Gordon Institute of Business Science
University of Pretoria

Transitional economy survivors: The role of slack as a competitive strategy and enabler of long-term business performance

Ronnel Yankanna-Mohan

25085451

A research project submitted to the Gordon Institute of Business Science, University of Pretoria, in partial fulfilment of the requirements for the degree of Master of Business Administration.

12 March 2018

Abstract

The role and impact of resource slack, and its effect on firm performance has been extensively researched as a firm-specific competitive advantage in developed economies. This research postulates that resource slack has a positive effect on performance ahead of economic volatility although aspects of agency theory infer that resource slack may also have an inverse parabolic-shaped relationship with firm performance.

Using Penrose's growth theory, the theory of dynamic capabilities and behavioural theory, this paper provides evidence of the role and effect of resource slack as a component of competitive strategy within an emerging market context. Three major types of slack are investigated within "transitional survivors" which are firms that survived the first transition period from apartheid (1990-1998) along with "transitional economy champions" which are firms that survived both the first transition period as well as the second transition period from the global financial crisis (2004-2012). Findings suggest that through entrepreneurial behaviour and dynamic learning capabilities, unabsorbed and potential financial slack play major roles in encouraging firm resilience, agility and the 23-year survivorship of the champions. Results from the regression analyses indicate that an amalgamation of slack-types is required to have a positive effect on firm performance. In addition, the polynomial regression analyses suggest no evidence of a significant inverse parabolic relationship between slack and performance in the case of South African firms.

This research contributes to competitive strategy literature from an emerging market perspective, adding a deeper understanding of the role of slack as an enabler for long-term firm performance. Findings offer key insights to managers who may not fully appreciate the adaptive, flexible and absorptive qualities of slack and its effect on performance ahead of bouts of social, political and economic uncertainty or change, which are endemic to the emerging market context.

Keywords

Declaration

I declare that this research project is my own work. It is submitted in partial fulfilment of the requirements for the degree of Master of Business Administration at the Gordon Institute of Business Science, University of Pretoria. It has not been submitted before for any degree or examination in any other University. I further declare that I have obtained the necessary authorisation and consent to carry out this research.

Name: Ronnel Yankanna-Mohan

Signature:_____

Date: 12 March 2018

Table of contents

List of tables

List of figures

List of acronyms and abbreviations

AGCS	Allianz Global Corporate Speciality
VRIN	Valuable, rare, inimitable and non-substitutable
RBV	Resource-based view
ROA	Return on assets
ROE	Return on equity
EBITDA	Earnings before interest, tax, depreciation and amortisation
PPE	Property, plant and equipment
SG&A	Sales, general and administration expenses
SD	Standard Deviations
VIF	Variance inflation factor

Chapter 1: Introduction to the research problem

1.1.   Problem definition

Traditionally, businesses were considered to behave in a conventional, structured and predictable manner; employees were manageable, inputs were steady, and products were produced according to a consistent standard (Wiere, 2013). Over the past decade, however, businesses have found themselves having to deal with a speedily changing environment involving consumer's rapidly shifting demands and regular technological changes (Drnevich & Kriauciunas, 2011; Li & Liu, 2014).

These changes may lead to businesses losing their front-runner position or becoming obsolete and so force businesses to question their previously successful processes and structures. They are encouraged to question the scope of their ability to adapt or learn and to keep abreast of these environmental, consumer and technological changes to remain competitive and ensure long-term performance (Bray, 2017; Chan, 2013; Wiere, 2013).

1.1.1. Context

Today's global environment is also fuelled by social, economic and political uncertainty (Liu, 2013), largely driven by the global shift towards a technological and digital era (Bray, 2017). This technological universality is swiftly changing the environment in which businesses operate (Chan, 2013), some front-line adopters within this era are Google, Amazon and Alibaba. These businesses ascended their services and diversified their product offering within a variety of markets (Teece, 2017; The Economist, 2014). Their ability to adapt to the changing environment and their consumer's needs as well as investing in various innovative portfolios (Talay & Townsend, 2015) have allowed them to capture a large extent of the global market. This enables companies such as Amazon to crowd out new competition and disintermediating other service and retail brick and mortar competitors (Chan, 2013), such as of Walmart or Costco (Bukhari, 2017).

The ubiquity of this technological and digital era encourages the rapid introduction of new innovative technologies and solutions as well as increased information processing. These adaptions are also supplemented by the speedy adoption rate of such innovations by consumers (Chan, 2013; Dediu, 2013; Dyer, Furr & Lefrandt, 2014). It is suggested that these innovations provide the consumer with a level of power that businesses need to appreciate and effectively manage (Chan, 2013).

As a result, businesses find themselves having to continuously learn and adapt to operate in an increasingly dynamic environment (Teece, Peteraf & Leih 2016). These global changes can destroy businesses, removing them from their once dominant position (Matai, 2011) or force them to focus on evolving from their ridged unbending operating habits to a more adaptable or flexible manner (Chan, 2013).

Santos (2017) suggests that emerging markets, such as South Africa, are dramatically affected by these economic challenges and changes. This is exacerbated by the fall of commodity prices, currency depreciation and China's moderate deceleration in economic growth (Santos, 2017). In addition, the on-going political and institutional uncertainty, accompanied by the recent downgrade by rating agencies Standard & Poor's, Fitch and Moody's, has resulted in an increased volatility in the South African emerging market, suggesting severe impacts on South African businesses and the population; these players are now required to manage and mitigate their way through this dynamic economic landscape (Deloitte, 2017).

These worldwide characteristics further enhance levels of globalisation and competitiveness amongst firms and nations (Wilden, Gudergan, Nielsen & Lings, 2013). The accessibility and evolution of technology promotes a high degree of competitive intensity, forcing these entities to keep up in this "self-escalating, coevolving system of the red queen" race (Derfus, Maggitti, Grimm & Smith, 2008, p. 61); to gain a competitive advantage, to stay relevant and to survive, firms must innovate and deliver consumer-focussed, relevant products ahead of the competition (Talay, Calantone & Voorhees, 2014).

These levels of volatility should encourage leaders to analyse their current businesses and resources; are they flexible enough to learn from the past and adapt to the current exogenous factors? Do they have the ability to regularly experiment with various business processes, product innovation, portfolios and strategies? Are they reliant on one particular method of generating value? Can they ensure consumer loyalty through innovative product offerings? Li and Liu (2014) further emphasise that rapidity in decision-making and action-taking is an essential source of competitive advantage for businesses operating in today's technological and information-based environment.

Ultimately, leaders need to question their organisational capabilities and whether they can encourage flexibility, learn from the past and adapt to the new economic horizon (Reeves & Deimler, 2011).

Allianz Global Corporate and Specialty (AGCS) Africa chief executive officer Delphine Maïdou, further emphasises the need for businesses to internally scrutinize their capabilities when saying "businesses constantly have to be on their toes, turning out new products, services or solutions in order to stay relevant to the customer and to thrive in this rapidly changing and globally competitive environment" (Allianz, 2016, para. 5).

This volatile economic outlook creates a burning platform forcing South African business leaders to refocus and align their strategies and priorities and to utilise their resources in an efficient manner to ensure their long-term survival ahead of environmental unpredictability. They also need to take cognisance of not falling into the trap of employing redundant strategies which may have been successful for them in the past (Reeves, Love & Tillmanns, 2012). This long-term business survival is not just an imperative for the organisation but for the economy as well.

1.2.   Purpose statement

1.2.1. Theoretical background and contribution

In the face of environmental variability, companies need to develop competitive management strategies, such as the popular dynamic capabilities, to assist them achieving long-term business performance (Salge & Vera, 2013). Dynamic capabilities encourage businesses to relook at their resources and then learn to "adjust or reconfigure their resource base and operating routines" (Salge & Vera, 2013, p.158). This provides them with a state of competitive advantage, allowing businesses to respond appropriately to the environmental changes identified above (Li & Liu, 2014).

Internationally, while dynamic capabilities is a popular research topic for competitive advantage and management strategies (Schreyögg & Sydow, 2011), there is a lack of understanding in terms of how these capabilities or resource bases are facilitated within organisations and how they are able to achieve long-term value (Achtenhagen, Melin & Naldi, 2013; Wilden et al., 2013) in emerging markets and specifically in a South African context. Emerging and transitional economies with underdeveloped institutions provide a relevant platform to investigating such competitive strategies; providing appropriate insights to the current theory base which, Li and Liu (2014) reiterate, has been predominantly researched from a developed economy perspective.

Competitive advantages are amplified by the firm's ability to survey and sense its environment and to learn (Sull, 2009). Wilden et al. (2013) suggest that a business' resource base may become devalued if it is not appropriately aligned with the external environment and thus firms may lose their competitive edge. It is therefore imperative that firms continuously learn to monitor their internal resource capacity, structures and processes and align them with the external environmental dynamics, ensuring congruency (Liu, Ding, Guo & Luo, 2014). This level of congruency can be achieved through understanding how firms develop and implement strategies based on dynamic capabilities and resource management.

