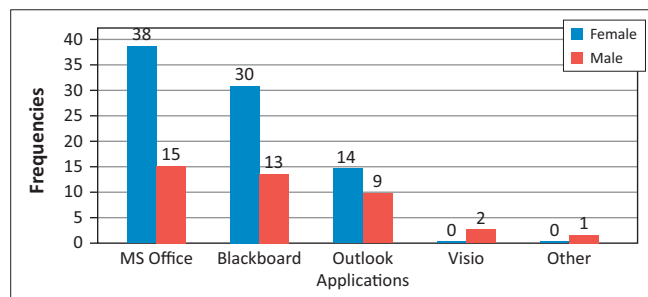


FIGURE 2: Knowledge of applications.

TABLE 1: The use of learner management systems.

Variable	Answer	f	%	Valid %	Cumulative %
Valid	Strongly agree	24	44.4	45.3	45.3
	Agree	28	51.9	52.8	98.1
	Strongly Disagree	1	1.9	1.9	100.0
Total		53	98.1	100.0	-
Missing	System	1	1.9	-	-
Total	-	54	100.0	-	-

f, frequency.

teaching and learning purposes. It seems like many of the students see the need to have this tool for teaching and learning. The highest percentage, as argued by Alavi and Leidner (2001), is attributed to the fact that the application of technology to education and training underscores a fundamental need to understand how these technologies improve the learning process. It further shows the significant impact the increased use of web-based learning tools, such as LMS, could have on the transformation of education at CPUT. However, its usage depended largely on whether the teacher/educator is instructing students to use it by placing reading material on it. Therefore, it is important for educators to communicate to learners the significance of usage of such material.

Education technology is important part of teaching and learning strategies

The CPUT's teaching and learning strategies are very significant in the transformation of education. This section discusses the responses of the above statement. The results are shown in Table 2.

The results given in Table 2 show that 59.6% out of 53 respondents have strongly agreed that education technology is an important part of teaching and learning strategies. This is followed by 36.5% of respondents, who also indicated that they agreed with the statement (8). Both percentages represent the biggest percentage of those who hold positive views on the statement above. Therefore, these results imply that the modern-day class should be equipped with the kind of technology that would enhance teaching and learning to ensure that strategies are implemented. As Su *et al.* (2005:7) pointed out, modern technologies should be the driver of education in modern-day classrooms. This statement affirms the responses as per statistics above. The next section presents a summary of the data analysis and the interpretation of data that has been discussed in this article.

Summary of data analysis and interpretation

The role of education technology in the transformation of education at CPUT is significant and should be seen as a key driver towards quality education. A conceptual framework was used to guide the collection of data. The data reveal that most of students rely on education technology to access and process material. Furthermore, they believe that technology drives transformation. However, there is a need for CPUT to expose students and educators to various tools

TABLE 2: Universities of technologies strategies.

Variable	Answer	f	%	Valid %	Cumulative %
Valid	Strongly agree	31	57.4	59.6	59.6
	Agree	19	35.2	36.5	96.2
	Strongly Disagree	2	3.7	3.8	100.0
Total		52	96.3	100.0	-
Missing	System	2	3.7	-	-
Total	-	54	100.0	-	-

of learning to ensure that transformational objectives are achieved. The advancement of transformation, especially the issues of teaching and learning, requires everyone's contribution. Most importantly, it requires leadership and resources. There is a need to ensure skills development and to encourage classroom interaction to close the knowledge gap and to transform education at CPUT. Therefore, this study recommends and affirms the general framework that it proposes could be applied to similar situations at other UoTs in South Africa.

Conclusion

The global communities are advancing towards technology-centred education. South Africa is also following the same approach on transformation. The HE in South Africa has been pressurised by stakeholders, i.e. government, student organisations, educators, students, unions representing workers, policy administrators to consider integration of ICT in the classrooms. The integration of ICT in modern-day classroom is possible if the strategy for implementing educational technologies is in place and supported by all stakeholders. The general framework has been proposed to be employed to support the transformation of education. The paper further recommends that the management of HE institutions should ensure that students and educators receive continuous training on how to use these tools. The training provided should ensure that they are able to access teaching and learning material on time and submit on time, as well as being able to access important policy documents on transformation. The paper argues that ICT integration is necessary for the transformation and development of education in South Africa and to address the shortage of skills.

Recommendations

Education technology proposed be analysed before and during the process of implementation; students at CPUT should be exposed to various tools of learning. The management of CPUT should ensure that students and educators receive continuous training on how to use these tools. The training provided should ensure that they are able to access teaching and learning material on time and submit on time, as well as being able to access important policy documents on transformation. In Singapore (Chen, Tan & Lim 2009:1) teachers improved the process of adopting technology in education through different stages. The educators must be well informed about the new change that is going to take place and should receive proper training on how to use the new technologies. Furthermore, this study recommends the implementation of the general framework (see Figure 3) developed, based on the conceptual framework and the literature reviewed, as well as the data analysis. The general framework should be used to assist CPUT, especially the Department of Office Management and Technology, to employ the education technologies that support the transformation of education.

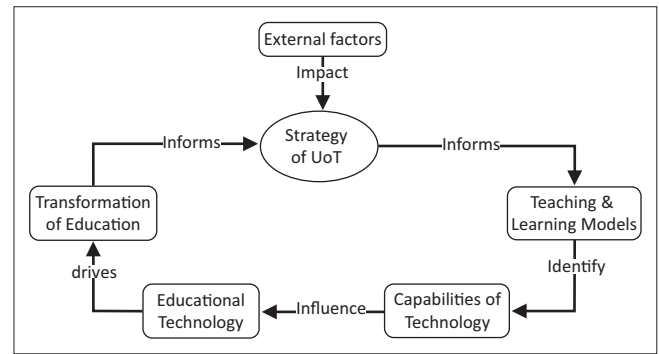


FIGURE 3: The proposed general framework.

Strategy of university of technology

Institutions of higher learning and business organisation must strive to reposition themselves in the market and craft a sound strategic plan/vision which will make them unique. They must do in conjunction with ICT curriculum support system to strengthen and enhance education. Tosun & Barişusing (2011:223) believed that the strategy should define the skills that educators should possess in ICT. Furthermore, Shuva (2010:495) believed that it was significant for teachers to do more practical training to demonstrate knowledge of ICT application in the classroom to ensure that the investment is not going to be a waste. Therefore, the UoTs should ensure that there are ICT resources in place to strengthen teaching strategies that are more learner-centred and focus on the needs of learners. In Singapore, for example, there have been efforts towards the integration of digital technology into the curriculum, pedagogy and assessment (Yeung *et al.* 2014:136). The aim of this integration was to transform students' competencies in the classroom by integrating the Ministry of Education, which was responsible for developing ICT policies, and the National Institute of Education, which was a 'sole provider of initial teacher education and schools'. Hence, this study argues that it is significant for UoTs in South Africa to consider educational strategies that have the ability to drive TLM for transforming education. And finally, the university must ensure that the implementation of strategies is followed by the monitoring, evaluation and feedback processes for the purpose of quality assurance.

TLM for UoTs

The TLM for UoTs should be directives for strategic transformation and development of education in the classroom. Miller *et al.* (2004:30) recommended that colleges should use the results of their work to improve teaching in their own classroom. It is therefore imperative for TLM to play a significant role in ensuring the effective delivery of curriculum and also allow greater participation from all learners. Prior to the implementation of TLM, the management of UoTs should consider the capabilities of ICT infrastructure in place. According to Rahimnia, Polychronakis and Sharp (2009:246) for the planning and implementation to take place, the decision-makers must play an active role. This is to allow management to better understand the capabilities of

these technologies. Therefore, the adoption of UoT's strategy model shown in Figure 3 should be aimed at assisting the decision-makers to improve the environment of learning.

Capabilities of technology

Another important element for the management of selected UoT is to consider the effectiveness of the technologies employed for the transformation of education. These technologies should enable the institution to carry out its mandate without any challenges. Petrova and Claxton (2005:27) argued that to maintain student skills development as well as ensuring technology capabilities, the universities should consider the industry-related learning models such as cooperative education to keep up with the demanding technology. Alampay (2006:4) believed that ICT has been regarded as an important means for development and for measuring the capabilities of other existing technologies. The necessary training should also be provided to users (educators and students) of education technologies. This will ensure that there is preservation of the necessary skills at the institution. Furthermore, the technology capabilities must influence the education technology in place or that of the future.

Education technology

The integration of teaching and learning technologies is very significant for UoTs and for the transformation of education in South Africa. In Sweden, for example, higher education in engineering was the driving force for economic growth, global competitiveness and the sustainability of welfare state (Hallström, Hultén & Lövheim 2014:121). Therefore, it is necessary for this education technology to be recommended for the selected UoT to advance and improve students' level of competence, and achieve this the education technologies should be influenced by the capabilities of existing technologies as well as the ICT infrastructure in place within the UoTs. It is important for this research to consider Potgieter's (2013:969) argument that the management of UoT should consider 'the instructional strategy for the particular technology education programme to be adapted to include the Education Technology-based learning outcomes' for teaching and learning. If these components are not in place, the implementation of education technology could not be achieved. Therefore, it is important for the management of UoTs to review the capabilities of existing technology and then make decision as to which technologies to employ for teaching and learning.

Transformation of education

The HE sector needs to develop so that the set goals could be achieved. This is important especially in developing economies such as South Africa. The framework previously mentioned shows that transformation is driven by the nature of education technology employed to improve teaching and learning. It should also determine which TLMs are appropriate for the enhancement of education.

Sutherland *et al.* (2004) argued that when ICT was integrated into specific subjects, the teachers could use it to develop themselves and transform their knowledge. However, it is important to note that there are external factors which often impede the transformation of education. Often, these are factors which teachers and management have no control over. All over the world ICT brought about drastic changes in education systems. This change has prompted the HE institutions to be aware of the following external factors, i.e. government policies, migration, new technology, decline in economy, learning environment, etc. Therefore, it is important for the management of UoTs to consider all these factors when developing strategies for educational transformation.

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Competing interests

The authors declare that they have no financial or personal relationship(s) that may have inappropriately influenced them in writing this article.

Authors' contributions

P.M. (Cape Peninsula University of Technology) and M.T-D. (Cape Peninsula University of Technology) contributed equally to the writing of this article.

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Improving the information security in SMEs to protect customer's personal identifiable information

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Small and medium enterprises (SMEs) are increasingly making use of e-commerce to increase profitability. SMEs often do not have the necessary internal controls in place to secure the personal identifiable information (PII) that is collected from customers during e-commerce transactions because the size and nature of an SME prevent it from addressing these risks. This article explores the critical success factors (CSFs) that must be considered by an SME to protect the PII of customers collected on their e-commerce site. A literature review was performed to identify possible barriers for the implementation of information security in SMEs. Furthermore, the Confidentiality-Integrity-Availability triad and ISO/IEC 27002 standards were used to group the identified barriers, and from this process CSFs were formulated for consideration. There are six CSFs that were identified to improve the information security in SMEs, which include management commitment, information security training, access control, infrastructure security, security policies and periodic audits. The recommendation of this paper is that these six CSFs must be considered to improve the information security of SMEs in South Africa.

Introduction

Small and medium enterprises (SMEs) are crucial to the economic stability of developing countries (Duan *et al.* 2002). In South Africa, SMEs contribute to 35% of the national gross domestic product (GDP), which therefore plays a vital role in job creation, investment, income generation and poverty alleviation (Abor & Quartey 2010). For an SME to be sustainable there are many opportunities for the owner to consider. One such opportunity includes the use of e-commerce to expand the customer base in the global market. However, because of the implementation of new technologies, some problems can be expected. SMEs in South Africa are characterised by poor information and communications technology utilisation and limited human and financial resources, which expose the SMEs to new risks (Parida, Westerberg & Ylinenpaa 2009). Typical problems that SMEs will encounter in the area of e-commerce include changes in technology, innovation of products and customer demands (Abor & Quartey 2010). One of the main risks associated with e-commerce is the security of customer information, also called personally identifiable information (PII). Although there are legislations in place to protect the customer, SMEs are known not to comply with these information security standards (Campbell & Hartcher 2015; Jiang & Li 2010; Ju Xiang 2009). SMEs either do not understand the privacy risks associated with the loss of customer information or, if they do, are overwhelmed by the security standards and regulations that must be implemented (Campbell & Hartcher 2015). This problem is further compounded as the SME typically has limited human and financial resources available to implement information security controls (Powell 2011).

This article explores the critical success factors (CSFs) that must be considered by an SME to protect the PII of customers collected on its e-commerce site. To accomplish this goal, a qualitative literature search was conducted. Relevant papers reflecting the purpose of the study were identified from four databases: ACM, EBSCO, ProQuest and JSTOR. A search strategy was used to identify articles with 'small and medium enterprises', 'information security', 'privacy' and 'personal identifiable information' as keywords. Papers published between January 2000 and October 2015 were considered, without language restriction. The literature search identified 53 references. The reference titles and abstracts were reviewed by one author for relevance to the study. The identified articles were analysed, making use of an inductive approach to contribute to the argument and CSFs presented in the paper. The purpose of the search was to identify relevant, high-quality studies that documented the barriers that prevent SMEs from implementing internal information security controls to protect the PII of their customers. The rest of the paper is structured as follows: the next section provides a definition for SMEs, as well as an explanation of what PII entails. This is followed by a discussion of the risks that are associated with both SMEs and the collection of PII. Subsequently, an overview of the Confidentiality-Integrity-Availability

(CIA) triad, ISO/IEC 27002 Security Standard and the four pillars of information security will be provided, and finally the CSFs to enable an SME to protect the PII of customers on its e-commerce site will be discussed.

Literature review

The characteristics of an SME are most commonly used to determine if a business falls into this category. The characteristics include the number of employees that the business employs, the annual turnover, capital assets and the SME's contribution towards the GDP (Abor & Quartey 2010). In South Africa, an SME is recognised by the *National Small Business Amendment Act* (2003) as an organisation that employs no more than 250 employees with a turnover of less than R4 million and a total gross asset value of less than R2 million. Recently, SMEs have started to use e-commerce to improve the geographical reach of their business and attract new customers (Cheng 2009). Beckinsale, Levy and Powell (2006) found that there are three drivers that determine if an SME will adopt e-commerce, which include the perceived benefits, organisational readiness and external pressures. The perceived benefits of e-commerce for an SME include a reduction in operation costs and an increase in market share because of increased visibility in the global market (Jahanshahi *et al.* 2012). The flexibility of SMEs enables the business to quickly respond to new business needs, such as e-commerce, as decisions can be taken quickly by the owner (Karahanna *et al.* 2013).

Organisational readiness refers to the aptitude of the owner to take risks and the availability of appropriate information technology (IT) infrastructure (Alghamdi, Nguyen & Jones 2013). Olatokun and Kebonye (2010) stated that SMEs tended to be labour-intensive rather than capital-intensive as the business cannot afford the IT equipment to automate tasks and services. The degree of formalisation in an SME refers to the extent to which a business's work is standardised (Robbins 2006). Most SMEs are family-orientated businesses and are dependent on the interaction of a small number of people employed by the business. The size of SMEs means that there is a low degree of formalisation with no clear hierarchical structures or policies and procedures about how the company operates as the owner is responsible for most of the decision-making (Nicolescu 2009). Often there is also an informal environment in the SME, which deters the owner to establish effective governance systems to promote accountability amongst employees (Jiang & Li 2010; Nicolescu 2009). The importance of IT governance in the SME will depend on the knowledge and skill of the owner. If the owner does not consider the protection of the PII of their customers as a priority, or does not have the necessary skills to manage the information security of the website, it is unlikely that proper security controls will be put in place (Nicolescu 2009). In addition, Abor and Quartey (2010) stated that the employees of an SME usually did not possess any specialised skills and that SMEs also tended not to invest in their employees' training and development because of insufficient funds. This means that it is highly unlikely

that the employees will be able to develop or maintain an e-commerce site for the business (Shemi & Procter 2013). External pressure refers to the needs of the customers of the SME to make use of e-commerce as a convenient tool. The literature reports that customers need to be assured that their information that is provided on the websites will be protected (Jiang & Li 2010; Teketel & Berhanu 2009). This lack of information security controls for an SME can undermine consumer trust, as the software and security measures, such as third party assurance seals, are too expensive for the SME to purchase (Olatokun & Kebonye 2010).

Personal identifiable information

PII is commonly referred to as any form of information that can be used to identify, locate and contact an individual (Narayanan & Shmatikov 2009). The information collected could include an individual's demographics, address, financial details, educational status or employment history (Jessup & Neal 2009). Hackers often steal this information with the goal to combine the pieces of personal information, which in itself appears innocuous, in order to compromise an individual's identity (McCallister, Grance & Scarfone 2010). PII can be compromised in two ways: when data are transmitted across an e-commerce network or because of the physical theft of devices that store sensitive information. The latter is possible in an SME because of poorly understood data and security practices. If there are no internal controls in place to secure PII, the SME will not even be aware that sensitive data are taken from the system (Jiang & Li 2010). Because of the lack of financial and technical resources, SMEs are often unable to observe good governance practices in the business. An information security policy is an effective means of defining, describing and documenting security principles that are based upon SMEs' core beliefs. The policy should also establish a standardised baseline of expectation for the behaviour of all personnel as to comply with regulatory mandates and governance principles. Therefore, the policy will minimise or prevent any form of risk in order to protect the company assets and PII of customers (Ihonvbere 2010; Tittel 2008). Security and privacy policies are often not considered to be important in an SME, as it does not contribute directly to the profit margin of the business (Glynn 2012; Park *et al.* 2008). The lack of information security controls leaves the SME susceptible to possible instances of fraudulent activities, whether from an external or internal threat (Campbell & Hartcher 2015; Jiang & Li 2010). It is therefore important that the information security standards of the business are either in place or improved. This is achievable through the implementation and utilisation of internal controls within the SME. If these are in place, it will improve the trustworthiness of the e-commerce site of the SME, which in turn will improve the profitability of the business (Michel 2012).

CIA triad – Model of security

The CIA triad is an information systems security term that relates to the important aspect of data protection. This security model was developed as a tool to put in place

measures relating to information security. The main objective of information security is to assure the confidentiality, integrity and availability of PII that is crucial for the continuity of a business's operations and functionalities (Ihonvbere 2010; Tittel 2008). The following section discusses the confidentiality, integrity and availability triad as can be seen in Figure 1.

Confidentiality of data: The purpose of confidentiality is to ensure that PII is only accessible by authorised individuals. Confidentiality also relates to the broader concept of data privacy, thus limiting the access to PII within an SME (Whitman & Mattord 2009). The next section of the CIA triad relates to data integrity.

Integrity of data: Data integrity relates to the assurance as well as the trustworthiness of information that data have not been altered inappropriately, either accidentally or deliberately (Whitman & Mattord 2009). Any information that is transmitted or recorded and entered into the system should reflect actual, reliable and correct records or instances, without corruption (Ihonvbere 2010; Whitman & Mattord 2009). The following section discusses the final aspect of the CIA triad: availability of data.

Availability of data: The last aspect of the CIA triad, availability, guarantees that PII is readily available to authorised users because modern businesses are highly dependent on a functioning information system (Whitman & Mattord 2009).

Confidentiality, integrity and availability are often taken for granted by SME owners. Information security is often associated with services that engage with sensitive information, such as financial, legal, human resources or business documentation. SMEs question the need for security

controls in their business as this type of information exposure is limited (Campbell & Hartcher 2015). The following section will discuss the ISO/IEC 27002 security standard.

ISO/IEC 27002 standard

The International Organization for Standardization (ISO/IEC) is the world's largest developer of voluntary International Standards (ISO/IEC 27000 2014). The ISO/IEC 27002 standard provides a 'code of practice' that can be used for high-level security management that is intended as a common basis and practical guideline for SMEs to develop security standards and effective security management practices. The standard is based on 11 sections but cannot be used for certification purposes. Instead, the ISO/IEC 27001 standard was developed as an information security management system (ISO/IEC 27000 2014). The objective of these standards is to ensure compliance with all statutory, regulatory, certificatory or contractual obligations, and these requirements should be explicitly defined, documented and kept up to date (ISO/IEC 27000 2014). The following section introduces the CSF developed to ensure that internal control in the SME will provide for the secure collection and storage of PII.

Critical success factors

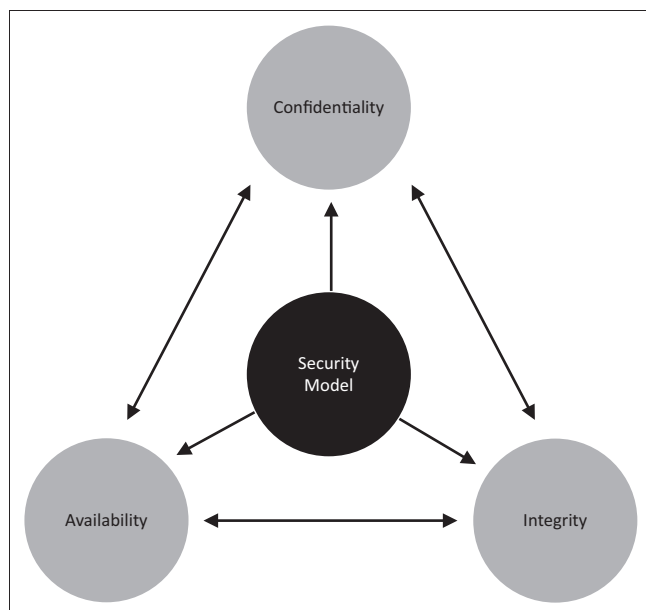
The focus of this paper was to identify CSFs that are necessary to ensure that internal information security controls are in place in SMEs to protect the PII of their customers. The CIA triad provides the general foundations for the development of the CSF. Additionally, the ISO/IEC 27002 Security Standard was discussed as it provides a code of practice for information security management. A CSF refers to the specific activities, procedures or areas that a business depends upon for success or survival and is unique for each SME. The CSFs that are recommended for an SME to make sure that there are internal controls in place to protect the PII of customers are discussed in the following sections.

CSF01 – Management commitment

The owner of an SME has a commitment and responsibility to ensure that an information security policy is in place. As discussed earlier, the knowledge of the owner will determine the level of attention that is given to security controls in the SME. In addition, the owner should ensure that the policy is enforced and managed in accordance with ISO/IEC 27001 and 27002 security standards (Binder *et al.* 2010; Shanmugam, CheHaat & Ali 2012). Once the policy is in place, the next step is to provide user training and awareness programme.

CSF02 – Information security training

The second CSF relates to employee or user awareness and training. It is important that all employees of an SME should receive some form of training with regard to the security policies of the SME, as this training will encourage compliance (Mendes 2012). Furthermore, if the information security knowledge of employees increases, they will be able to help the SME recover from undesirable situations, as



Source: Bhajji, Y., 2008, Chapter 1 – Overview of network security, Cisco Academy, Indianapolis.

FIGURE 1: CIA triad.

well as be able to detect situations that can lead to adverse situations (de Vos & Willemse 2011; Kelly 2011; Mendes 2012; Shanmugam *et al.* 2012). Following the implementation of employee or user awareness and training, it is essential that an access control system is placed within the business.

CSF03 – Access control

Access control relates to the appropriate physical access controls, guards and surveillance systems that are implemented within an SME. The goal of this CSF is to ensure the protection of the work environment, as well as any other areas that contain sensitive information assets (Kelly 2011; Park *et al.* 2008). The following CSF relates to the Infrastructure Security Standards that must govern the information security policies in the SME.

CSF04 – Infrastructure security

Infrastructure security relates to computer and network security procedures and methods. As such, the IT staff or IT vendors are able to securely manage the technological infrastructure in a defined and documented manner that adheres to effective information security practices. This ensures the compliance of regulatory standards for the protection of sensitive organisational information, as well as the prevention of unauthorised access to this information (Kelly 2011; Park *et al.* 2008). With an effective and efficient security infrastructure in place, the next CSF relates to the implementation of security policies to ensure that a secure environment is possible through regulations and standards.

CSF05 – Security policies

Security policies relate to how an SME has defined and documented its management approach to security and legal compliances. More importantly, these security policies must be implemented in a manner that complies with the SMEs' responsibilities and duties to protect confidential and sensitive information, as well as prevent any access, exposure or distribution of such information (Binder *et al.* 2010; Park *et al.* 2008). Subsequently, with an efficient security policy in place, it is important to continuously assess the various policies and regulations in place. This therefore leads to the final CSF.

CSF06 – Periodic assessment

The final CSF relates to periodic assessment. This factor aims to ensure that an SME pertains to an assessment or review of its security programme and policies, dealing with managerial and technical aspects. It is important that this assessment is conducted annually to further ensure security and reliability of an SME. With the integration of periodic assessments within the SMEs, information and data loss or theft prevention can be dealt with effectively and sufficiently, furthermore contributing to the importance of security and regulatory policies (Binder *et al.* 2010; Shanmugam *et al.* 2012). The following section provides an overview of how each of the CSFs can be mapped to the four pillars as discussed in the previous section.

Critical success factors and the four pillars of information security

The four pillars of information security refer to the different aspects that an SME should take into consideration to assist in ensuring that sufficient security standards are met. The four pillars are based on data protection and recovery, the detection of unwanted states of access and furthermore the compliance with regulation, standards and policies. These pillars focus on an SMEs' perspective in ensuring organisational and customer security:

- Protection: protecting confidential and sensitive information;
- Detection: detecting or preventing of unwanted states or programmes from unauthorised access;
- Recovery: making initiatives in the case of an emergency or unexpected, unwanted situation; and
- Compliance: ensuring that policies, standards and legal regulations or requirements are organisationally met (Shanmugam *et al.* 2012).

It is essential that the CSFs identified above are able to ensure the enforcement of regulations and policies, as well as the protection of PII. Table 1 provides an illustration of how each CSF aligns with the four pillars in assisting with the security concerns of SMEs previously discussed previously.

From Table 1 it is noted that the CSF will assist an SME to be compliant with various security standards, policies or regulations. Compliance is one of the key aspects that will determine the successful protection of PII. SMEs are often overwhelmed by the volume of security standards and regulations that must be complied with. Additionally, SMEs do not comprehend the potential risks associated with not having to comply with such standards and regulations, which result in the ignorance of security measures. The identified CSFs will provide the SME with a specific security framework that it can use to make sure that the necessary internal controls are in place to protect and detect potential harmful situations during the collection of PII.