Wilden et al. (2013) also suggest that organisational structure and business performance has been a popular research avenue, where studies propose that linkages exist between firm strategy, structure and performance. While these studies suggest a degree of alignment with the environment and the firm's dynamic capabilities, there is to yet to be a more defined empirical argument in this regard.

There has been a lack of research on how businesses ensure that they have the relevant and appropriate internal capacities in place, or whether they learn how they adapt and align with the transitional environment. Banalieva (2014) argues that it is imperative to understand this as it encourages survival and academically contributes to aspects of dynamic capabilities (Teece, 2012). One suggested facilitator for the firm's resource base or dynamic capabilities strategies is organisational slack.

Organisational slack can be categorised into financial, human resource and operational slack and can be loosely defined as the excess amount of resources which firms can utilize to their strategic advantage (Zona, 2012). This research report suggests that organisational slack may serve as a link as to how dynamic capabilities are facilitated within an organisation, enabling long-term business performance and competitive advantages. This research provides the opportunity to empirically enhance the theoretical literature in this strategic management-based domain.

1.2.2. Business contribution

Li and Liu (2014) suggest that a firm's ultimate aim is to gain a competitive advantage. However, with numerous environmental dynamism occurring, firms find it difficult to maintain this advantage.

This competitive advantage depends on the firm's ability to evolve and adapt their strategies when having to deal with unforeseen events (Matai, 2011). Bray (2017) argues that competitive advantages falter when businesses struggle to escape the pull of their past legacy, processes, procedures, management techniques and strategies; struggling to create new means of success in dynamic environments.

Sull (2009) and Matai (2011) further emphasise the importance of agility and rapid responsiveness in turbulent environments. Businesses are expected to rapidly adapt their resources and strategies to survive and remain sustainable in the current turbulent landscape (Matai, 2011). They are required to concentrate on the future, learn from the past and continuously question whether they have the structure and resources to cater for "the latest disruptive technology landscape, changing the marketplace, and public demand" (Bray, 2017, para. 2).

As previously identified, a resource-based strategy to assist in this regard is dynamic capabilities, where activities include re-allocating, acquiring, relinquishing and merging resources according to the market behaviour (Lin & Wu, 2014). These resource allocation activities can be defined as the ability of the firm to manage various investments within their operational capacity and capability (Coen & Maritan, 2011).

Investigating the role of dynamic capabilities within an emerging market context, provides opportunities for leaders to understand the levels of management involved with firm-based resources; the influence of institutional aspects and the level of learning, adaption and facilitation required to effectively manage resources and capabilities to survive (Sirmon, Hitt, Ireland & Gilbert, 2011).

A crucial aspect, however, is to practically understand how companies achieve these levels of resource activities or flexibility (de Jong, Verbeek & Verwijmeren, 2012). This includes understanding the role of excess resources, or resource slack, in sustaining business performance in volatile environments (Bradley, Shepherd & Wiklund, 2011a), whether firms use the opportunity to learn from the past and, finally, identifying the fundamental slack drivers that facilitate competitive advantage in dynamic economic periods.

1.2.3. Research objectives

Van Schoor (2017) conducted a survival analysis on 304 industrial firms listed on the Johannesburg Stock Exchange (JSE) between 1991 and 2013, accounting for the institutional transitions which occurred in South Africa during the time. The analysis identified that while some firms survived the first transitional period into democracy (identified as transitional survivors for the purposes of this research), only 53 firms survived over the entire 23-year transitional period; they were identified as transitional economy survival champions. Their survival was attributed to specific absorptive factors which assisted these champions in negotiating these transitional periods: firm age and size, the type of industry and financial health.

Another phenomenon, as suggested by Sull (2009) and Teece et al. (2016) is resource slack or an excess capacity of resources. This excess capacity provides firms with the capability to absorb market threats or create flexibility within the firm thereby allowing them to navigate variabilities within the environment (Pal, Torstensson & Mattila, 2014). This research will investigate the comparative role, evolution and influence of resource slack as absorptive and agile characteristics and as a facilitator for dynamic capabilities within these transitional survivor and champion firms.

Though dynamic capabilities and organisational slack have been suggested to have a positive relationship with firm performance (Gruener & Raastad, 2016), this research explores these aspects from a South African business context. This is achieved by investigating whether South African firms actively accumulate slack and through correlation and regression analysis, identifying which type and what level of slack provides the most relevant contribution to firm performance.

This is investigated in a comparative manner over two specific periods; the transition from apartheid to democracy (period one), comparing the transitional survivors with the champions which operated and survived during that period and finally the transition from the global financial crisis (period two), comparing whether any dynamic learning is evident within the champions operating in period two, when compared to their role of slack in period one.

As already mentioned, previous studies within this field have been emphasised in developed and western economies, providing an opportunity to investigate this research void from a transitional business perspective and in an empirical manner (Li & Liu, 2014).

The research will assist in empirically and theoretically clarifying the relationship and identifying the level of contribution between resource slack and firm performance as well as quantitatively investigating whether firms learn from their past in term of resource slack and its effect on performance as a means to achieve competitive advantage and long-term business performance in emerging turbulent landscapes.

Ultimately, this research report investigates whether resource slack as management strategy has assisted in enabling competitive advantages and long-term business performance within the identified transitional economy survival champions when compared to the transitional survivors and their own past performance. Understanding whether firms accumulate and employ categories of resource slack may shed light on what sets these sustained businesses apart from the rest. This research provides opportunities for other emerging markets or South African firms to employ similar tactics by learning and employing such competitive management strategies to survive in turbulent environments and to assist in building the economy and improving job creation.

1.3.   Research outline

Through the literature review in Chapter 2, this research project intends to understand the drivers behind these actions; how do the identified survival champion companies ultimately achieve resource allocation, providing the company with organisational agility and adaptability to compete in a dynamic market and achieve long-term business performance. The research questions guiding the literature review are based on the enablers of strategic management, with a focus on resource slack and business performance.

Chapter 3 summarises the literature review into proposed hypotheses to be tested in an empirical manner; the research emphasis is on understanding the drivers or enablers of the survival companies in a South African context. The research design and quantitative methodology are validated in Chapter 4. The methodology details investigating these strategies and enablers within the survival companies to ascertain whether long-term business performance is a function of the above. Statistical analyses and research limitations are elaborated in Chapter 4.

Chapter 5 represents the empirical results of the statistical assessments, orientated about the identified hypotheses. These results are further discussed and examined, with regard to the positioned hypotheses and literature, in Chapter 6. Finally, the research is concluded in Chapter 7, providing insight into several key findings of the investigation. This chapter also postulates several recommendations from a managerial perspective and recommendations for future research.

Chapter 2: Literature Review

2.1.   Introduction

In today's turbulent environment, businesses are forced to analyse their means of strategic management, learn from the past and orientate their focus on developing avenues for competitive advantage and value-based performance (Hitt, Ireland, Sirmon & Trahms, 2011). Leaders are required to venture away from the old routine of predictable planning, which tends to become obsolete and ineffective (Reeves & Deimler, 2011) to having a more adaptive and flexible approach in leading a business that can grow and perform in environments based on uncertainty (Bahrami & Evans, 2011).

Bahrami and Evans (2011) described flexibility or agility, as being able to "withstand turbulence, to bounce back, to weather stormy conditions, and to stay the course" (p. 23). This is achieved by building capabilities to ensure that businesses are agile enough to manoeuvre around turbulence when required and are resilient enough to absorb any shocks which may negatively impact the business. This can be summarised as the ability to strategically and effectively learn to build and allocate excess resources through dynamic capabilities.

Dynamic capabilities and organisational slack studies have been popularly conducted in developed markets, with minimal meaningful insight into transitional economies such as South Africa (Li & Liu, 2014). South Africa's transitional period stemmed from 1994, with the transition from Apartheid and then the global economic recession experienced in 2008. Through investigating the means of survival, Van Schoor (2017) identified firms which managed to survive the first transitional period before encountering failure or insolvency and more specifically, the 53 firms labelled as survival champions which have overcome both these transitional periods through factors of absorption.

These companies were able to absorb threats and manoeuvre through changes experienced during these events. This provided a robust base to investigate attributes of dynamic capabilities, learning, and resource slack as a determinant of competitive advantage and long-term business performance within these transitional survivors and champions and their local emerging context (Tan & Peng, 2003).

The literature first reviews opportunities and the relevance for research in emerging and transitional markets such as South Africa. Secondly, the literature delves into the definition and perspectives of the resource-based view of firms, further elaborating on dynamic learning capabilities theory as a strategic competitive advantage for firms. Thirdly, the literature provides context into agile and absorptive firm strategies and identifies the link between the various categories of resource slack and Penrose's theory of growth and finally argues the dual the relationship between resource slack and firm performance.

2.2.   Emerging markets and Van Schoor's transitional survival champions

There have been ample studies of dynamic capabilities in international markets, specifically Asia, Europe and South America, with the inclusion of a few emerging economies such as Brazil, India, China and Russia. However, a vast majority of the studies have remained in developed countries and not necessarily other emerging markets such as South Africa (Xu & Meyer, 2013).