Conclusion

This article explored the CSFs that are considered by an SME to improve the protection of the PII of customers collected on e-commerce sites. This was done through an in-depth literature review of experts in the field of information security and internal controls as well as PII collection, resulting in

TABLE 1: CSFs and four pillars.

Success factors	Protection	Detection	Recovery	Compliance
Top management commitment	-	-	-	√
Employee and user awareness/training	√	√	√	√
Access control	√	√	-	√
Infrastructure security	√	√	-	√
Third-party assurance	√	-	-	√
Security policies	√	√	√	√
Periodic assessment	-	√	-	√

the CSFs. These CSFs were created through the utilisation and understanding of the CIA triad and ISO/IEC 27002 Security Standards. The CIA triad provided a foundation of information confidentiality, integrity and availability, whilst the ISO/IEC 27002 provided a more in-depth observation of information security. Therefore, the CSFs can be utilised in an SME to ensure that any PII that is collected is effectively and efficiently secured and managed, in addition to creating a more secure working environment. Once a secure environment is achieved through the implementation of these CSFs, the mitigation of the risks discussed in the research is possible.

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Competing interests

The authors declare that they have no financial or personal relationship(s) that may have inappropriately influenced them in writing this article.

Authors' contributions

F.E. (University of Fort Hare) and L.C. (University of Fort Hare) contributed equally to the writing of this article.

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Indian *Companies Act*, 2013 – Changing the face of CSR in India

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The Indian *Companies Act*, 2013, is the first of its kind in the world. One of the most applauded aspects of the new Company Law regime is the mandatory corporate social responsibility (CSR) spending requirement, which is governed by Section 135 of the act. The CSR provision would change the way Indian corporates do business because till now CSR has largely been a voluntary contribution by corporates. The choices we make today are going to influence our generations to come. This provision can make CSR a driver of capital formation in neglected areas of national interest as India is a fast-growing emerging economy but also faces numerous human development challenges. It is clear that there will be an immense flow of funds and this flow will help companies effect the pressing societal challenges, but a disciplined approach is necessary so that companies can make an unprecedented contribution to India's future. This paper makes an attempt to understand the provisions of Section 135 of the new *Companies Act*, 2013, its implications and implementation. It also studies the spending patterns before the implementation of the act and the henceforth expected change.

Introduction

The Indian *Companies Act*, 2013, the first of its kind in the world, redefines the landscape of the Indian social sector, heralding a new era on the path to inclusive growth (FICCI–Accenture 2014). One of the most applauded aspects of the new Company Law regime is the mandatory social spending requirement (corporate social responsibility, CSR) governed by Section 135 of the act. Faced with innumerable economic and social challenges as our country is, our lawmakers could not have ushered in a more revolutionary change through the new law (Vaidyanathan & Thacker 2014). The CSR provision would change the way Indian corporates do business because till now CSR has largely been a voluntary contribution by corporates (Grant Thornton). Even as many companies have been reaching out to the under privileged for decades, driven by the trusteeship concept, there are several organisations that have not been engaged in the community development space (FICCI–Accenture 2014). For the first time in India, CSR has become a concrete resource allocation platform backed by legislative support. The new law presents several opportunities for Indian companies to not only strengthen their CSR efforts but also shape India's economic future and their own global competitiveness (FICCI–Accenture 2014). The choices we make today are going to influence our generations to come. The inclusion of the CSR mandate is an attempt to supplement the government's efforts of equitably delivering the benefits of growth and to engage the corporate world with the country's development agenda (PWC 2013). This provision can make CSR a driver of capital formation in neglected areas of national interest as India is a fast-growing emerging economy but also faces numerous human development challenges. These include maternal health problems, infant mortality and intractable diseases such as malaria and tuberculosis (FICCI–Accenture 2014). Take maternal health for instance, India and Nigeria accounted for one third of global maternal deaths in 2013. An estimated 50 000 maternal deaths occurred in India in 2013. Although India has been able to substantively reduce its maternal mortality rate (MMR), India runs the risk of missing the MMR target set under the auspices of the Millennium Development Goals. While the government is launching extensive interventions, it is evident that more efforts need to be taken to achieve the desired MMR targets. The CSR Rules 2014 provide an opportunity to corporations to work with public agencies and help the nation achieve the desired MMR targets (FICCI–Accenture 2014).

CSR is the continuing commitment by business to contribute to economic development while improving the quality of life of the workforce and their families as well as of the community and society at large (WBCSD). The UNIDO defines CSR as a management concept whereby companies integrate social and environmental concerns in their business operations and interactions with their stakeholders. CSR is generally understood as being the way through which a company achieves a balance of economic, environmental and social imperatives ('triple-bottom-line approach'), while

addressing the expectations of shareholders and stakeholders. In this sense, it is important to draw a distinction between CSR, which can be a strategic business management concept, and charity, sponsorships or philanthropy. Even though the latter can also make a valuable contribution to poverty reduction, directly enhance the reputation of a company and strengthen its brand, the concept of CSR clearly goes beyond that (UNIDO). Today, CSR has become a worldwide concept whereby organisations consider the interests of society by taking responsibility for the impact of their activities on customers, employees, shareholders, communities and the environment in all aspects of their operations. It is one of the most important global issues with serious challenges and implications on almost all sectors. Surging economies, including India, are coping with issues related to poverty, child rights, community welfare etc. and are a hotbed for an innovative CSR Scenario, which is still shaping up (KPMG & ASSOCHAM 2008).

CSR – Global scenario

'India would become the first country to mandate corporate social responsibility (CSR) through a statutory provision', said Mr. Sachin Pilot, ex- Corporate Affairs Minister (KPMG 2014).

Social and economic initiatives, as a responsibility of the companies, are gaining popularity internationally. The Financial Reporting Council in the United Kingdom is in the process of introducing guidelines for disclosures regarding environmental, social and governance issues by a company. The intention is for these to replace the existing 'business review' section of annual reports, and companies would be required to provide complete disclosure about their business activities, including social efforts (Vaidyanathan & Thacker 2014). In India, the concept of CSR is governed by Section 135 of the *Companies Act, 2013*, which was passed on 29 August 2013. The CSR provisions within the act are applicable to companies with an annual turnover of Rs. 1000 crores and more, or a net worth of Rs. 500 crores and more, or a net profit of Rs. 5 crores and more. The act encourages companies to spend at least 2% of their average net profit of the previous 3 years on CSR activities, such as eradicating extreme hunger and poverty; promoting education; promoting gender equality and

empowering women; reducing child mortality and improving maternal health; combating human immunodeficiency virus (HIV), acquired immune deficiency syndrome (AIDS), malaria and other diseases; ensuring environmental sustainability; providing employment-enhancing vocational skills; funding social business projects; contributing to the Prime Minister's National Relief Fund or any other fund set up by the central government or the state governments for socio-economic development and relief and funds for the welfare of the scheduled castes, the scheduled tribes, other backward classes, minorities and women; and such other matters as may be prescribed (Grant Thornton).

Companies can also collaborate with each other for jointly undertaking CSR activities, provided that each of the companies are able to individually report on such projects (Bahl 2014). The new rules will be applicable from the fiscal year 2014–2015 onwards (PWC 2013). The act lists out a set of activities eligible under CSR (PWC 2013). The 2013 act stipulates that the company shall give preference to the local area and areas where it operates (Grant Thornton). The CSR activities should not be undertaken in the normal course of business and must be with respect to any of the activities mentioned in Schedule VII of the 2013 act. Contribution to any political party is not considered to be a CSR activity, and only activities in India would be considered for computing CSR expenditure (Bahl 2014). Also, activities meant exclusively for employees and their families will not qualify (PWC 2013).

CSR spending in India on various activities (before the new act)

The FICCI–Accenture Report conducted in-depth conversations with 30 senior leaders from companies and civil society organisations to understand the industry response to this changing CSR environment; this was complemented with a survey of 20 companies (FICCI–Accenture 2014). These discussions revealed the growing understanding within businesses towards leveraging CSR as a platform to initiate actions benefiting their business as well as the nation. Most large- and medium-sized companies are viewing CSR initiatives as their contribution to the developmental agenda

TABLE 1: CSR spending requirements.

Sr. No.	Country	Whether CSR spending/reporting mandatory
Countries not having mandatory guidelines for CSR spending/reporting		
1.	UK	Voluntary guidelines in place for CSR reporting
2.	USA	Voluntary reporting by companies in sustainability reports
3.	China	Voluntary reporting by companies in sustainability reports
4.	Germany	Voluntary reporting by companies in sustainability reports
5.	Australia	Voluntary reporting by companies in sustainability reports
Countries having mandatory guidelines for CSR spending/reporting		
1.	France	Mandatory reporting for listed companies in annual reports on CSR activities
2.	Denmark	Investors and state-owned companies to include information on CSR in their annual financial reports
3.	Sweden	Mandatory reporting by state-owned companies
4.	Indonesia	Natural resource-based companies must allocate budgets for CSR programmes and the programmes must be run according to government regulations
5.	Malaysia	Compulsory for companies listed on Bursa Malaysia to disclose their CSR activities or practices

Source: KPMG, 2014, 'CSR in India – A changing landscape', Report, March 2014.

TABLE 2: Sector-wise CSR expenditure, 2012–2013.

Industry	Health (%)	Education (%)	Community development/ rural development (%)	Environment (%)	Total (%)
Oil and gas	23.50	35.29	29.41	11.76	100
Automobile	40.00	10.00	40	10	100
Consumer durables	24.76	21.34	15.25	28.75	100
Iron and steel	35.29	23.53	35.29	5.88	100
Banking and financial services	8.57	20.00	48.57	35	100
Power	10.00	10.00	45	35	100
Infrastructure	8.35	30.55	44.44	16.66	100
Cement	22.20	25.00	29	23.8	100
Paper and pulp	19.90	24.10	18	38	100
Pharmaceutical	30.00	28.00	22.00	20.00	100

Source: Bansal, S. & Rai, S., 2014, 'An analysis of corporate social responsibility expenditure in India', *Economic Political Weekly* XLIX.

Note: Calculated from the annual reports of the top 200 firms for the year 2012–2013.

of the society, rather than simply as efforts that grant them a 'license to operate' (FICCI–Accenture 2014).

A study of the CSR activities undertaken by the top 200 firms in the year 2012–2013 across 10 industries attempts to get an industry-level analysis of the nature of these activities (Bansal & Rai 2014).

Most of the firms undertake CSR expenditure for the welfare of the rural communities (Table 2), especially around their areas of operation. A possible reason could be to generate goodwill amongst people in the neighbourhood and become familiar with the area and its needs, which, in turn, would minimise costs of providing services. Contrary to the developed countries where CSR activities are undertaken mainly in the area of environment, in India it is mainly undertaken in the social sector (Bansal & Rai 2014). In the light of the recent legislation, it would be interesting to see how companies would change their CSR strategies. After community development, education (including skill development) attracts the largest share of CSR expenditure. Health is also a major area where firms like to invest (Bansal & Rai 2014).

Implications of *Companies Act, 2013* (CSR)

An increasing number of businesses, high-net-worth individuals and mid-tier professionals want to contribute to societal growth through active engagement. These organisations and individuals have significant resources and experience and are no longer interested in 'cheque philanthropy'. They

are ready to play a far more active role in shaping growth trajectories of institutions and accelerating social change (FICCI–Accenture 2014).

According to the Indian Institute of Corporate Affairs (IICA), about Rs. 200 billion (roughly US\$ 3.2 billion) could be unlocked from a pool of around 16 000 companies for CSR spending during 2014–2015 (FICCI–Accenture 2014). CSR initiatives in Indian companies stand to benefit tremendously, thanks to significantly more predictable spending (FICCI–Accenture 2014) (see Table 3).

Companies allocating percentage of their PAT each year for CSR activities: Businesses capitalise on natural, social, human and economic resources to have the long-term perspective such that future is sustainable and stable. They need to make sustainability a core driver of their strategy. The real challenge, however, lies in the widespread adoption of these initiatives. The '*Business Responsibility: India Survey, 2013*' helps to understand where the initiatives stood before the implementation of the new act (India Survey 2013). The surveyed companies include the top 200 companies by market capitalisation, and the survey was conducted using a questionnaire technique (India Survey 2013).

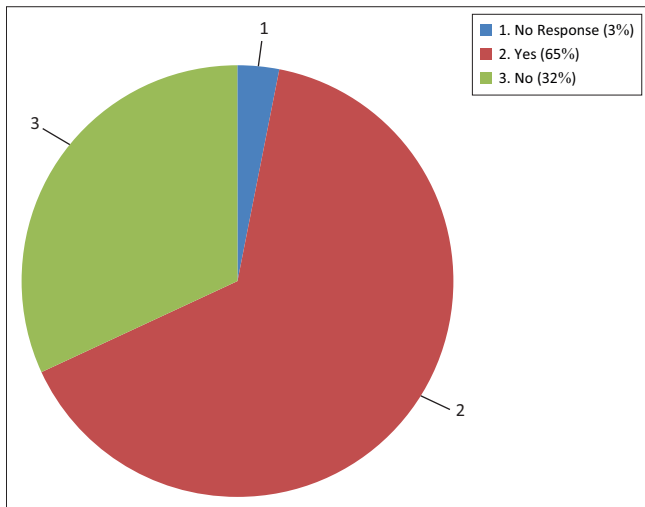
Sixty-five per cent of the respondents claim to allocate a certain percentage of their PAT each year for CSR activities (Figure 1). Of these, about 25% companies commit at least 2% of their PAT on CSR activities. About the same percentage of companies claims to spend up to 2%. Almost 12% companies suggest that their CSR budget varies between years and are dependent on projects (India Survey 2013).