Emerging markets provide differences from developed markets, largely with regards to poor organisational transparency, the government having more direct control while also being one of the main players, and unpredictability due to economic, political and institutional factors (Xu & Meyer, 2013). There was also a suggested difference in the management and utilisation of firm resources between developed and emerging economies with variable institutions (Gaur, Kumar & Singh, 2014).

These uncertain institutional environments posed more risk for firms due to their influence on the firms' resources and internal characteristics, ultimately affecting firm performance (Su, Xie & Li, 2009). For these reasons, it was critical for firms in such environments to engage in strategies which allowed them to mitigate and protect themselves from the effects of the above-mentioned risk-factors (Gaur et al., 2014); their strategies and behaviours needed to be aligned to the institutions in which they existed.

Van Schoor (2017) reiterated that institutional changes created a challenging landscape for firm survival. Firms which were able to survive the transitions from 1991 to 2013 embodied characteristics of absorption or resilience, which allowed them to navigate through the transitional changes within their environment (Van Schoor, 2017).

Firm age, size, profitability, industry type and financial leverage were considered important absorptive characteristics and were concluded to be significant to firm survival during transitional periods.

2.3. Institution-based view of the firm

Institutions have become essential in understanding strategy management within developing economies largely due to the degree of influence they exert on the businesses and their environment (Young, Tsai, Wang, Liu & Ahlstrom, 2014).

The institution-based theory of the firm suggested that institutions stipulated the rules of the game; dictating whether firms were able to easily acquire external resources and whether the rules assist in decreasing the level of volatility affecting the firm (Su et al., 2009). These aspects suggested that institutions can ultimately affect firm strategies and performance.

Gaur et al. (2014) argued that developed markets and institutions tend to enable firms to behave and compete in a more effective and efficient manner as opposed to less developed institutions which created costly transactions and inefficient market-based activities for firms. Institutional processes and regulations were also affected by inertia (Liden, 2012); they either focussed on creating new and efficient opportunities for businesses and their engagement with the markets or they clung to older more rigid rules, reducing a firm's opportunities to adapt to the globalized environment.

This aspect was further reiterated by firms which operated in developed institutions; they were inclined to have more focussed and specific strategies, aligned with their environment. In contrast, firms which operated in emerging markets with underdeveloped institutions concentrated on diversification within their product offerings or industries of operation (Gaur et al., 2014), ensuring numerous avenues for business opportunities in an attempt to mitigate any negative institutional effects within their markets and operations.

Institutional theory emphasised the effect intuitions have on firms, their strategic decisions and the overall management and execution of firm-based resources (Young et al., 2014); specifically, how these resources are created, accumulated, deployed or subjugated (Gaur et al., 2014). Sirmon et al. (2011) further suggested that firms which align themselves with the formal institutional rules and environment have a greater opportunity of successfully managing their resource base and potentially encouraging performance and growth.

Based on understanding the characteristics of firm agility and resilience within a dynamic and underdeveloped institutional environment, it was pertinent to explore and elaborate on these identified concepts and theories: a resource-based view of the firm, dynamic capabilities, characteristics of flexibility, categories of resource slack and its negative parabolic relationship with firm performance. Table 1 provides a summary of these main theories and their referenced academics relating to competitive advantage and long-term business performance.

Table 1: Key theories and academic references

Theory	Academic reference
The resource-based view of the firm	Bradley, Shepherd & Wiklund (2011b); Dyerson, Wu & Harindranath (2015); Hitt, Ireland, Sirmon & Trahms (2011); Huang, Sirmon, Hitt, Ireland & Gilbert (2011); Li & Liu (2014); Paeleman & Vanacker (2015); Wilden, Gudergan, Nielsen & Lings (2013).
Dynamic capabilities and learning	Achtenhagen, Melin & Naldi (2013); Ambrosini, Bowman & Collier (2009); Bahrami & Evans (2011); Coen & Maritan (2011); Dixon, Meyer & Day (2014); Drnevich & Kriauciunas (2011); Hitt et al. (2011); Makkonen, Pohjola, Olkkonen & Koponen (2014); Salge & Vera (2013); Schreyögg & Sydow (2011); Shamsie, Martin & Miller (2009); Sirmon et al. (2011); Tan & Peng (2003); Wilden et al. (2013).
Organisational flexibility	Achtenhagen et al. (2013); Akgün & Keskin (2014); Bahrami & Evans (2011); Belderbos, Fernhaber & Patel (2012); Li & Liu (2014); Reeves & Deimler (2011); Sull (2009); Wilden et al. (2013); Sull (2010); Sullivan & Tang (2012); Teece, Peteraf & Leih (2016); Tong & Wu (2014); Weber & Tarba (2014).

Resource slack and Penrose growth theory	Azadegan, Patel & Parida (2013); Bourgeois (1981); Bradley, Shepherd & Wiklund (2011a); Goerzen & Beamish (2007); Hitt et al. (2011); Kovach, Hora, Manikas & Patel (2015); Lockett & Wild (2013); Paeleman & Vanacker (2015); Pal, Torstensson & Mattila (2014); Shepherd & Rudd (2014); Stan, Peng & Bruton (2014); Sull (2009); Teece et al. (2016); Vanacker, Collewaert & Paeleman (2013).
Human resource slack	Dai & Kittilaksanawong (2014); Lecuona & Reitzig (2014); Paeleman & Vanacker (2015); Stan et al. (2014); Sull (2009); Vanacker, Collewaert & Zahra (2017); Wang, Choi, Wan & Dong (2016).
Operational slack	Azadegan et al. (2013); Hendricks, Singhal & Zhang (2009); Kovach et al. (2015); Manikas & Patel (2016); Modi & Mishra (2011).
Financial slack	Bourgeois & Singh (1983); Bourgeois (1981); Bradley et al. (2011a); Gruener & Raastad (2016); Kim & Bettis (2014); Lampel, Bhalla, & Jha (2014); Lockett & Wild, (2013); Pierce & Aguinis (2013); Singh (1986); Stan et al. (2014); Sull (2009); Tan & Peng (2003); Vanacker et al. (2013).
Inverse "u" relationship between slack and performance	Azadegan et al. (2013); Bahrami & Evans (2011); Bradley et al. (2011b); Hitt et al. (2011); Kim & Bettis (2014); Kovach et al. (2015); Lockett & Wild (2013); Paeleman & Vanacker (2015); Pierce & Aguinis (2013); Vanacker et al. (2013); Vanacker et al. (2017).

2.4. Resource-based view of the firm

Li and Liu (2014) proposed that a firm's competitive advantage is anchored within its resource base; its long-term competitive firm performance is achieved through resource (technological, human and assets) configuration, specifically relating to the resource-based view (RBV) of the company (Eisenhardt & Martin, 2000). Firms with excess valuable resources tended to perform at a superior level (Paeleman & Vanacker, 2015) when compared to firms with fewer resources. However, Li and Liu (2014) argued that resources which are rigid were inclined to be ineffective in achieving strategic advantage; rigid resources had a crippling effect on firm's competitive advantage and performance due to the inability to adapt those resources to the changing environment.

Resource-based theory focussed on internal characteristics of the firm (Huang, Dyerson, Wu & Harindranath, 2015) and postulated that firms which accumulated resources which are aligned to the valuable, rare, inimitable and non-substitutable framework (VRIN) achieved a higher level competitive advantage resulting in sustainable business performance (Lin & Wu, 2014).

Sirmon et al. (2011) emphasized that these resources must be "accumulated, bundled, and leveraged" (p.1391) for its full potential to be appreciated and that this, naturally, also depended on the firm's ability to learn and evolve to achieve this (Hitt et al., 2011).

The consonance of a firm's resources was dependent on the effectiveness and decision-making of the firm's management leading to competitive advantages as well as their ability to know when and how to orientate these resources and capabilities to add value (Hitt et al., 2011).

This included their decision-making and action-taking with regard to managing their resource base through acquisition, accretion or divesting of certain resource portfolios; configuring and deploying resources in exploring new ventures or maintaining current services and, finally, their general ability to leverage off their resources to add value to their markets (Sirmon et al., 2011).

The VRIN of resources was based on the a priori view that all firms were heterogeneous, in terms of their resources and internal capabilities and resources were considered immobile (Huang et al., 2015).

Wilden et al. (2013) explained that performance heterogeneity within firms was a result of the firm's processes and structures which promoted their ability to utilize their VRIN resource base more effectively and efficiently; through strategic resource base orchestration, sensing and capitalising on market opportunities. The means of converting VRIN resources into a competitive advantage was the theory of dynamic capability (Lin & Wu, 2014).

2.5. Dynamic capabilities and learning: A competitive advantage

Dynamic capabilities (used as an extension of RBV and VRIN) focussed on strategic resource management and allocation. Dixon, Meyer and Day (2014) had identified two specific types of dynamic capabilities: adaption and innovation. Dynamic capabilities was the driver behind organisational adaption (Salge & Vera, 2013), which promoted levels of resource deployment, exploitation and agility or innovation which focussed on market exploration and creation (Dixon et al., 2014; Teece, 2017). It ultimately improved a firm's speedy and efficient response to the dynamic environment and helped distinguish them within their competitive industries (Wilden et al., 2013).

These characteristics were also explained by Teece (2007), who suggested that significant components of dynamic capabilities were the ability of a firm to learn, to identify and select resources and reconfigure or exploit firm assets or the resource base ahead of uncertainty (Hitt et al., 2011; Sirmon et al., 2011; Teece et al., 2016). These included providing opportunities for the firms to reconfigure operations, capitalise on prospects and ultimately adapt and learn to survive and improve performance (Drnevich & Kriauciunas, 2011) or learn to explore for new opportunities (Gaur et al., 2014). These aspects of dynamic capabilities and organisational learning were utilized to achieve competitive advantage, long-term performance and survival in dynamic environments (Teece et al., 2016).

Dynamic capabilities could be considered as evolving; a continuous process of learning. It is this characteristic that assisted firms to not only be agile or absorptive but to also overcome the hurdle of inertia (Achtenhagen et al., 2013) that could have prevented business from being sustainable and surviving in transitional environments. This could specifically be attributed to regenerative capabilities, adopting new changes and overcoming inertia, as well as learning to renew capabilities through the reconfiguration of the resource base; these were characteristics of the dynamic capability theory (Ambrosini, Bowman & Collier, 2009).

While dynamic capabilities may have encouraged or enabled change within a business, Makkonen, Pohjola, Olkkonen and Koponen (2014), argued that it may not have necessarily resulted in improved performance due to it being inappropriately utilised in terms of timing or form. This was a function, again, of managerial discretion (Makkonen et al., 2014; Ambrosini et al., 2009) in terms of the context in which these capabilities are deployed (Wilden et al., 2013; Shamsie, Martin & Miller, 2009).

Drnevich and Kriauciunas (2011) further suggested that managers may not have extracted the true benefits and advantages of such capabilities, making it difficult to recognise and respond to environmental pressures and thus survive.

Wilden et al. (2013) reiterated that successful and superior sustained firm performance was achieved when there was congruency between the internal resource base, organisational structures and processes facilitating dynamic capabilities and finally, the external environment; ultimately allowing dynamic capabilities to evolve according to the firm's internal and external environmental context. This was further emphasised by Paeleman and Vanacker (2015) who suggested that firms at different stages or in dynamic contexts required different resources to enable long-term performance.

This positive evolution and effect on long-term firm performance could also be attributed to effective organisational learning and managerial decision-making (Sirmon et al., 2011). Although dynamic capabilities focussed on organisational structure in terms of adaptive advantages (Wilden et al., 2013), there has been a lack of focus on the capital structure enabling the adaptive advantage of a firm's resource base; in other words, when and how should firms adjust their capital structure to enable the adaptation or renewal of its resources to ensure survival and sustained performance ahead of economic variability.

2.6.   Organisational flexibility: Sull's agility and absorption strategies

Li and Liu (2014) reiterated the importance of rapid responsiveness as a source of competitive advantage; this linked back to the speed at which managers design and execute their decision-making to be agile or flexible enough to grasp opportunities and negotiate environmental threats through implementing internal protective structures.

Sull (2010) emphasised that during turbulent environments, organisations that inherently showcase agile and absorption characteristics were the survivors of such environments. This concept of agility and absorption (or flexibility) was an extension of the dynamic capability theory and the resource-based view of the firm (Teece et al., 2016). Sull (2009) categorised agility into three different strategies: strategic, portfolio and operational agility.

Characteristics of strategic agility included continuously surveying the environment for opportunities, generating options for growth sensing, learning quickly and then seizing these opportunities through entering new markets, investing in new technology, investing in capacity and resource re-structuring (Sull, 2009; Teece, 2016; Wilden et al., 2013;) while staying aligned with the external environment.

A firm's ability to sense and survey the internal and external environment provided opportunities to better understand their asset or resource base, to create new strategic roadmaps which could add value or to adapt current processes accordingly to negotiate threats. Strategic sensing and rapid decision making is essential for firm survival and creating competitive advantages (Li & Liu, 2014).

Portfolio agility involved the ability to shift and adapt resources from poor performing to better performing units or investments (Sull, 2009). A diverse portfolio also allowed a firm to pivot between various initiatives (Bahrami & Evans, 2011), escape problems encountered in the core business and overcome a company's inertia to change (Achtenhagen et al., 2013).

Bahrami and Evans (2011), linked Sull's (2009) concept of portfolio agility to firm's employing offensive and defensive behaviour tactics to manoeuvre through environmental variability. Offensive tactics allowed firms to switch between various portfolios for pre-emptive and exploitive manoeuvres whereas defensive tactics, provided firms with protective and corrective measures (Bahrami & Evans, 2011). These behaviours and levels of portfolio diversity enabled a firm to become agile and absorptive when navigating tough environments; allowing a firm to diversify its risk amongst these diverse portfolios (Belderbos, Tong & Wu, 2014).

The final component of agility was operational agility. This was the firm's ability to exploit resources through speed and execution of the firm's operational processes; these included reducing costs, improving product quality and streamlining processes to improve distribution (Sull, 2009). It was essential that a firm had the intrinsic capacity to design and implement resource changes in accordance with what is required in the external environment; should this capability be absent, firms would struggle to overcome inertia with respect to implementing strategic, portfolio and operational changes resulting in them finding it difficult to adapt to the changing environment (Li & Liu, 2014).

Organisational resilience capacity was defined as a firm's ability to effectively absorb, develop situation-specific responses and ultimately engage in transformative activities to capitalise on disruptive surprises that potentially threaten organisation survival (Akgün & Keskin, 2014). Absorption capacity was defined as the "ability of a firm to recognize, assimilate and apply external knowledge" Fernhaber & Patel, 2012, p. 1520) to create value and increase performance (Sullivan & Tang, 2012). These characteristics of resilience and absorption involved using the information in the external environment to create evolving responses to withstand the volatility or environmental threats (Akgün & Keskin, 2014).

Sull (2009) stated that these absorptive features include low fixed costs, additional or excess cash and staff, tangible and intangible resources, company size and powerful customer buy-in. These characteristics provided defensive and offensive artillery to firms, allowing them to absorb environmental shocks, adapt and stay ahead of their rivals.

Agility and absorption were not mutually exclusive and needed to be leveraged off each other depending on the level of volatility in the environment. Firms that learned to achieve an evolving balance between these strategies were more successful and effective in performing ahead of volatility (Sull, 2010) as they were able to rapidly adapt, providing them with sustainable competitive advantage (Reeves & Deimler, 2011).

This level of flexibility and endurance, through innovation, re-invention and an ability to pivot, was further discussed by Bahrami and Evans (2011). Silicon Valley managed to adapt amidst a dynamic environment by "constantly re-inventing themselves by re-assessing market opportunities, pre-emptively retiring old products, and introducing new products and services in rapid succession" (Bahrami & Evans, 2011, p. 21). Companies are required to invest significantly in resources to achieve the high level of flexibility (Weber & Tarba, 2014) required in today's environments. The flexibility of firms achieved through agility and absorptive traits (or adaption and allocation of resources) needed to be facilitated or enabled and a suggested driver to accomplish this is slack (Sull, 2009; Teece et al., 2016).

2.7.   Resource Slack and Penrose growth theory

Sull (2009) and Bourgeois (1981) suggested that resource slack (also referred to as organisational slack) encouraged absorptive or resilient characteristics in turbulent environments. This was later confirmed by Teece et al. (2016) who argued that it also assisted with firm agility. Pal et al. (2014) reiterated the agile and resilient characteristics of slack through its ability to assist the development and orchestration of a firm's internal competencies; encouraging flexibility, robust responsiveness in decreasing market effects, absorbing market threats and ultimately creating competitive advantages for firms.

Slack was considered a "strategic phenomenon" (Bourgeois, 1981, p. 30) and "develops when a firm is able to maintain resources in excess" (Bradley et al., 2011a, p. 1073) to be utilised as protective capacities through environmental variations (Vanacker, Collewaert & Paeleman, 2013). Hitt et al. (2011) added to this notion by implying that firms with slack resources had a greater opportunity to explore outside of their traditional markets and competencies, using these opportunities to adapt their existing processes and procedures to succeed.

Management had been accused of employing tactics based on leanness and efficiency where they focus on eliminating slack and costs to boost performance; this, however, leaned towards being applicable for short-term wins and could be counter-productive for the long term (Goerzen & Beamish, 2007) by reducing means of negotiating environmental disruptions. Based on this and reverting to earlier discussions in the context of resource use, Penrose's growth theory suggested that resource slack or accumulation was essential for firm growth but was dependent on how managers choose to use the excess resources (Lockett & Wild, 2013). There were at least three distinct forms of slack resources which have been said to influence company's performance; human resource slack: financial slack; and operational slack (Kovach, Hora, Manikas & Patel, 2016; Paeleman & Vanacker, 2015).

Human resource slack was identified as "excess employees on the payroll" (Paeleman & Vanacker, 2015, p.820), specifically, slack which is "beyond what is required for efficient operation" (Stan, Peng & Bruton, 2014, p.478). Financial slack was defined as the "cash reserves for a firm for a given year" (Bradley et al., 2011a, p.1081).