Expected increase in CSR expenditure and reporting: *Forbes India* survey realised that many firms, even among the top 100 firms by revenue (FY 2012), do not report their CSR expenditure or even declare the social causes they support, as they are not required to do so by law. But all this will change now that the new *Companies Act, 2013*, requires formal reporting of CSR efforts by corporates. The data pack, compiled by CSRidentity.com, together with *Forbes India*, tells you how much each company will have to fork out on CSR, once they are bound by law (Jayashankar, Paul & Bhat 2013).

TABLE 3: CSR budget in India.

CSR budget (Rs. millions)	Number of companies
Up to Rs. 5	13 346
Rs. 5–10	1196
Rs. 10–50	1186
Rs. 50–100	182
Rs. 100–200	79
Rs. 200–500	43
Rs. 500 or more	25

Source: FICCI Accenture Report, 2014, *Organizing for success on corporate responsibility: The path to high performance Grant Thornton: Implications of Companies Act, 2013 corporate social responsibility*.



Source: India Survey, 2013, Business Responsibility: India Survey, 2013, from http://www.sustainabledevelopment.in/pdf/whatwethink/Business_Responsibility_India_Survey_2013.pdf.

FIGURE 1: Companies allocating percentage of their PAT each year for CSR activities out of 200 surveyed companies.

Implementation of the act

The CSR regime complements the efforts of the government and non-government organisations by requiring companies in India to initiate activities for the economic wellbeing of the underprivileged and for the environment. Companies can also join hands to undertake CSR projects (Vaidyanathan & Thacker 2014). Experts say that these companies should outsource the CSR activities to civil society sector instead of creating an army of people for carrying out the CSR activities. They should allow not for profit companies to actually execute the programme at the ground level (*Business Standard* 2015).

When a company chooses an initiative that fits its values and purpose, it should commit managerial talent to the chosen problem, and should address it just as it would do in a business situation (Kasturi Rangan 2014). A company should carefully choose the activities where it can bring its resources and competence to play. An engineering company is likely to have better skills at addressing problems of lack of sanitation, a software company might have better skills at addressing education and a consumer goods company would be better at addressing public health and hygiene issues (Kasturi Rangan 2014). Every company should attempt to move the needle on the social or environmental problem it undertakes. Big companies, by bringing their technical and organisational skills to bear, not just money, should attempt to uplift the capability of their social value chain partners (this often will be the local government) and make a real dent on the problem. Analysis of CSR activities of top 100 companies shows that the mode of giving has primarily been through non-government organisations and other social organisations as around 90% (Figure 2) companies are channelling their funds through them (FICCI–Accenture 2014). While majority of companies have established in-house foundations to engage in social activities, around 10% of the organisations choose to design and execute activities directly through them.

Conclusion

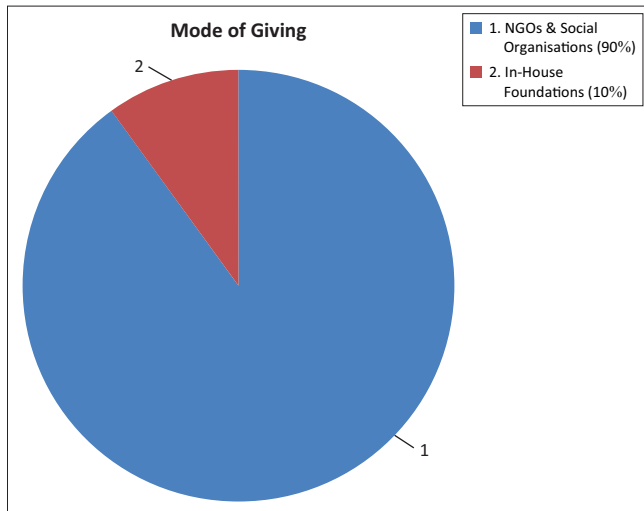
A robust and thriving development sector is central to India's quest for equitable, inclusive and sustainable growth (PWC 2013). The Indian *Companies Act, 2013*, marks a paradigm shift in India's corporate law regime and has far-reaching implications for both domestic companies and overseas investors with a presence in India (Shroff 2014). India's development sector

TABLE 4: Excerpt of spending on CSR by top 100 companies.

Sr. No.	Company	Revenue (FY 2012)	Avgas PAT	Actual spend	2% of PAT
1.	Indian Oil Corporation (IOC)	442 459	7783	83	156
2.	Reliance Industries	368 571	21 138	288	423
3.	Bharat Petroleum Corporation	223 315	1438	8	29
4.	Hindustan Petroleum Corporation	195 891	1118	27	22
5.	Tata Motors	170 678	8437	15	169
6.	Oil & Natural Gas Corporation (ONGC)	151 121	23 660	121	473
7.	State Bank of India (SBI)	147 197	13 056	71	261
8.	Tata Steel	135 976	3895	146	78
9.	PNB GILTS	104 628	29	NA	1
10.	Hindalco Industries	82 549	3597	28	72
11.	Coal India	78 410	11 759	119	235
12.	Bharti Airtel	71 506	6511	33	130
13.	MMTC	67 023	129	3	3
14.	NTPC	66 366	9334	49	187
15.	Larsen & Toubro	64 960	4818	70	96
16.	Essar Oil	63 428	-201	NA	N/A
17.	Mahindra & Mahindra	63 030	2948	22	59
18.	Mangalore Refinery & Petrochemicals	57 214	1066	NA	21
19.	Tata Consultancy Services (TCS)	48 894	8935	51	179
20.	Bharat Heavy Electricals	50 654	5823	37	116
Total			(100)	1765	5611

Source: Jayashankar, M., Paul, C. & Bhat, S., 2013, 'CSR report card: Where companies stand', *Forbes India*, March 18, 2013.

Note: Companies are ranked on basis of revenue. Revenue figures are indicative of the company's financial performance in financial year 2011–2012 (FY12) only. All figures are in Rs Crore and have been rounded off to the nearest decimal point. Avgas PAT refers to the average of profit after tax recorded by a company in the last three financial years (FY10, FY11 and FY12). NA stands for data 'not available' for companies which do not disclose their CSR spends in their annual reports. 2% of PAT refers to the amount that a company needs to spend in CSR activities as per the government mandate. N/A implies not applicable; according to government policy, loss-making firms do not need to invest in CSR.



Source: FICCI Accenture Report, 2014, *Organizing for success on corporate responsibility: The path to high performance Grant Thornton: Implications of companies Act, 2013 corporate social responsibility*.

FIGURE 2: Mode of Spending on CSR by 100 surveyed companies.

has evolved substantially over the last few decades and is now witnessing unprecedented interest and investments across the value chain (PWC 2013). The corporates have responded positively to the reform measure undertaken by the government. The practice of CSR is not new to companies in India. However, this act brings more companies into the fold. Also, it is likely that the total CSR spending will increase. What is clear to many companies is that if this increased spending is to achieve results on the ground – which is the intent of the act – then it needs to be done strategically, systematically and thoughtfully (PWC 2013). The resulting flow of funding will position companies to help address India's most pressing societal challenges. Equally exciting is how the corporate responsibility (CR) initiatives that companies launch will generate forms of value that matter to businesses. Examples include development of new sources of talent, improved infrastructure in the local communities where companies are operating and entry into new markets for innovative products or services developed for CR purposes. Businesses that can capture such value from their CR efforts and use it to drive new growth will play a major role in shaping India's economic future (FICCI–Accenture 2014).

The India Survey suggests that many companies are already spending 2% or more on CSR as per the benchmark set in the *Companies Act, 2013*. However, experience in the space suggests that for many of these large corporations, this percentage figure becomes very large in absolute number and companies find it difficult to exhaust their budget stipulated for CSR activities completely if areas and methods

of spending are restricted. India faces many challenges that require innovative ways of solving them, strengthening or creation of new institutions, research and debate, and on ground action (India Survey 2013). The CSR mandate could be an opportunity for corporates to move away from a narrow vision of CSR to a broader vision of corporate responsibility comprising actions that will help create a people- and planet-friendly business environment, enabling generation of socially responsible profits. An all-encompassing holistic view of corporate responsibility will usher in innovations, collaborations and organisational transitions that will make corporations commercially and socially viable in future (FICCI–Accenture 2014). Clearly, all this will involve considerable change – both within and outside a business's walls. But the upfront investment will be well worth it. By adopting a disciplined approach to making the necessary changes, companies can make an unprecedented contribution to India's future (FICCI–Accenture 2014).

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Competing interests

The authors declare that they have no financial or personal relationship(s) that may have inappropriately influenced them in writing this article.

Authors' contributions

A.M. (University of Delhi) and A.J. (University of Delhi) contributed equally to the writing of this article.

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The pricing of inflation and exchange rate risks on the South African socially responsible investment index: An application of the APT model

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Owing to the systematic forces inherently present in all equity markets, investors require a premium for bearing any portion of risk when investing in stock markets. As such, the pricing of certain macroeconomic variables and the behaviour of asset returns are major concerns for investors and financial practitioners alike. The exchange rate and inflation rate are amongst the risk factors that affect different indices of the South African stock market. One of the stock market indices that can be affected by these risks is the growing socially responsible investment (SRI). This research made use of a three-factor arbitrage pricing theory (APT) model to investigate the exposure of the South African SRI index to exchange rate and inflation rate risks. The sample period consists of 104 monthly observations from January 2006 to August 2014 and the 38 companies that have been part of the SRI index during this period. Findings of the study showed that the results of conditional and unconditional asset pricing models differed, and the conditional model produced reliable results. The inflation and market risks were found to be priced in the SRI index, but there was no evidence supporting the pricing of the exchange rate risk in this index. The study therefore concluded that the exchange rate risk is diversifiable in the SRI index, whilst inflation risk is not.

Introduction

Stock return is normally exposed to different risk factors related to systematic and unsystematic forces. Owing to the systematic forces inherently present in all equity markets, investors require a premium for bearing a portion of risk when investing in stock markets. As such, the pricing of certain macroeconomic factors and the behaviour of asset returns are major concerns for investors and financial practitioners alike. An important part in investing is determining whether a risk premium accompanying a risk factor is statistically significant. With the formation of the socially responsible investment (SRI) index in 2004, an array of opportunities has been created for investors interested in socially responsible investing. Socially responsible investing is defined as an investment strategy that takes into account societal and/or environmental benefits when making financial investment decisions (JSE 2004). Socially conscious investors, like many other investors, are primarily concerned with systematic or non-diversifiable risks linked to investing in the SRI index.

The SRI consists of companies that aim to attain a high environmental, social and governance (ESG) rating by following investment strategies such as screening, shareholder activism and cause-based investing (JSE 2004). The above-mentioned investment strategies create a substantial sector and economic bias (Kutz & DiBartolomeo 1996). The SRI is a sub-index of the Johannesburg Stock Exchange (JSE), and it has been associated with certain macroeconomic factors (Muzindutsi & Sekhampu 2013). However, it is not clear which macroeconomic variables are priced in the SRI index. Other key macroeconomic factors that tend to affect several stock market indices include the exchange rate and inflation risk factors (Jorion 1991). Hence, this warrants further investigation as to whether socially responsible investors require a risk premium on being exposed to exchange rate and inflation risk factors.

In assessing the pricing risk factors in the stock market index, the arbitrage pricing theory (APT) is utilised in the study. The APT model is a multifactor model that relates the expected returns associated with each risk factor and describes the variations on a cross-sectional basis (Szczygielski 2013). APT, as a model, has greater explanatory powers than previous pricing models such as the Capital Asset Pricing Model (CAPM) because it gives allowance to more than one risk factor and allows the construction of factors that best fit the data (Fama & MacBeth 1973). The APT asserts that stock returns are a linear function of multiple macroeconomic factors (Chawana 2011). In the APT model, the risk premium is defined as the slope coefficient in the linear relation between

the expected returns and their covariance (Huberman & Wang 2005). APT has been used to establish how various macroeconomic factors are priced in the whole market index, such as JSE All Share Index or within a specific index, such as the industry-based index. However, in a screened index, such as SRI index, the pricing of certain factors may differ from that of conventional indices because of the screening process that companies are required to undergo every year (Kutz & DiBartolomeo 1999).

The South African SRI index was launched by the JSE in May 2004, and it was the first of its kind in an emerging market. The index has developed in recent years as a vigorous and rapidly growing segment of the JSE (2014). The JSE SRI index was created because of the immense interest shown by investors and money managers who were looking for greener investment opportunities (Herringer, Firer & Viviers 2009), and it has become an essential investment style within the South African investment community (Brzeszczy ski & McIntosh 2014). Companies in the SRI index go through a screening process to determine whether they comply with the social responsible requirements, implying that the SRI index tends to have different characteristics that might predispose different asset return behaviour (Nguyen 2010). Thus, a further analysis of the application of APT in determining whether certain macroeconomic factors are priced in the SRI index may shed more light that can enhance their investment decisions. Thus, the study makes use of the APT to assess the pricing of selected pre-specified macroeconomic factors, namely inflation rate risk and exchange rate risk, in the SRI index.