Operational slack could be defined as "temporal, labour, or physical excesses in the production processes" such as additional inventory or excess capacity (Azadegan, Patel & Parida, 2013, p.2). Companies with financial slack resources were proposed to be agile in the sense that they were more open to implementing new ideas and innovations as well as taking on new investments or markets as a competitive strategy (Bradley et al., 2011a; Shepherd & Rudd, 2014).

Examples of businesses in emerging economies utilising slack included Brazil's Embraer, which used financial slack through a strong balance sheet to absorb the decreasing consumer demands after the 9/11 attacks. In contrast, Embraer's German rival, Fairchild Dornier's survival was severely affected due to lack of excess financial slack (Sull, 2009). Slack in the form of human resources also provided opportunities to recover costs in turbulent times through retrenchments or restructuring through joint ventures and acquisitions and deploying excess staff to these units (Sull, 2009). This reiterated the importance of understanding competitive advantages in emerging markets and the role that these levels of slack play to ensure flexibility and ultimately survival.

2.7.1. Human resource slack

Human resource slack pertained to employees with both low and high levels of expertise (Dai & Kittilaksanawong, 2014). Human resource slack and their expertise could further be segmented into "tacit" or "firm-specific" knowledge and general knowledge (Lecuona & Reitzig, 2014, p.955). The RBV of the firm suggested that employees with firm-specific knowledge were more aligned with the VRIN framework and could be deployed and or allocated to gain competitive advantages (Wang, Choi, Wan & Dong, 2016), specifically by use of exploitation strategies (Lecuona & Reitzig, 2014). Employees who were considered general knowledge workers were less aligned to the VRIN framework due to their lack of specialisation relative to the firm (Wang et al., 2016).

Shifting of the firm's strategy as the environment changed was said to bode negatively for firm-specific employees, largely because their specific skills, for which they were initially hired, may have been misaligned or no longer required with the firm's new strategy; this may have adversely impacted the firm's performance (Paeleman & Vanacker, 2015). Human resource slack could also be segmented into the absorbed category of slack, representing a form of slack which may be difficult to deploy as necessary (Paeleman & Vanacker, 2015).

In addition to this, another downside to firm-specific human resource slack was the inability to deploy staff in the short term due to the employee specificity, again affecting the firm's flexibility (Vanacker, Collewaert & Zahra, 2017). However, general knowledge employees may have provided the flexibility required to adapt to a changing market, potentially ensuring the firm's survival (Wang et al., 2016).

Human resource slack linked back to Sull's characteristic of latent slack as a form of absorption and agility; excess staff tended to decrease a firm's agility and tendency to explore through innovation (Stan et al., 2014) during environmental difficulties. This excess staff also at some point during their employment, tended to be underused or remained idle, again negatively impacting firm's performance (Lecuona & Reitzig, 2014).

It is pertinent to note, however, that this additional or excess slack could also have benefited the firm; it provided an opportunity for the firm to recover costs through retrenching or restructuring when faced with unexpected environmental shifts (Sull, 2009).

2.7.2. Operational slack

Operational slack could be "buffer resources available to support the operational activities of a firm and allows firms to better match variations between supply and demand" (Kovach et al., 2015, p. 1) and manoeuvre through operational disruptions by being versatile. Further to this, the operational slack was suggested to provide operational continuity due to its flexibility and levels of deployment, however this continuity could be costly depending on the context of use (Azadegan et al., 2013).

Operational slack proposed a balance between operational efficiency of managing inputs and outputs and inefficacy by hosting too much slack input that accumulated more cost than the value (Azadegan et al., 2013). Operational efficiency could also be attributed to some characteristics of the VRIN framework, namely valuable and rare depending on the firm's capabilities to execute to generate value (Modi & Mishra, 2011). Operational slack was considered a type of absorbed slack (Azadegan et al., 2013) as it was rooted in the firm's production, providing flexibility and defensive or absorptive strategies based on environmental and market disruptions (Manikas & Patel, 2016).

Manikas and Patel (2016) suggested that operational slack could be stored internally through excess capacity (capacity slack), externally in the supply chain (supply chain slack) through extended cycles of cash conversion, and in inventory levels through (inventory slack). While these types of operational slack provided opportunities to improve firm performance, if this excess capacity remained underutilized, this extension of cash cycle conversions could have placed negative effects on consumers and suppliers in terms of prolonged delivery and payments (Manikas & Patel, 2016), resulting in operational inefficiency. Depending on the type of operational slack in question, redeployment or reallocation could be easy or difficult; additional raw materials and machine capacity made for easy mobility and low transaction costs, however, embedded labour and associated capital could be harder to move (Azadegan et al., 2013).

Slack was suggested to have both positive and negative effects on firm operational efficiencies and profits. Operational slack within the inventory tended to negate negative influences on the supply chain, which may have occurred due to unforeseen circumstances. Inventory slack supported the firm by providing flexibility, allowing the firm to adjust their product offerings and explore new avenues of production processes through their capacity and inventory, catering to their changing markets (Modi & Mishra, 2011).

It was argued that operational slack also increased difficulty when trying to investigate underlying issues arising from production processes and product quality (Modi & Mishra, 2011) and was expensive to accumulate (Manikas & Patel, 2016). Decreased operational slack, however, indicated the firm's lack of absorptive and responsive characteristics (Kovach et al., 2015), enabling disruptions to occur to the production lines and supply chains (Modi & Mishra, 2011).

These characteristics of operational slack related back to Sull's theories on agile and absorptive strategies. This is done by them providing the flexibility to adapt and providing protective buffers (Azadegan et al., 2013; Kovach et al., 2015) in a dynamic environment, allowing firms to attain the long-term performance and competitive advantage.

2.7.3. Financial slack

The flexibility of financial slack was created by managing debt/equity and recoverable inventory (Bradley et al., 2011a); ultimately free cash flow. Aligned with Penrose's growth theory and the use of slack, behavioural theory of the firm suggested that due to its flexible nature, cash was an advantage to assist in facilitating these types of competitive and adaptive changes or opportunities (Kim & Bettis, 2014) and improving long-term business performance, especially during periods of economic downturn as it acted as a savings-cushion (Gruener & Raastad, 2016). According to behavioural theory, this flexibility would encourage firms to experiment and innovate more (Hitt et al., 2011) but they could be prone to making risky decisions (Vanacker et al., 2013). However, having financial slack provided an absorptive or a buffering effect against risky decisions that could have resulted in failure (Kim & Bettis, 2014).

While slack resources provided advantages to cope with dynamic and turbulent markets, it could be argued that organisations may build slack resources for the wrong reasons and not necessarily deploy slack resources to improve resilience and flexibility (Lampel, Bhalla & Jha, 2014). These aspects refer to agency theory (Stan et al., 2014); suggesting that free cash flow could encourage rent-seeking behaviours in managers through misuse and misallocation of excess financial slack for personal gain (Kim & Bettis, 2014; Stan et al., 2014).

This particular type of behaviour indicated the utilisation of slack for "value destroying activities" (Pierce & Aguinis, 2013, p.323), discouraging firm performance. Tan and Peng (2003) elaborated on agency theory by suggesting that managerial goals may also have included "power, prestige, money and job security" (p. 1251) and such managers may have used slack as an opportunity to achieve these goals; it is therefore advised that levels of slack should be kept to a minimum to avoid such self-interested behaviour. Vanacker et al. (2013) contributed to this notion by suggesting that leaders may have also become complacent with the levels of financial slack they hold, which could decrease explorative and entrepreneurial management actions.

One also needed to be wary of holding more cash than necessary, as it could have suggested that the firm was not being effective with its performance (Kim & Bettis, 2014). Ineffective uses of cash included poor investments indicating poor shareholder value (Bradley et al., 2011a). The firm also ran the risk of being acquired should it be prone to hoarding excess cash (Tan & Peng, 2003).

For these reasons, it is suggested that rather than accumulate free cash flow, firms should invest excess cash in high returning projects or pay excess cash as dividends to shareholders (Kim & Bettis, 2014).

Quantitative studies were initially conducted by Bourgeois (1981) and later by both Bourgeois & Singh (1983). These studies suggested eight indicators and relative measures of financial slack, as per the three indicated categories (refer to Table 2).

Table 2: Relative measures of organisational slack (Bourgeois, 1981; Bourgeois & Singh, 1983).

Slack category	Bourgeois (1981) Indicator	Measure	Sign used
Available Slack	Retained earnings	$$\frac{\text{(net profit} - \text{dividends)}}{\text{sales}}$$	+
	Dividend payments	$$\frac{\text{(dividends)}}{\text{net worth}}$$	−
	ratio of working capital to sales	$$\frac{\text{(cash and securities} - \text{current liabilities)}}{\text{sales}}$$	+
Recoverable Slack	ratio of working capital to sales	$$\frac{\text{accounts receivable}}{\text{sales}}$$	+
	ratio of working capital to sales	$$\frac{\text{Inventory}}{\text{sales}}$$	+
	General and administration expense	$$\frac{\text{general and administration expense}}{\text{sales}}$$	+
Potential Slack	Debt to equity ratio	$$\frac{\text{long} - \text{term debt}}{\text{net worth}}$$	-
	Price to earnings ratio	$$\frac{\text{price}}{\text{earnings ratio}}$$	+

The ratio of working capital to sales as a measure was separated due to it containing both aspects of available and recoverable slack (Bourgeois & Singh, 1983). Following Bourgeois (1981) and Bourgeois and Singh (1983), the signs within Table 2 show how the slack measure moves with changes in the indicator:

- A positive sign suggested an increase in the indicator which proposed an increase in slack.
- A negative sign suggested a decrease in the indicator which proposed an increase in slack.

Stan et al. (2014) later refined these indicators of financial slack according to three main categories; unabsorbed slack, absorbed slack and potential slack as summarised in Table 3. Unabsorbed slack referred to excess free liquid cash available within the organisation and was generally the proxy used for financial slack (Stan et al., 2014; Su et al., 2009; Tan & Peng, 2003; Vanacker et al., 2017), whereas absorbed slack referred to excess costs which may take the form of working capital and general expenses and slightly harder to deploy (Singh, 1986) and finally potential slack which suggested future opportunities of generating slack, through means of financing (Stan et al., 2014).

Table 3: Categories of slack (Stan et al., 2014)

Type	Unabsorbed			Absorbed				Potential
	Unabsorbed	Available	High discretion	Financial	Absorbed	Recoverable	Low discretion	
Definition	Uncommitted liquid resources	Untapped resources, immediate access	Easy to deploy resources	Working capital to meet current needs	Excess costs, committed resources	Resources already absorbed as excess costs	Hard to deploy resources	Resources that could be obtained from environment
Measure	$\dfrac{(\text{Cash} + \text{MS})}{\text{CL}}$ [2]	$\dfrac{\text{CA}}{\text{CL}}$ [1]	cash reserves for the year [5]	$\text{CA} - \text{CL}$ [5]	$\dfrac{\text{AR}}{\text{sales}}$	$\dfrac{\text{AR}}{\text{sales}}$	$\dfrac{\text{debt}}{\text{equity}}$ [5]	interest coverage ratio (presence of PS)
	$\dfrac{(\text{CA} - \text{CL})}{\text{TA}}$ [7]	$\dfrac{\text{Cash}}{\text{Book value CA}}$ [6]			$\dfrac{\text{inventory}}{\text{sales}}$	$\dfrac{\text{inventory}}{\text{sales}}$		$\dfrac{\text{debt}}{\text{equity}}$ (lack of PS) [1]
					$\dfrac{\text{SG\&A}}{\text{sales}}$	$\dfrac{\text{SG\&A}}{\text{sales}}$ [3]		
					$\dfrac{\text{WC}}{\text{sales}}$ [2]	$\dfrac{\text{SG\&A}}{\text{sales}}$ [1]		

Key:
Marketable securities (MS) Current assets (CA), Current liabilities (CL), Total assets (TA), Accounts receivable (AR), Sales, general and administrative expenses (SG&A), Working capital (WC) and Potential slack (PS).

Footnotes:
[1](Bourgeois & Singh, 1983); [2](Singh, 1986); [3](Miller & Leiblein, 1996); [4](Mishina, Pollock & Porac, 2004); [5](George, 2005); [6](Latham & Braun, 2009); [7](Peng et al., 2010).

The segmentations found in Table 3 proposed that unabsorbed slack provided the most flexibility for organisations to deploy in the face of dynamic environmental changes, specifically through innovation, acquisition (Stan et al., 2014) and exploration as identified by Penrose's theory (Lockett & Wild, 2013). This was further identified through other characteristics of agility and absorption acknowledged by Sull (2009): diversifying a company's portfolio, including diversifying cash flows and having a strong balance sheet or war chest of cash to invest in new businesses, markets or innovation.

Though financial slack may not have been aligned with the rare and inimitable criteria of the RBV-VRIN framework, these levels of flexibility and ability to capitalise on opportunities suggested degrees of competitive advantage for the firm (Bradley et al., 2011a). More specifically, unabsorbed financial slack acted as a facilitator, assisting a company in sustaining its competitive advantage in a turbulent landscape and emerging economy (Stan et al., 2014). It also had the ability to encourage job creation (Kim & Bettis, 2014) and considering South Africa's context and the current rate of unemployment of 27.7% (Trading economics, 2017), it is a relevant avenue to explore.

2.7.4. The parabolic relationship between resource slack and firm performance

Excess or limited available slack could positively or negatively affect the firm's performance for reasons argued within section 2.7 and relating more-so to the context in which the slack is utilised and how it is managed (Vanacker et al., 2013). It was further advocated that slack scarcity may have encouraged leaders to act in a more entrepreneurial manner, forcing them to look externally for new opportunities (Bradley, Wiklund & Shepherd, 2011b) or it may have prevented managers from being explorative and making risky investments knowing that there was no buffer to support them (Kim & Bettis, 2014).

These arguments proposed that slack had a twofold consequence on growth and firm performance and that it ultimately depended on the level of explorative and entrepreneurship characteristics of the manager (Bradley et al., 2011b). It has therefore been investigated and further postulated that resource slack had a parabolic, or inverted "u" shaped relationship, with firm performance (Azadegan et al., 2013; Kovach et al., 2015; Vanacker et al., 2017), as illustrated in Figure 1.

Figure 1: Inverse parabolic relationship between resource slack and firm performance
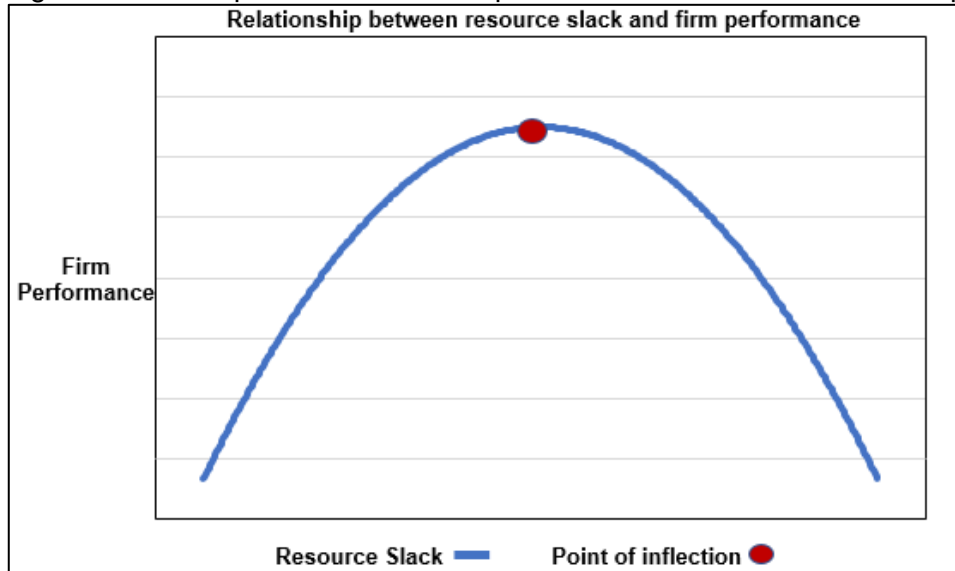
This inverse parabolic relationship illustrates the arguments made with reference to entrepreneurial and agency behaviour, identifying that while there were benefits to slack, there were also disadvantages. As a result, slack needed to be kept at an optimal level or at the point of inflection (Pierce & Aguinis, 2013). This optimal level involved not having too much or too little slack as it could have resulted in a firm losing its competitive advantage and becoming inefficient (Vanacker et al., 2013).

This inefficiency escalated from ingrained institutional behaviour and inertia or path dependency as argued and suggested in Penrose's theory (Lockett & Wild, 2013). Firms may have used slack to their disadvantage by employing excess slack on past processes or activities that granted them past success (by utilising slack within their comfort zones) as opposed to experimenting, innovating and seizing new opportunities (Bahrami & Evans, 2011; Hitt et al., 2011) which generated value and provided a competitive edge.

## 2.8.	Summary

Transitional and emerging economies like South Africa provide a robust platform to test competitive management strategies which were regularly investigated in more developed economies. The degree of institutional and environmental changes experienced in today's markets emphasise the imperativeness of understanding how businesses sustain themselves and survive amidst a turbulent landscape.

The transitional survivors and champions offer an opportunity to test and investigate how popular theories, like dynamic capabilities and resource allocation, are facilitated within these organisations. It also provides an opportunity to understand the degree to which agility, absorption and resource slack are employed to encourage sustainable and competitive business performance, within a local context.

Chapter 3: Research questions and hypotheses

Based on the literature review, while it is known that dynamic capabilities is a popular research theory (Schreyögg & Sydow, 2011), it would be apt to investigate how these levels of resource allocation are facilitated in an emerging market context like South Africa which had recently undergone two major volatile economic phases. The first period involving the transition from apartheid and the second involving the global financial crisis. If managed correctly, organisational slack can act as a lever to encourage long-term business performance through the adaptive and evolving resource management of dynamic capability.