Literature review

The application of the APT model in analysing the pricing of macroeconomic factors in the stock market index should make use of pre-specified risk factors, to attain a more meaningful analysis (Berry, Burmeister & McElroy 1988; Chen, Roll & Ross 1986; Conway & Reinganum 1988). For the output of the APT to have a more meaningful economic interpretation, pre-specified macroeconomic factors should be regarded as legitimate by meeting a number of characteristics (Azeez & Yonezawa 2006; Berry *et al.* 1988). Firstly, the factor must be entirely unpredictable to the market; secondly, the factor must have an inescapable influence on stock market returns; and lastly, the factor must influence expected stock market returns or have a non-zero impact on stocks market prices (Berry *et al.* 1988). Thus, there must be a definite change in stock market prices because of the unexpected change in the pre-specified risk factor. This suggests that stock market prices are predominantly influenced by economic news linked to a wide array of unanticipated events that have an inescapable effect on stock market prices. Stock market price behaviours are therefore linked to observed macroeconomic factors driven by unanticipated macroeconomic events (Azeez & Yonezawa 2006). The effect of such macroeconomic factors may differ from one stock market index to another and some factors may be priced in the stock market index, whilst other may not. In the context of the study, inflation and exchange factors are tested to indicate if they are priced or not within the SRI.

Inflation rate as a risk factor in the stock market index

The central motivation to selecting inflation rate risk is the Fisher effect, which links nominal stock prices to corresponding changes to inflation, as well as highlights the positive statistical relationship between these two variables (Al-Khazali & Pyun 2004). The Fisher effect states that shares are in essence a hedge against inflation risk, which is because of the fact that share returns are said to have a positive return that compensates for the loss in purchasing power caused by inflation rate risk (Correia & Wormald 1988). Stocks are therefore believed to have inflation hedge characteristics (Elton, Gruber & Rentzler 1983). For example, Arjoon *et al.* (2012) maintained that because of the long-run relationship between inflation rate risk and real stock prices, investing in real stocks could in essence provide a hedge against inflation rate risk. However, the type of inflation to be used in the APT model is still controversial. Correia and Wormald (1988) supported the notion that APT as a model only took into consideration inflation rate as a risk factor only if there was an unexpected change in inflation. However, Hamao (1988) contended that an expected inflation rate rather than unexpected inflation rate has a more consistent explanatory power with regard to share returns. The fundamental theories of risk stipulates that unexpected changes in macroeconomic factor are legitimate risk factors (Berry *et al.* 1988) as any expected changes could not be considered as a risk because it can be hedged or avoided by investors. The study therefore makes use of unexpected changes to inflation.

On an empirical standpoint, Azeez and Yonezawa (2006) examined the pricing of inflation rate risk within the Japanese stock market using the APT model and found that inflation risk was adequately priced. Reese (1993) stated that the APT identified unexpected changes in the macroeconomic factors as risk factor loadings that should be tested. However, an empirical investigation of the APT model by Hamao (1988) in the Asian stock market indicated that fluctuations in the expected inflation rate along with unexpected fluctuations in the risk premium significantly affected Asian stock returns. In the context of South African SRI index, Muzindutsi and Sekhampu (2013) found that the short-run relationship between inflation and the SRI index was not significant, whilst it became significant in the long run. This suggests that there may be a link between inflation and the SRI index returns but it is not clear whether this factor is priced in the South African SRI index. Thus, a further analysis with an application of the APT will identify whether South African socially responsible investors require risk premium for being exposed to inflation rate risk.

Exchange rate risk as a risk factor in the stock market index

Exchange rate exposure amongst firms varies from firm to firm in relation to how it affects the value of the firm. In essence, because of increasing globalisation, not only

firms that deal with the import and export of goods and services but also firms that operate solely within a country are affected by adverse exchange rate movements (Adler & Dumas 1984; Muzindutsi & Nyimbanira 2012), which thus makes exchange rate a major macroeconomic concern for all investors, as exchange rate fluctuations impact not only the cash flow of a company's operations but also variations in the discount rate utilised to value these cash flows (Barr, Kantor & Holdsworth 2007). Thus, investors are primarily concerned with unanticipated fluctuations to the exchange rate as this unexpectedly affects share prices. The pricing of exchange rate risk within the emerging markets is both statistically and theoretically proven to be significant (Abdalla & Murinde 1997). Because of the fact that the SRI is a sub-sector of the JSE, it stands to reason that it is also affected by the exchange rate risk. Muzindutsi and Sekhampu (2013) found that a long-run relationship existed between the JSE SRI index and real exchange rate risk, but it did not suggest that real exchange rate risk is priced in the SRI index. Although some studies (Jorion & Giovannini 1989; Muzindutsi & Niyimbanira 2012; Reese 1993) found exchange rate risk to be priced in the stock market, others found that the exchange rate was not statistically and economically significant in explaining the expected stock market returns (Dominguez & Tesar 2001; Hamao 1988; Jorion 1991; Khoo 1994). This shows that the pricing of the exchange rate in the stock market index may vary from stock market to stock market or sector/index to sector/index. Thus, it is important to test whether exchange rate risk is priced within a screened index such as the JSE SRI index.

Methodology

Data

The data include actively traded stocks from the JSE, which have been present in the JSE SRI index for the 2006–2014 period. This period was chosen simply to ensure that the selected companies have maintained high performance in SRI activities for the past 9 years. The sample size consists of 38 companies with 104 monthly observations for each company. Data on each individual company were obtained from the McGregor Bureau of Financial Analysis (BFA) database, and the inflation rate and real effective exchange rate were obtained from South African Reserve Bank. Unexpected changes in both inflation rate and real effective exchange rate were used as Berry *et al.* (1988) suggested that the factors chosen for APT model must constitute unexpected movements at the beginning of the selected period and should be uncorrelated over time.

Model specifications

The study used a multifactor APT model to test the pricing of the inflation rate and the exchange rate in the JSE SRI index. A factor in the APT is priced when there is a risk premium aligned with such risk factor of the asset (Jecheche 2012). The risk premium can be identified through the use of a two-pass

regression model, which is extensively used in the literature (Chen 1983; Roll & Ross 1980). This involves the use of the first-pass regression to estimate risk factors (betas) and the second-pass regression, which uses these betas to estimate risk premium attached to each risk factor. The first-pass regression, which was used to estimate the market, inflation and exchange rate betas for each company in the SRI index, is as follows:

$$R_{it} = r_{0t} + \beta_m R_{mt} + \beta_{INFL} INFL_t + \beta_{ER} ER_t + e_{it} \quad (1)$$

where R_{it} is the return for a company i at time t , R_{mt} is the rate of return on the market at time t , $INFL_t$ and ER_t are unexpected movement in inflation and exchange rate at time t , respectively, r_{0t} is the risk-free rate, β_m is market risk, β_{INFL} and β_{ER} are inflation risk and exchange risk, respectively, and e_{it} is the error term. The second-pass regression, which was used to estimate the risk premium of betas from Equation 1, is as follows:

$$RP_i = r_{0i} + \beta_m \beta_{mi} + \beta_{INFL} \beta_{INFLi} + \beta_{ER} \beta_{ERi} + u_i \quad (2)$$

where RP_i is the risk premium for a company i ($R_i - R_f$); r_{0i} is the intercept, which can also be the risk-free rate; β_m is the market risk premium; β_m is market risk; β_{INFL} is the inflation risk premium; β_{ER} is the exchange rate risk premium; β_{INFL} and β_{ER} are inflation risk and exchange rate risk, respectively; and u_i is the error term. If β_{INFL} and β_{ER} are statistically significant, it means that inflation and exchange rate risks are priced in the SRI index. After estimating the model on each stage, the methodological issues related to the econometric model were checked to ensure that all the necessary ordinary least squares (OLS) assumptions are met. Thus, diagnostic tests were conducted to ensure that there was no presence of heteroscedasticity, autocorrelation and multicollinearity.

Results

Before conducting any estimation, the correlation analysis was conducted to check whether independent variables were not highly correlated, as an incidence of extensive correlation in explanatory variables may lead to the presence of multicollinearity (Jorion 1991; Salvatore & Sarmiento 1983). Pearson correlation coefficients, shown in Table 1, are very low and not statically significant at the 5% level of significance (p -values < 0.5), and this indicates that there is no correlation between the independent variables, which suggests that there is no presence of multicollinearity. The next was to use the first-pass regression (Equation 1) to estimate betas (coefficients) for each factor. These betas were

TABLE 1: Pearson correlation between independent variables.

Variables	Rm	ER	INFL
Rm	1	-	-
ER	-0.178 (0.073)	1	-
INFL	0.049 (0.621)	-0.034 (0.735)	1

p -values are given in parentheses.

then used as inputs for the second-pass regression and are not reported in this paper.

Using the betas (coefficients) from the first-pass regression, the risk premium of each factor was estimated by making use of the second-pass regression (Equation 2). The estimation of risk premium followed both conditional and unconditional APT models. Firstly, unconditional APT that used endogenous risk-free rate (intercept) was estimated, and its results were compared with those of conditional APT with exogenous risk-free rate or predetermined intercept to identify a better model. Results of both models are presented in Tables 2–3.

Table 2 shows the estimates of the unconditional model (with endogenous intercept/risk-free rate). The coefficient for the market risk premium is positive but is not statistically significant, even at the 10% level of significance, which means that there is no unconditional market premium in the SRI index. The coefficient for inflation risk premium is statically significant at the 5% level of significance (p -value < 0.5), meaning that the unconditional inflation risk premium is different from 0. Thus, inflation risk is associated with an unconditional risk premium of 2.4593% per month, but it has a negative sign (which is unexpected). The exchange rate risk premium is not statistically significant and has a negative sign, which is unexpected. The R^2 of 0.180243, which is statistically significant at the 10% level of significance (probability of F -statistic < 0.1), means that all independent variables jointly explain about 18.02% of the returns of the SRI companies. The Durbin-Watson stat of 1.9359 is close to 2, suggesting that there is no first-order autocorrelation amongst the residuals. Further residuals diagnostic tests (Breusch-Godfrey Serial Correlation LM tests and Breusch-Pagan-Godfrey Heteroskedasticity) also confirm that there was no presence of serial correlation and heteroscedasticity (p -values > 0.1) in the results of the unconditional APT model.

The results of conditional second-pass regression, as can be seen in in Table 3, show that market risk premium and inflation risk premium are statically significant at the 1%

level of significance (p -values < 0.01) and have a positive sign, which is correct/expected. The monthly risk premia for market and inflation are 0.812% and 1.934, respectively. Similar to the results of the unconditional model, the exchange rate risk premium is not statically significant (p -values > 0.1) in the conditional model, but it has the expected positive. Breusch-Godfrey Serial Correlation LM Test and Breusch-Pagan-Godfrey Heteroskedasticity Test show that there is no autocorrelation nor is there heteroscedasticity (p -values > 0.1) in the conditional model. Comparing the two models, the conditional model produced expected signs for all coefficients and has higher R^2 and adjusted R^2 , implying that it produced better results than unconditional model. Thus, the risk premium estimated by the conditional model is discussed.

Discussion

The application of the three-factor APT model showed that socially responsible investors seem to attach risk premium to market and inflation factors, whilst there was no evidence of exchange rate risk premium. The selection of the model showed that the conditional APT outperformed the unconditional one, implying that the methodology used to determine risk premium tends to affect the results. The finding concurs with other studies (Carrieri & Majerbi 2006; Doukas, Hall & Lang 1999; Dumas & Solnik 1995) that insist that the results of conditional and unconditional asset pricing models tend to differ. Results of the study showed that returns in the SRI index seem to be associated with conditional risk premium, and this is consistent with the study of Jorion (1985), which states that macroeconomic factors in the APT models are characterised by conditional risk premium. Beside the market risk premium, socially responsible investor seems to attach a premium to exposure of the inflation risk, which implies that inflation risk is priced in the SRI index. The finding is in line with other studies (Al-Khazali & Pyun 2004; Azeez & Yasuhiro 2006; Hamao 1988), which found that inflation rate risk was adequately priced in the different stock market index. Thus, inflation risk is not a diversifiable risk in the SRI index.

Although the exchange has been found to be a significant risk factor in the South African stock market (Barr *et al.* 2007; Muzindutsi & Niyimbanira 2012; Reese 1993), there appears to be no premium attached to the exchange rate risk in the SRI index. The exchange rate risk is therefore not priced in this index, and this is also contrary to other findings (Carrieri & Majerbi 2006; Doukas *et al.* 1999; Muller & Verschoor 2006) from other emerging stock markets. However, the finding is in line with studies (Dominguez & Tesar 2001; Hamao 1988; Jorion 1991; Khoo 1994) that found that there was no premium attached to the exchange rate risk. The plausible explanation behind this finding is that exchange rate exposure varies between firms of the SRI index, as some firms in the index tend to suffer from depreciation/appreciation of the rand, whilst other firms benefit from depreciation/appreciation of the rand. Consequently, the exchange rate risk seems to be diversified in the SRI index.

TABLE 2: Second-pass unconditional regression results.