As discussed in Chapter 2, Van Schoor (2017) identified survival champions which survived both transitional periods and other firms which survived only the first period. As there is a lack of theoretical and empirical work on whether slack resources influence firm performance in an emerging market context (Paeleman & Vanacker, 2015), a robust investigation would entail a comparison between Van Schoor's (2017) survival champions and transitional survivors, with regard to slack and its effect on firm performance during period one. This will identify whether the survival champions employed organisational slack as a facilitator for resource allocation, as a competitive strategy for long-term business performance and ultimately their survival when compared to the transitional survivors in period one.

In keeping aligned with dynamic capabilities and learning, it would also be relevant to ascertain whether these champions learned from their past resource slack strategy (period one) and evolved their slack resource outlook when encountering future economic volatility (period two). Table 4 summarises the groups of firms and periods in which the comparative slack and hypothesis testing will occur.

Table 4: Firms and periods used for resource slack comparisons and hypothesis testing

	Period one		
Firms for comparison	Transitional survivors	versus	Champions
	Period two		
Firms for comparison	Champions (period one)	versus	Champions (period two)

Gruener and Raastad (2016) suggested that firms which accumulated slack before the onset of an economic crisis tended to experience superior performance during the subsequent periods, post the economic crisis. Based on this proposal, it would first be relevant to investigate whether these South African firms accumulated organisational slack, identifying the comparative range or flexibility of resource slack that was accumulated, and which type of resource slack was preferred. This was investigated in periods specifically preceding critical economic events.

Penrose's growth theory suggested that resource slack had the ability to drive firm performance in a positive manner and slack provided the resilience and agility required to overcome dynamic environments (Vanacker et al., 2017). In keeping aligned with Penrose's growth theory and behaviour theory of the firm, this research posits the following in terms of human resource, operational and financial slack with regard to firm performance in the transitional survivors and champions operating in period one and period two.

Hypothesis 1
- $H1_0$: there is no positive relationship between human resource slack and firm performance.
- $H1_a$: there is a positive relationship between human resource slack and firm performance.

Hypothesis 2
- $H2_0$: there is no positive relationship between operational slack indicators and firm performance.
- $H2_a$: there is a positive relationship between operational slack indicators and firm performance.

Hypothesis 3
- $H3_0$: there is no positive relationship between financial slack indicators and firm performance.
- $H3_a$: there is a positive relationship between financial slack indicators and firm performance.

It should also be noted that if a relationship does exist between slack and firm performance, it would be pertinent to identify the significance of that relationship in the post volatile periods. Further investigations will be made into the specific categories of financial and operational slack, as identified in Chapter 2, and their level of contribution to firm performance.

Dynamic capabilities and organisational flexibility reiterate the importance of sensing, learning, overcoming inertia and evolving current strategies to suit the current economic context (Sull, 2009; Teece, 2016). Based on this, it would be prudent to investigate whether the survivor champions learned from past economic volatility (period one) by identifying whether there were any significant changes in slack accumulation and to monitor its effect on firm performance when faced with the second economic volatile period (as identified in Table 4).

Azadegan et al. (2013), Paeleman and Vanacker (2015) and Vanacker et al. (2017) suggested that a negative parabolic relationship exists between human resource slack and firm performance, operational slack and firm performance and financial slack and firm performance. This inverted "u" shape is increasingly being investigated in strategic management to identify optimal levels of performance based on the relationship between independent and dependent variables (Haans, Pieters & He, 2016). It is therefore pertinent to continue to test and compare this theory in a South African context by applying it to both the survival champions and transitional survivors, in period one as well as whether the same curve existed within the survival champions in period two.

Hypothesis 4
- $H4_0$: there is no negative parabolic relationship between human resource slack and firm performance.
- $H4_a$: there is a negative parabolic relationship between human resource slack and firm performance.

Hypothesis 5
- $H5_0$: there is no negative parabolic relationship between operational slack and firm performance.
- $H5_a$: there is a negative parabolic relationship between operational slack and firm performance.

Hypothesis 6

- $H6_0$: there is no negative parabolic relationship between financial slack and firm performance.
- $H6_a$: there is a negative parabolic relationship between financial slack and firm performance.

If a significant negative parabolic relationship does develop between slack and firm performance, it would necessary to identify the inflection or turning point at which slack has the biggest positive effect on firm performance and to identify the optimal level (or point of inflection) before deterioration of firm performance occurs (Tan & Peng, 2003).

Chapter 4: Research Method

4.1. Introduction

This chapter details the methodology identified to investigate categories of resource slack as a competitive management strategy and enabler of long-term business performance. The means of data collection and final population are identified and described. Quantitative processes and analyses are discussed and validated with regards to the research approach, ensuring robust consistency through linking core aspects from the literature review to test the stated hypotheses. This section concludes with a discussion of the limitations of the research method selected.

4.2. Choice of method

The research methodology involved a positivism philosophy due to measuring the cause and effect of human resource, operational and financial slack on business performance as well as classifying the accumulation and effect of slack resources through dynamic capabilities and Sull's agility and absorption strategies (Collis & Hussey, 2013).

4.2.1. Quantitative approach and techniques

Based on the research, which supported organisational slack, it was considered a well-known concept and as a result a deductive and quantitative approach was employed (Bluhm, Harman, Lee & Mitchell, 2011).

As established theories from the literature were used to create the hypothesis (Bryman & Bell, 2015) for testing and corroboration, it was suitable to employ quantitative techniques to explore these theories (Molina-Azorin, 2012). The theories debated Penrose and the behaviourist theory, which suggested that, through dynamic capabilities, excess human resource, operational and financial slack assisted and enabled resource allocation; enhancing long-term business performance through flexibility in a dynamic environment. The methodology included descriptive and explanatory techniques as the characteristics and relationships were described and explained (Zikmund, Babin, Carr & Griffin, 2013).

4.3. Research period and design

A longitudinal research design was used to collect available secondary data of the JSE listed firms including the 53 survival champions and the transitional survivors, as identified by Van Schoor (2017). The transitional survivors provided an average industry benchmark for slack comparisons with the survival champions for period one. The champions in period one provided a benchmark for slack comparisons with the survival champions in period two. The secondary data was analysed through statistical techniques and procedures to empirically test the hypotheses (Molina-Azorin, 2012) as described in section 7.4. The use of numerical data and degree of quantification suggested the need for a quantitative research (Harrison, 2013).

This secondary data was utilised to investigate whether these champions employed organisational slack as a competitive strategy for long-term business performance when compared to transitional survivors. The first step in achieving this was to measure the average accumulation of slack, measured as an average over the four years prior to the identified critical periods as was proposed by Gruener and Raastad (2016).

The second step involved understanding the effect of slack on firm performance. The average performance of both the champions and transitional survivors were then analysed during and post the critical events over a period of four years (Bradley et al., 2011b), allowing for the analysis to incorporate the total effects of slack on firm performance by accounting for lag. This is further endorsed by Vanacker et al. (2017) who suggested that managers required time to release and account for the translation of slack into performance generating activities and this also served as means to reduce the effects of reverse causality.

The specific periods for analysis were identified as 1990 to 1998 which included the transition to democracy in 1994, and 2004 to 2012, which included the global financial crises in 2008, as summarised in Table 5.

Table 5: Research periods

Description	Crisis Period 1 (democratic transition)	Crisis Period 2 (global financial crisis transition)	Years analysed per period
Accumulation of organisational slack (pre-crisis)	1990 – 1993	2004 – 2007	4
Effects of accumulated slack on business performance (post-crisis)	1994 – 1998	2008 – 2012	5

The research design provided the opportunity to observe and monitor changes (Saunders & Lewis, 2012) in the accumulation of resource slack and its effect on firm performance over time, specifically within Van Schoor's (2017) identified champions and transitional survivors.

4.4. Population and unit of analysis

A population can be defined as a complete set of groups or entities which share common characteristics and based on the means of testing, a consensus can be established (Zikmund, Babin, Carr & Griffin, 2013). The population and unit of analysis for this research included the firms identified by Van Schoor (2017) which were listed on the JSE during the research period.

4.5. Sampling technique and size

The JSE lists three specific South African Sectors; resource, financial and industrial sectors (JSE, n.d.). The sample of choice used in the study comprised of the industrial sector only. Financial sectors had their own regulated leverage (Chipeta & Mbululu, 2013), which was generally high. While it did not suggest distress for financial firms, it could have suggested otherwise for non-financial firms (Fama & French, 1992).

Resource firms were largely influenced by the exchange rate (Wilcox & Gebbie, 2007) suggesting that their financials fluctuate in accordance with commodity prices. These firms encouraged a high capital outlay for mineral exploration as part of their business model and do not earn an income based on their levels of mining.

Centred on these validations, firms in the financial and resource sectors were excluded from the sample as it could have resulted in a potential skewing of data.

4.5.1. Transitional economy champions and transitional survivors

Van Schoor (2017) identified 304 industrial firms listed on the JSE in 1991 (Appendix 1) and through analysis of firm survival during 1991 and 2013, 53 specific industrial firms were identified as survival champions (Table 6).