Variable	Coefficients	SE	t-Stat	P-value	Regression statistics
λ_0	0.00882	0.00343	2.57095	0.0147	R^2 0.180243
λ_m	0.00017	0.00343	0.05008	0.9603	F -statistic 2.49189
λ_{INFL}	-0.02459	0.01015	-2.4231	0.0209	Prob (F -statistic) 0.0767
λ_{ER}	-0.00041	0.00408	-0.10094	0.9202	Durbin-Watson stat 1.9359

Unconditional model: $RP_t = \lambda_0 + \lambda_m \beta_{m,t} + \lambda_{INFL} \beta_{INFL,t} + \lambda_{ER} \beta_{ER,t} + u_t$.
Breusch-Godfrey Serial Correlation LM Test: F -statistic = 0.728852; Prob. = 0.4903.
Breusch-Pagan-Godfrey Heteroskedasticity Test: F -statistic = 1.581562; Prob. = 0.2118.

TABLE 3: Second-pass conditional regression results.

Variable	Coefficients	SE	t-Stat	P-value	Regression statistics
λ_m	0.00812	0.00161	5.043131	0.0000	R^2 0.19562
λ_{INFL}	0.01934	0.02775	4.30051	0.0001	Durbin-Watson stat 2.1424
λ_{ER}	0.00597	0.00372	1.60281	0.1180	

Conditional model: $RP_t = \lambda_0 + \lambda_m \beta_{m,t} + \lambda_{INFL} \beta_{INFL,t} + \lambda_{ER} \beta_{ER,t} + u_t$ (with exogenous risk-free rate).
Breusch-Godfrey Serial Correlation LM Test: F -statistic = 0.27478; Prob. = 0.7614.
Breusch-Pagan-Godfrey Heteroskedasticity Test: F -statistic = 1.4449; Prob. = 0.2469.

Conclusion

The study examined the APT and its efficiency and adequacy in pricing stock market returns within the South African SRI index. Given that the theory itself does not provide a set of macroeconomic variables, the study used a set of pre-specified macroeconomic variables, namely inflation rate risk and exchange rate risk, which substantiates this selection with economic theory. The selection of the model showed that the results of conditional and unconditional asset pricing models differed, and the conditional model produced reliable results. The South African SRI index is exposed to market and inflation risks, but there was no evidence supporting the exchange rate exposure in the SRI index. Thus, the exchange rate risk is diversifiable in the SRI index, implying that investors of SRI index do not attach premium to the exchange rate risk. However, South African socially responsible investors seem to attach risk premium to market and inflation risks. Thus, these investors should consider the impact of inflation rate movements on both the cash flow of companies' operations and the discount rate employed to value such cash flows when investing in SRI companies.

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Competing interests

The authors declare that they have no financial or personal relationship(s) that may have inappropriately influenced them in writing this article.

Authors' contributions

Both authors M.F. (North-West University) and P.F.M. (North-West University) contributed academic input to the study and in the writing of the article.

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The relationship between head of household characteristics and child deprivation in a South African township

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Children all over, particularly in the developing world, are increasingly becoming more and more vulnerable as the poverty rate at the household-level remains high. Children's circumstances are to a great extent dependent on the circumstances of the head of the household. Head of household characteristics, such as employment status, education level, gender, marital status and age among other things, have a direct impact on the children in the household. The paper looks at the relationship between the head of household characteristics and child welfare in the household. The paper uses data collected from households in Boipatong Township in 2013. A child deprivation index was used as a measure of child welfare in the household. A number of questions were used to measure the level of child deprivation. Based on the responses, an index was calculated. An Ordinary Least Squares regression was used to determine the household head characteristics that significantly affect child deprivation. Results from the regression analysis show that there is a significant negative relationship between income and child deprivation. In the sample, the parameter 'age of the head of household' shows that the children are less deprived when the parent in the household is older. The results further show that children from families where the parents are married or living together are less deprived than those from single-parent households. Employment status was also found to be an important attribute. The formally employed parents reduced the likelihood of children being deprived as opposed to the unemployed parents whose children were more likely to be deprived.

Introduction

Individuals can be deprived because of a shortage of resources of all types, not just financial, and deprivation may possibly be defined in an extensive way to cover a wide range of facets of a person's living conditions. Deprivations are incoherently viewed as undesirable and unsatisfactory conditions, emotional, material, behavioural or physical, as documented by means of a fair-minded degree of social consent. Deprivations include a lack to some degree commonly believed as necessary, a sufficient income, good well-being, etc. (Gordon *et al.* 2003:6). Children are increasingly becoming more and more vulnerable as the poverty rate on household level remains high. Children's circumstances are to a great extent dependent on the circumstances of the head of household. Head of household characteristics such as employment status, education level, gender, marital status and age among other things have a direct impact on the children in the household. The paper looks at the relationship between the head of household characteristics and child welfare in the household. The paper uses data collected from households in Boipatong in 2013. A Child Deprivation Index was used as a measure of child welfare in the household. A number of questions were used to measure the level of child deprivation. Based on the responses, an index was calculated. An Ordinary Least Squares (OLS) regression was used to determine the household head characteristics that significantly affect the deprivation index. The rest of the paper is organised as follows: the second section presents a literature review on deprivation and head of household characteristics to be considered as determinants of child deprivation in the regression analysis. The third section presents the methodology followed and the fourth section presents results and discussion. The conclusion is presented in the fifth section.

Literature review

A child is said to be in poverty when they experiences deprivation of fundamental aspect that are essential to their most basic well-being. These elements may include material items, spiritual wellness and emotional wellness that are crucial to their existence. In the absence of these fundamentals, a child's wellbeing is compromised and is unable to take a stand as a valued member of society. There is a pressing need to study child poverty and deprivation for the simple

reason that child poverty differs from poverty experienced by adults, and the poverty experienced as a child may have lasting consequences right through to the adult stages of life (Bárcena, Blázquez, Budría & Moro 2014), (Singh & Sarkar 2014). It is pertinent to define deprivation to distinguish it from poverty in general and to have a clear understanding of its meaning and how it is applied to child poverty. Townsend (1987:5) in Gordon and Nandy (2012) defined deprivation as 'a state of observable and demonstrable disadvantage relative to the local community, society or nation in which the deprived individual or family exists'. Gordon and Nandy (2012) further points out that the deprivation idea has been applied to physical and emotional conditions rather than resources and to specific and not only general circumstances, and therefore can be distinguished from the concept of poverty (Gordan & Nandy 2012). Deprivation has numerous aspects to it. A child raised in a household that is educationally and culturally uninspiring is paralysed by environmental scarcity, a child who is rejected and unloved by their guardian experiences emotional deprivation and a child who resides in residential care permanently or for lengthy times is deprived of regular home life. Children deprived of a regular home life can be disadvantaged in several ways: they could be deprived of good nutrition, healthiness, social contact with adults or other children, affection, playing facilities, etc. (van der Ross 2010), (Kellmer-Pringle 2002).

Deprivation can also be viewed from both monetary and a non-monetary perspectives. Children can experience both forms of deprivation at some point in their lives. A study by Ridge (2009) showed that children were exposed to social exclusion because of the fact that they did not have the financial resources necessary to 'fit in' with their peers. Some of the children suffered severe stigmatisation and bullying because they were financially deprived. Children deprived of activities that entailed financial investments were often exposed to youth crimes that could be prevented. With regards to non-monetary deprivation, the emotional aspects of deprivation are considered. Although emotions cannot be measured or weighed, one can seek to determine the effects of going without certain needs or wants on a child's emotional wellness. These can be because of loss of parents who used to provide for those needs. Family responsibility put on a child, especially in child-headed households, can also contribute to multidimensional deprivation for a child because they are deprived of their time to attend school (UNICEF 2011).

Head of household characteristics and child deprivation:

There are a number of household characteristics, particularly the head of household characteristics, that determine the probability of a child being deprived or not. Some of the head of household characteristics include employment status, age, education level, marital status and gender. Other general household characteristics that are not necessarily borne by the head of the household but are crucial to the welfare of children in the household may include size of the household and household income. With regards to marital status, single-headed households have a significant bearing on a child's susceptibility to deprivation. A study in the

United States suggested that child poverty has long been prevalent amongst female-headed households (Rector 2012). A child growing up in a female-headed household is exposed to deprivation in that in most cases the household has fewer resources. Most children in female-headed households are either born out of wedlock or the parents are not together anymore. However, most Northern European countries are known to have lower rates of child poverty and child bearing out of wedlock than in the United States (Heuveline & Weinshenker 2008:175). Rector (2012) also reported that in the United States, marriage reduces the probability of a child being poor by 76%. The female-headed households in South Africa also tend to be more susceptible to poverty and hence child deprivation. Makhallima, Sekatane and Dunga (2014) found that the probability of a child being poor was higher in female-headed households as opposed to male-headed households.

Child deprivation can also be triggered by parental unemployment and low levels of education. Unemployed parents with low levels of education are often overwhelmed with emotional frustration because they are in most cases unable to provide for the financial needs of the household and the children. The financial hardships also make it difficult for parents to financially invest for the future of their children, and this may lead to stress and anxiety (Mountney & Reid 2012:3). A child is therefore deprived on multiple levels in such a household. First, there is lack of financial support, and second, the frustration in the parent results in less emotional support and hope for the future. The lower educational achievement of the head of household may also act as a demotivation for the child to work hard in school. According to a study by Dunga (2012), children in households where the parents have lower levels of education are less likely to achieve in school. Household size can also be a contributing factor to child poverty and deprivation. From a poverty perspective, a large household may have to prioritise essential needs, such as food, which will ultimately lead to sacrificing of other goods. In this case, it would mean that a child or children in the household may have to go without certain recreational items that may contribute to their development. A large household living in a small house can affect the outcomes of a child in school, which is particularly so because the environment may not be conducive for studying and this can affect a child's outcomes in school (Boston 2013). Nutritional outcomes of children with many siblings are also affected in large households. The nutritional needs of younger and/or older children may sometimes be placed above those of other children in the household (Bird 2007:4).

Methodology

The paper uses data that were collected in Boipatong Township, which falls under the Emfuleni Local Municipality. The township is in proximity with other townships in the municipality with similar poverty situations, such as Bophelong and Sharpeville. The population of the municipality is estimated to be 721 663, with the young population comprising children aged between 0 and 18

accounting for 25.4% and the elderly (65+) accounting for 4.9% of the total population. The population of Boipatong is 22 168. The sample size was 300 households. Data were collected using a household questionnaire adopted from published studies such as those of Viljoen and Dunga (2014) and Dunga and Sekatane (2014). The questionnaires were adapted to suit the nature of the study, and the questions were directed to the head of household to determine what were lacking for children in their households. The deprivation index is adapted from Barnes (2009) list of essentials for children. The index which included 13 child-specific items was created using a scale ranging from one 'never lacked' to five 'always lacked'.

Model specification: The study uses a deprivation index both as a measure of child deprivation and as a dependent variable. The independent variables were age, gender, number of people in the household, household income and employment status. Since the deprivation index is measured on a continuous scale, it can be treated as a continuous variable, necessitating the use of an OLSs regression. The OLS regression will therefore be specified as follows:

$$DI = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 \beta \quad (1)$$

Where DI is the deprivation index and all the other variables being the age of the household head, gender, marital status, employment status and education level. The deprivation index is derived from a number of questions that were used to measure child deprivation.

Results and discussion

The results are presented first by descriptive statistics of the important independent variables, such as number of people in the household, gender of head of household and the marital status of the head of the household. Then, the OLS regression is also presented.

Descriptive statistics: Table 1 illustrates the distribution of the number of people in the households in Boipatong Township. The minimum number of people in the sample was found to be one person and the maximum to be eight people in a household. The mean for the size of the household was found to be 3.2, which means that on average, a household has three people.

Table 2 illustrates the gender distribution of the heads of households in Boipatong Township. The results in the table show that there are more female-headed households than are male ones, with female-headed households accounting for 54.3% of the sample. This situation is not surprising or

TABLE 1: Number of people in the household.

Variable	N	Minimum	Maximum	Mean	Std. deviation
Number of people in the household	300	1.00	8.00	3.2	1.74459
Valid N (list-wise)	300				

Source: Survey data (2013)

unique to Boipatong. A study by Dunga and Sekatane (2014) found a similar result in Bophelong Township.

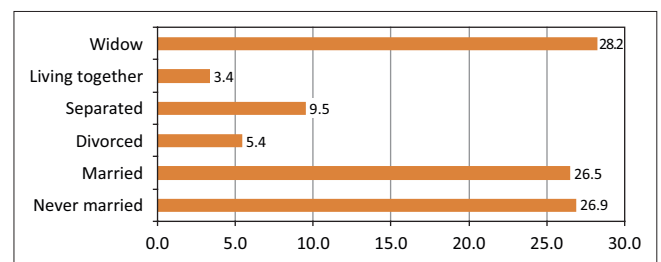
Figure 1 shows the marital status of the residents of Boipatong Township. A total of 28.2% of the respondents in the sample were widowed, which is a slightly greater portion than those who are married (26.5%) and those who have never been married (26.9%). A total of 9.5% of the population have been separated while 5.4% are divorced. The results give an indication that more of these households have children living in single-parent households.

Figure 2 shows the employment status of the sampled population of Boipatong Township. A total of 36.3% of the population are not economically active while 26% of the residents in the sampled population are unemployed. Only 17.7% of the sampled population is formally employed. The heads of the household who are involved in informal activities make up 20% of the sampled population. Those who are not economically active may be the disabled, the elderly/pensioners or heads of household who chose not to be employed. The implication is that the township has a significantly high rate of unemployment, and this has a bearing on the poverty status. Children living in these households are likely to be deprived as the head of household is unemployed. The high rate of unemployment is however not unique to Boipatong Township. Viljoen and Dunga (2014)

TABLE 2: Gender distribution of the heads of households.

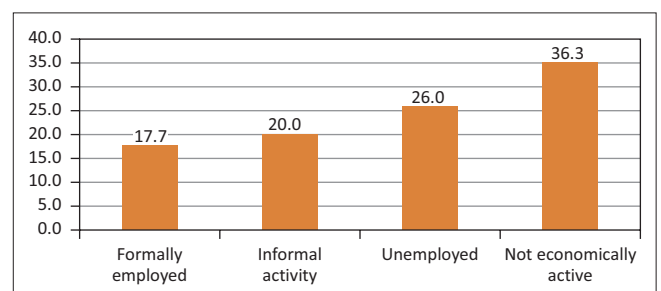
Gender distribution	Frequency	Percent	Valid percent	Cumulative percent
Males	137	45.7	45.7	45.7
Valid Females	163	54.3	54.3	100.0
Total	300	100.0	100.0	

Source: Survey data (2013)



Source: Survey data (2013)

FIGURE 1: Marital status of the head of household.



Source: Survey data (2013)

FIGURE 2: The employment status of the heads of households in Boipatong Township.

have also shown high level of unemployment in Bophelong Township, where employment and poverty status of women were investigated.

Results of the OLS regression: Table 3 presents the OLS regression results of the determinants of deprivation using the deprivation index specified in Equation 1 as a dependent variable. The determinants are the independent variables while the index is the dependent variable. The results show that the sum of income has a negative coefficient value which means that there is a negative relationship between income and deprivation, as the income increases in a household, the less deprived a child becomes. The number of people in the household has a positive coefficient meaning that there is a positive relationship between the number of people and the deprivation index, which implies that an increase in the number of people would lead to an increase in the deprivation index, and this simply means that the number of people in the household will increase the value of the index because the bigger the household, the more deprived the children are. The age of the head of household has a negative coefficient meaning that a child is less deprived when the head of household is older. The employment status categories show the results of the index for each category. The point of reference is the 'not economically active'. The results in the regression table show that the children in the sample are less deprived when the parents are employed. The Department for Work and Pensions of the United Kingdom (2011) argues that a child with an employed parent or parents has a lower risk of falling into the poverty trap or experiencing any material deprivation in the household. A child in a workless household has greater chances of being deprived. About 65% of inhabitants in the United Kingdom moved out of poverty after finding employment.

Children from families where the parents are involved in informal activities seem to be more deprived with a beta value of 2.098. The coefficient is positive and increasing, which shows that irrespective of the parents being involved in informal activities, the children are still more likely to be deprived even more than the not economically active category,

which is the reference point. The results for the unemployed category show that children coming from households with parents who are unemployed are less deprived. This result makes Boipatong Township particularly unique since there is a positive relationship between unemployment and child deprivation. The reason for such results may be that the family is sustained through government grants as a source of income or assistance from relatives. The results of the regression further show that children from families where the parents are married or living together are less deprived (beta value -0.629) compared with children living in households where the parents are either divorced or separated (beta value 0.862), which may be because of the joint income of the married parents which could be more compared with the single source of income for divorced parents.

Children living with widowed parents are more deprived according to the results of the regression. With a beta value of -0.477, the children in these households are worse off compared with children from families with married parents, which can be supported by a study by Bárcena *et al.* (2014) who argue that children from households where the parent is widowed are likely to be more deprived than children from families where the parents are married or living together. A widow will have a more deprived household compared with that of a widower. Looking at the qualifications category, the results show that children coming from households with parents that are less educated tend to be more deprived, which can be seen with the results of the parents with a grade 1–7 level of education. The beta value of the independent variable is considerably high at 3.640 and that for parents with a grade 8–12 level of education is lower at 1.729. The parents in the second category are better off because the more educated they are, the less deprived their children will be, and this also holds good for parents with a tertiary qualification. With a beta value of -0.949, the children can be considered to be less deprived because the parents are more educated.

The results for the gender category, in this case for the females, show that children from female-headed households are less likely to be deprived. These results can be considered to be

TABLE 3: OLS regression results.

Coefficients (Model)	Unstandardised coefficients		Standardised coefficients		
	B	Std. error	Beta	T	Sig.
(Constant)	39.300	4.242	-	9.264	0.000
Sum of income	-0.001	0.000	-0.359	-4.502	0.000
Number of people in the household	0.462	0.391	0.075	1.181	0.239
Age	-0.018	0.073	-0.021	-0.249	0.804
Formally employed	-4.286	2.356	-0.151	-1.819	0.070
Informal activity	2.098	1.901	0.077	1.104	0.271
Unemployed	-0.219	1.757	-0.009	-0.125	0.901
Married/living together	-0.629	2.008	-0.026	-0.313	0.754
Divorced/separated	0.862	2.134	0.027	0.404	0.687
Widow/widower	-0.477	2.010	-0.019	-0.237	0.813
Grade 1–7	3.640	2.868	0.149	1.269	0.206
Grade 8–12	1.729	2.546	0.078	0.679	0.498
Tertiary	-0.949	3.074	-0.025	-0.309	0.758
Female	-0.812	1.433	-0.037	-0.567	0.572

Source: Survey data (2013)

unusual since female-headed households are considered to be more deprived than the male-headed households. Klasen, Lechtenfeld and Povel (2011) argue that female-headed households do not necessarily need to be always poor. Factors that need to be considered when determining if a female-headed household is poor are the profile of the country being surveyed, the level of the welfare available to female-headed households, the type of female-headed household, the equivalence scale to be used and finally the 'considerations of economies of scale'. In this case, most of the female-headed households with children benefit from child grants. It could also mean that these female-headed households are placing the needs of the children ahead of need of all other members in the household.

Conclusion

The results reflected that there is a negative relationship between the Child Deprivation Index and income. As income increases, the size of the index became smaller. The results also showed that children living in households with older parents are less likely to be deprived as opposed to those living in households with younger parents. When the index was measured against the employment status, it was found that children whose parents are formally employed are less deprived compared with children whose parents were engaged in informal activities. Those whose parents were employed in informal activities were found to be deprived. An interesting observation was that children from families where the parents were unemployed were found to be less deprived, which might have been because the parents have other means of obtaining income either from child or pension grants and/or handouts from family members. The results for marital status showed that married couples and those who are living together are less deprived, and this is highly likely because of the combined income of both the individuals. The children living with parents who are widowed were found to be more deprived than children with both parents. The deceased parent could have been the breadwinner of the household, and the income of the deceased is now forfeited. The results for the level of qualification showed that children living in households where the parents have only a primary school qualification were more deprived than children from households with any other level of parental education. Children whose parents had a secondary education were also found to be more deprived compared with children whose parents have a tertiary qualification. This result was highly expected because as the theory stated, children coming from households where parents are more educated are less deprived. The results for gender depicted that children from female-headed households in Boipatong Township are less likely to be deprived compared with children from the male-headed households, and these results were not expected

and are therefore unique to Boipatong Township, which may be because the children are being supported by their fathers as well as the extended family members coupled with government grants.

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Competing interests

The author declares that they have no financial or personal relationship(s) that may have inappropriately influenced them in writing this article.

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The role of small, micro- and medium enterprises in employment creation: The case of the manufacturing sector in Botswana

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Small, medium and micro-enterprises (SMMEs) are globally reputed for employment creation, which reduces poverty, empowers citizens economically and increases the gross domestic product (GDP). Most studies concentrate on SMMEs in general, but currently there is no study specifically concentrating on the role played by the manufacturing SMMEs in employment creation in Botswana, hence the need for this study. This paper explores Botswana manufacturing SMMEs' contribution to employment creation in the past decade by comparing the proportion of micro-, small and medium enterprises plus establishing the employment figures of each SMME category. Sampling was done using geographical clustering and snow-balling technique. A hundred participants returned the filled-in structured questionnaire. It has been concluded that the manufacturing SMMEs currently employ only a small percentage of the population of Botswana. It is recommended that the Government of Botswana should provide incentives to foreign manufacturing firms and also adopt flexible labour laws. Manufacturing SMMEs should hire enough employees, so that they can delegate, take advantage of and explore export opportunities for SMME growth. Entrepreneurship lessons should be infused into primary and secondary school curricula to train children from an early age to own businesses, thereby increasing employment creation. Colleges and universities should produce graduates who are industry-ready.

Introduction

Botswana's underdeveloped manufacturing sector contributed only 3.8% of the gross domestic product (GDP) in 2010. Manufacturing small, medium and micro-enterprises (SMMEs) are unlikely to be a major driver of economic growth through year 2021, unless some measures are taken to grow manufacturing SMMEs (The Business Monitor International 2014:20). Growth and sustenance of manufacturing SMMEs is imperative to economic development of economies, Botswana in particular. Manufacturing SMMEs can immensely contribute towards employment creation, poverty eradication and economic diversification (Nkwe 2012). Furthermore, if run well, manufacturing SMMEs can increase the GDP of Botswana. Botswana's unemployment rate stands at 20% (Central Statistics Office [CSO] 2013), which discourages graduates and their parents alike. However, in Botswana, manufacturing SMMEs face challenges that intimidate their survival, hence the failure to hire people or pay them (Jefferis 2014). Owners of manufacturing SMMEs, therefore, end up doing most tasks themselves, resulting in low productivity. This paper's main objectives are therefore to compare the proportion of micro-, small and medium enterprises in Botswana using the case of Botswana manufacturing SMMEs and to establish the employment figures of each SMME category. This study complements the Botswana government's concern with developing entrepreneurship, especially among the youth, to reduce unemployment, curb crime and bring about economic diversification (Mutoko 2014; Republic of Botswana 2012).

Literature review

While a lot of effort has been put by the government to support SMMEs, little importance has been given to manufacturing SMMEs to help them succeed and create jobs. In view of the fact that micro-enterprises are the majority, it is disturbing to note that Botswana has had active government programmes to support SMEs since the 1970s, but none of these have reached the micro-enterprises to a significant degree, particularly the manufacturing SMMEs (World Bank 2011). One of the reasons could be that there are not many appropriate or affordable financial products and business development services (BDS) for micro-businesses, which form the majority of SMMEs (Okurut & Ama 2013).

Definition of SMMEs

There are various definitions for SMMEs. But for the sake of this study, the Botswana national definition of SMMEs shall be used. Botswana SMME policy outlines the following: a 'micro-'

business is one with six or less employees and an annual turnover of up to P60 000 (US\$6000). A 'small' business is one with less than 25 employees and an annual turnover between P60 000 and P1 500 000 (US\$6000–US\$150 000). A 'medium-sized enterprise' is one with 25–100 employees and an annual turnover of P1.5 million–P5 million (US\$150 000–US\$500 000) (Task Force Report on the Policy on SMMEs in Botswana 1998).

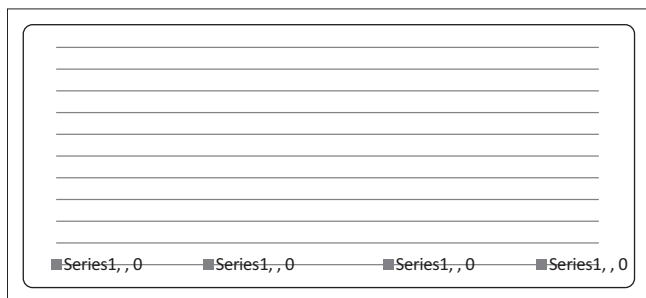
Literature on formal sector employment in Botswana

According to CSO (2012), overall employment increased by 0.6% (2239 persons), from 387 426 in June 2011 to 389 665 persons in September 2012. The central government had the highest increase in employment with 3.0%, followed by parastatals with 2.9%. The local government recorded a decline of 2.3% in employment. The Mining and Quarrying sector also recorded a decline of 3.0% between June 2011 and September 2012. In September 2012, 16 033 persons (4.1%) in formal sector employment were non-citizens. The major employer of non-citizen employees was the Wholesale and Retail Trade, which employed an estimated 18.9% of the non-citizen workforce. Manufacturing followed with 14.9% and Education recorded 13.5%.

Figure 1 shows employment by sector in 2012. The private sector was the largest with 48.4%, followed by the central government with 26.9%. The local government employed 20.2% and parastatals hired 4.5%. According to CSO (2012), the private sector employed a total 187 968 people, the central government employed a total of 101 912 people, whole sale and retail hired 47 436 people, the manufacturing sector hired about 36 638 people and parastatals employed 16 992 people (CSO 2012). These statistics indicate that the manufacturing sector has high potential to boost the economy and create more jobs. Unfortunately, of late, a number of big manufacturing SMMEs have been closing business in Botswana partly because of economic financial crisis, choosing to establish business in neighbouring South Africa to maximise incentives offered (Fatoki & Asah 2011).

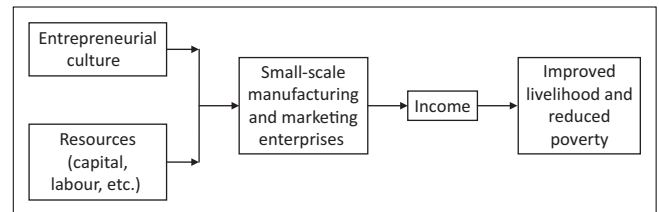
Theoretical issues

Barrett and Reardon (2000) cited in FAO (2001) postulates a conceptual framework for employment creation. This is shown in Figure 2.



Source: Central Statistics Office (CSO), 2012, 'Employment figures in Botswana', viewed 15 June 2015, from <http://www.cso.gov.bw/index.php/sector-statistics/labour>

FIGURE 1: Employment by sector, September 2012.



Source: Barrett and Reardon (2000) cited in Food and Agricultural Organization (FAO), 2001, 'Food documentary repository: Employment generation through small-scale dairy marketing and processing', viewed 15 July 2015, from www.fao.org/docrep/007/y4860e/y4860e02.htm

FIGURE 2: Conceptual framework for employment creation.

Barrett and Reardon (2000) cited in FAO (2001) opine that firms need to develop an entrepreneurial culture which combined with factors of production, such as labour and capital, result in a number of people being hired (Sekwati 2010). The business owners make profits and employees get income to sustain their families, improve their livelihoods and reduce their poverty (United Nations 2014). This framework can be tailor-made for Botswana manufacturing SMMEs to improve the economy and their families. Correct use of factors of production and a good entrepreneurial culture increases the chances for business growth which result in high employment creation. Botswana currently has a reputation of poor work ethic which works against entrepreneurial success (Makgala 2013).

Empirical evidence of job creation in Botswana by SMMEs

Botswana's leading and utmost all-inclusive nation-wide domestic study of SMMEs was piloted in 1992. The survey projected that the SMME sector comprised 48 000 enterprises, hiring over 88 000 people. The 1998 Task Force Report on the Policy on SMMEs in Botswana specified that there were roughly 56 300 SMME businesses functioning in Botswana, engaging 125 000 people, including business owners. Fifty thousand (89%) of the SMMEs were micro-enterprises, 5000 (9%) were small enterprises and 1300 (2%) were medium enterprises. The 1998 report also projected that the SMME sector's contribution to GDP was approximately 30–45%, whereas that of large firms was approximately 38–48% of GDP. According to the CSO (2000) Survey of the informal sector in 1999/2000, about 28 726 household enterprises employed a total of 222 611 persons (Task Force Report on the Policy on SMMEs in Botswana 1998). On the contrary, Botswana Guardian Newspaper (2013) suggests that in Botswana SMMEs contribute up to 35% to the country's GDP. The growth of SMMEs in the country has been aided much by government structures that support entrepreneurship (BIDPA 2012). These include Citizen Entrepreneurial Development Agency (CEDA 2012) which funds SMMEs with very low or no interest loans, Local Enterprise Authority (LEA) which trains and mentors SMMEs (LEA 2014) and Young Farmers' Fund which helps young farmers with financial support to do agricultural business (Republic of Botswana 2012). The advent of LEA and CEDA has obviously increased employment opportunities in Botswana, including self-employment.

According to BIDPA (2012), employment in Botswana by type of employer in 1998 was distributed as shown in Table 1:

As shown in Table 1, about 36% of employees are employed by government while both large firms and SMMEs employ 32% of employees each. The 32% of employees in SMMEs fall into micro-SMMEs 14%, small SMMEs 14% and medium 4%. Although the current figures presently are higher than the BIDPA Survey of 1998, the definitions of SMMEs seem to remain the same (Mwobobia 2012). The trend in Botswana is such that most SMMEs are owned by citizens while most large enterprises are owned by foreign investors and the government (Sekwati 2010). It follows that for more growth of the economy, SMMEs need more support to avoid failure (Hatten 2011) and to be able to employ more people, thereby enhancing livelihoods of citizens (Mutoko 2014).

Methodology

Both inductive and deductive research designs were used to go hand-in-hand with the pragmatism philosophy adopted (Saunders, Lewis & Thornhill 2012:145–146). Both quantitative and qualitative approaches were followed (Dawson 2009). A structured questionnaire was filled in by 100 manufacturing SMMEs from all over Botswana. Majority of the questions were quantitative, but multi-response questions were qualitative in nature. Geographical cluster sampling was used where the participants emerged from urban centres, such as Gaborone, Francistown, Serowe, Kasane, Maun and Ghanzi. Cluster sampling refers to a sampling technique, where a cluster or group of population elements constitutes the sampling unit, instead of a single element of the population (Saunders *et al.* 2012). The main reason for cluster sampling was that SMMEs tend to be located in urban areas (John Hopkins Bloomberg School of Public Health 2009). However, because of the fact that some of the members on the list either did not have contacts or their contacts were outdated, the researcher had to use snowballing technique, where participants referred the researcher to other manufacturing SMMEs that might be willing to take part in the survey. The manufacturing sector was chosen for

the study because while manufacturing has the potential to boost industrialisation and diversify the economy (United Nations 2010), in Botswana the manufacturing sector is struggling for survival and growth (CDE 2013; Okurut *et al.* 2011). This is evidenced by the lack of past studies specifically majoring on manufacturing SMMEs.

Results and discussion

A total of 100 respondents comprising 71 males and 27 females aged between 19 and 68 years responded to the questionnaire. Responses from questionnaires were collated and analysed using the Statistical Package for Social Sciences analytical tool. Findings from respondents were illustrated using graphs, diagrams and pie charts where necessary. Results show demographics and employment figures of local manufacturing SMMEs. During the survey, participants were implored upon to state whether they sold their products in Botswana only, both in Botswana and exportation or just exportation. Table 2 illustrates the form of market for Botswana manufacturing SMMES.

Table 2 demonstrates the potential of local SMMEs to grow into exportation, thereby hiring more people and increasing job opportunities. Majority of manufacturing SMMEs (84.1%) are involved in selling within Botswana while 15.9% of them operate both locally and internationally. This scenario is a clear indication that Botswana manufacturing SMMEs are still scrambling for the small local market (2 million people) and very few firms (15.9%) are taking advantage of the over 200 million worth of customers in SADC. Opportunities are there across the borders, but SMMEs struggle for market as mentioned by (Mutoko 2014; Mwobobia 2012; Nkwe 2012). According to Naidu and Chand (2012), SMMEs in the manufacturing sector of industrialised countries are mainly export oriented. However, in Botswana, most manufacturing SMMEs sell locally. This suggests that SMMEs need help for international and global exposure. Respondents were classified according to their total number of employees. The classification was according to the Botswana government definition, as stipulated by the Republic of Botswana (2012). Micro-enterprises employ six people and below, small enterprises employ 7–24 people and medium enterprises employ 25–100 people. Figure 3 illustrates the percentages of participants that are micro-, small or medium.

Figure 3 shows that 65% of manufacturing SMMEs are micro-enterprises, 19% are small enterprises and 12% are medium enterprises, while 4% of the respondents did not indicate

TABLE 1: Employment in Botswana by type of employer.

Organisation	Percentage employed	Sub-divisions
Government	36	
Large firms	32	
SMMEs	32	Micro-, 14%; small, 14%; medium, 4%

Source: BIDPA, 2012, *Performance and competitiveness of small and medium sized manufacturing enterprises in Botswana*, viewed 04 July 2014, from <http://bidpa.co.bw>

TABLE 2: Kinds of business and business models.

Business model	Kind of business					
	Single/family		Joint ownership		Total	
	Frequency	Per cent	Frequency	Per cent	Frequency	%
Exportation	0	0	0	0	0	0
Selling within Botswana (local)	61	87.1	13	72.2	74	84.1
Both local and exportation	9	12.9	5	27.8	14	15.9
Total	70	100	18	100	88	100

Source: Research findings (2015)

their employment figures. The trend suggests that majority of the SMMEs in the manufacturing sector are micro-enterprises, followed by small enterprises and finally medium enterprises. Most entrepreneurs tend to run businesses for survival and a few of the micro-enterprises survive to grow into small businesses, let alone medium enterprises (Makgala 2013). The trend agrees with the Republic of Botswana (2012), which shows results of the 1998 SMME Policy with more micro-enterprises followed by small enterprises and finally medium enterprises. Participants were requested to indicate the number of employees in their enterprises. The results of employment figures are shown in Figure 4.

Figure 4 shows that of the people employed by manufacturing SMMEs, 200 are employed by micro-enterprises, 204 by small enterprises and 651 by medium enterprises. The total of employees according to the study is 1055.

Comparison of Figure 3 and Figure 4

Although micro-enterprises are more in number (65%) than SMEs, they have the lowest number of employees (200 people). Small enterprises are about 19% of all SMMEs and they have 204 employees, while medium enterprises,

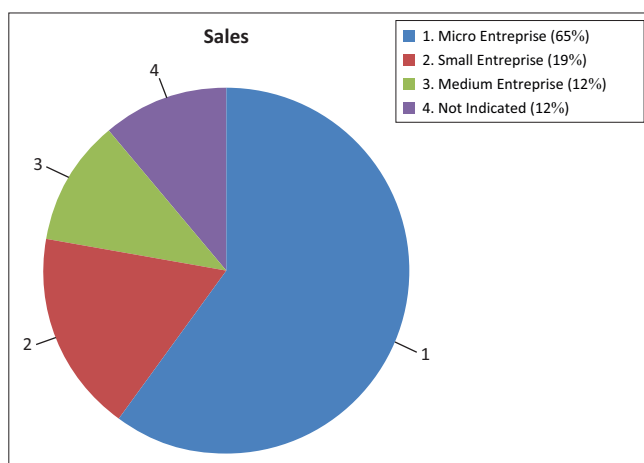
although they form only 12% of the total SMMEs, employ the highest number of people (651). The 100 respondents in the survey employ a total of 1055 people. Indeed, this reduces unemployment by creating more job opportunities. But considering the unemployment rate in Botswana (20%), there is a great need for SMMEs to be boosted, so that they can employ more people. SMME owners need an understanding of the conceptual framework as postulated in literature to grow their businesses, thereby increasing chances of higher employment creation. According to the conceptual framework, SMMEs need to have a good foundation of factors of production and the right entrepreneurial culture, as postulated by Barrett and Reardon (2000) cited in FAO (2001). Botswana's current entrepreneurial culture of laziness needs to change if SMMEs are to grow and employ high numbers of people.

Conclusion

The paper has tried to compare the proportion of micro-, small and medium enterprises in Botswana using the case of Botswana manufacturing SMMEs and to establish the employment figures of each SMME category. The study explored the contribution to employment creation in Botswana by manufacturing SMMEs. Findings reveal that the number of employees in accordance to the 100 respondents is a total of 1055. It has been concluded that manufacturing SMMEs currently employ only a small percentage of the Botswana population. However, SMMEs have the potential to grow and hire more people. Therefore, government and other stakeholders should boost the businesses. Indications are that the SMMEs in manufacturing are performing below expectation, in spite of vast global opportunities. If the SMMEs can improve on quality, delivery time and be innovative, they can hire more people.

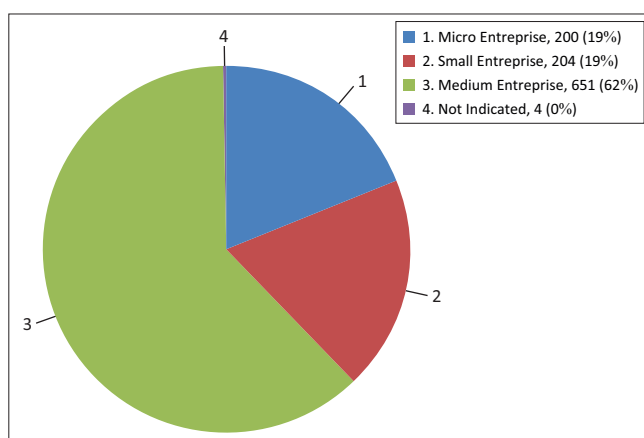
Recommendations

Manufacturing SMMEs are encouraged to hire enough employees, so that they can delegate and take advantage of opportunities and explore export opportunities to develop their businesses. The *Government of Botswana* should give incentives to experienced foreign direct investment manufacturing firms and be flexible with labour laws, as manufacturing industry needs highly skilled labour, which is not readily available in the country. Therefore, manufacturing SMMEs should be allowed to import labour with less hassles on work permit applications. Failure by the government to formulate flexible labour laws results in manufacturers migrating to South Africa where there are better incentives; this can result in many people in Botswana losing their jobs. Entrepreneurship subjects should be infused into *primary and secondary school* curricula so as to train children from an early age to own businesses, thereby increasing employment creation. *Colleges and universities* are encouraged to develop courses in conjunction with manufacturing industry to make sure their courses are relevant and can produce graduates that are industry-ready. This will help SMMEs to have a hassle-free recruitment of skilled labour.



Source: Research findings (2015)

FIGURE 3: Percentage of SMMEs that are micro-, small and medium.



Source: Research findings (2015)

FIGURE 4: Employment figures for manufacturing SMMEs.

Limitations and scope for further research

It was not easy to get enough participants because some questions were deemed sensitive such as questions on profitability of a firm. The study was also limited because of the fact that a majority (63%) of study participants were based in Gaborone. In future, studies should concentrate on the whole country and possibly extend to other countries in the region to be more comprehensive.

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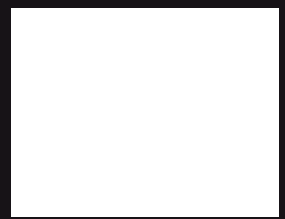
North-West University (Mafikeng Campus) Graduate School of Business & Government Leadership (SA).

Competing interests

The author declares that they have no financial or personal relationship(s) that may have inappropriately influenced them in writing this article.

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