Table 6: Survival champions (Van Schoor, 2017)

No.	Code	Name	No.	Code	Name
1	ADR	Adcorp Holdings Ltd	27	MDC	Mediclinic Internat Ltd
2	AFE	Aeci Ltd	28	MRP	Mr Price Group Ltd
3	AFX	African Oxygen Ltd	29	MTA	Metair Investments Ltd
4	AOO	African & Over Ent Ltd	30	NCS	Nictus Ltd
5	APN	Aspen Pharmacare Hldgs Ltd	31	NPK	Nampak Ltd
6	AEL	Allied Electronics Corp	32	NWL	Nu-World Hldgs Ltd
7	AVI	Avi Ltd	33	OCE	Oceana Group Ltd
8	BCF	Bowler Metcalf Ltd	34	OMN	Omnia Holdings Ltd
9	BVT	Bidvest Ltd	35	PIK	Pick N Pay Stores Ltd
10	CAT	Caxton Ctp Publish Print	36	PPC	Ppc Ltd
11	CFR	Compagnie Fin Richemont	37	PWK	Pick N Pay Holdings Ltd
12	CKS	Crookes Brothers Ltd	38	RCL	Rcl Foods Ltd
13	CLS	Clicks Group Ltd	39	RLO	Reunert Ltd
14	CMH	Combined Motor Hldgs Ltd	40	RTO	Rex Trueform Cloth Co Ld
15	CRG	Cargo Carriers Ltd	41	SAB	Sabmiller Plc
16	CSB	Cashbuild Ltd	42	SER	Seardel Inv Corp Ltd
17	CUL	Cullinan Holdings Ltd	43	SHP	Shoprite Holdings Ltd
18	DST	Distell Group Ltd	44	SOL	Sasol Ltd
19	ELR	Elb Group Ltd	45	SUI	Sun International Ltd
20	GND	Grindrod Ltd	46	TBS	Tiger Brands Ltd
21	HDC	Hudaco Industries	47	TON	Tongaat Hulett Ltd
22	IPL	Imperial Holdings Ltd	48	TPC	Transpaco Ltd
23	ITE	Italtile Ltd	49	TRE	Trencor Ltd
24	IVT	Invicta Holdings Ltd	50	TSH	Tsogo Sun Holdings Ltd
25	JSC	Jasco Electron Hldgs Ltd	51	WBO	Wilson Bayly Hlm - Ovc Ltd
26	MAS	Masonite Africa Ltd	52	WNH	Winhold Ltd
			53	YRK	York Timber Holdings Ltd

These survival champions were firms which remained listed on the JSE by the end of 2013 and whose hurdle rate remained at 58% or above; this average hurdle rate was established as a benchmark to indicate delisting due to distress (Van Schoor, 2017). The remaining firms, which were not classified as survival champions, were firms which delisted before the end of 2013 due to financial distress, corporate transaction or firms which remained listed through rehabilitation and therefore were not regarded as true survivors (Van Schoor, 2017). Some of these non-survivors however, did survive during the first period of this study (1990-1998); these were classified as transitional survivors for the purposes of this research. These 53 transitional economy champions and the transitional survivors were used as the final sample for this project.

4.6.   Data gathering process and credibility

Data credibility was a significant condition when conducting quantitative research as it related to the integrity and accuracy of the collected data (Bryman, Bell, Mills & Yue, 2011). To test the hypotheses, audited published financial statements for the transitional survivors and champions, operating within crisis periods one and two, were accessed.

These financial statements were used to identify and test the hypotheses based on the firm's end of year results (Kim & Bettis, 2014). The company's fundamental data and dates of listing were collected through the McGregor BFA (INET BFA, 2017), Osiris (Osiris, 2017) and Share Data (ShareData, 2017) research domains; leading, credible and reputable financial data providers.

4.6.1. Panel data
As this was a longitudinal study, it was appropriate to make use of panel data which allowed for the identified firms' performance to be analysed over time as it provided a larger data set (Hsiao, 2014) and assisted in decreasing the effects of collinearity (Bettis, Gambardella, Helfat & Mitchell, 2014) resulting in a more accurate analysis.

The use of panel data was considered a robust method and has been employed in other strategic management and financial research (Banalieva, 2014). The use of panel data to measure operational, human resource and financial slack averages over a period of time was further corroborated by Kovach et al. (2015), Wang et al. (2016) and Vanacker et al. (2017).

4.7. Analysis approach

Audited financial statements were analysed to identify whether human resource, financial and operational slack were accumulated before the onset of volatile periods, whether a relationship existed between slack and firm performance, whether that relationship was significant and if the slack accumulated did indeed encourage business performance post the volatile period. Finally, the statements were analysed to identify whether a negative parabolic relationship did exist between the slack and firm performance measures. Ultimately, the analysis would answer the question of whether organisational slack could be considered a competitive strategy during periods of economic turbulence to encourage long-term business performance.

To statistically evaluate the hypothesised relationships, it was prudent to identify dependent, independent and control variables first. Thereafter, statistical processes which included cleaning and finalising of the data, descriptive statistics, robust testing for validation and final statistical analyses were employed and are discussed in detail in the following sections.

4.7.1. Dependent variables

To effectively test the hypotheses, measurements of firm performance was identified. Suggested performance metrics for operational, human resource and financial slack were return on assets (ROA), return on equity (ROE) (Lin & Wu, 2014) and profits before tax (Tan & Peng, 2003) or earnings before interest, tax, depreciation and amortisation (EBITDA).

Vanacker et al. (2017) cautioned that ROA as a measure of performance may not account for the levels of human resource slack, which may be included in the ratio in the form of employee costs or tax effects which could disrupt income and ROA. Kovach et al. (2015) and Manikas and Patel (2016) however, suggested that ROA was a suitable measurement to understand the efficiency of asset utilisation within operations; ROA was more commonly used as a performance measurement for operational slack.

ROE was sensitive to capital structure differences and it was recommended that it not be included as a measurement for firm performance (Gruener & Raastad, 2016; Lin & Wu, 2014).

EBITDA was considered a significant performance measure (Tan & Peng, 2003) and curtailed the effects of accounting and tax measures (Paeleman & Vanacker, 2015). EBITDA was scaled against total assets as a means for comparison against firms of different sizes and to further negate the effects of heteroscedasticity (Paeleman & Vanacker, 2015). However, a later study by Vanacker et al., (2017) suggested that EBITDA and profits before tax were highly correlated with another performance measure, gross profits. In keeping aligned with current research, the ratio of gross profits to total assets was used as a measurement of firm financial performance for this research.

In summary, the following were identified as the dependent variables for firm performance and were used to calculate the average firm performance of the champions and transitional survivors post the crises.

- Human resource and financial slack: gross profit performance measure
  - $\left(\frac{gross\ profit}{total\ assets}\right)$

- Operational slack: ROA performance measure
  - $\left(\frac{net\ income}{total\ assets}\right)$

4.7.2. Independent variables

Human resource slack was defined by excess employees within the firm when compared to the industry average. Stan et al. (2014) suggested the following indicators define human resource slack.

- $\left(\frac{number\ of\ employees}{firm\ size}\right)$
- $\left(\frac{number\ of\ employees}{firm\ sales}\right)$

This second indicator was further endorsed by Vanacker et al. (2017) suggesting that firms with excess resource slack were those who employed workers to accomplish a specific sales target in relation to other firms within the industry. This second indicator was considered the independent variable for human resource slack and its average accumulation was appropriately calculated over the pre-crisis periods for both the champions and transitional survivors (Gruener & Raastad, 2016). This indicator was suggested to have a direct relationship with human resource slack (Vanacker et al., 2017).

Operational slack could be measured using three indicators categorised as capacity, inventory and supply chain slack (Hendricks, Singhal & Zhang, 2009; Kovach et al., 2015).

- capacity slack: $CS = \left(\frac{PPE}{S}\right)$
    - CS: capacity slack
    - PPE: property plant and equipment
    - S: firm sales

- Supply chain slack: $SS = \left(\frac{INV}{COGS}\right) + \left(\frac{AR}{S}\right) - \left(\frac{AP}{COGS}\right)$
    - SS: supply chain slack
    - AR: accounts receivable
    - AP: accounts payable

- Inventory slack: $IS = \left(\frac{INV}{COGS}\right)$
    - IS: inventory slack
    - INV: inventory days
    - COGS: cost of goods sold

Recent investigations by Manikas and Patel (2016) indicated that the inventory slack indicator was already catered for in the supply chain slack and that these were highly correlated (Kovach et al., 2015) and therefore was not necessary to be reanalysed. Based on this, capacity slack and supply chain slack were the indicators that were considered as the independent variables for operational slack, where the average operational slack accumulated by both champions and transitional survivors were calculated in the pre-crisis periods (Gruener & Raastad, 2016). Kovach et al. (2015) suggested that either indicator had a direct relationship with operational slack.

Financial slack was defined as excess cash and was categorised as unabsorbed slack, absorbed or potential slack. Based on the various indicators acknowledged in Table 3 and more recent investigations by Vanacker et al. (2017) and Gruener and Raastad (2016), the most commonly used indicators for financial slack were identified and considered the independent variable.

- Unabsorbed slack category:
  - Unabsorbed slack = $\left(\frac{current\ assets - current\ liabilities}{total\ assets}\right)$

  - Available slack = $\left(\frac{current\ assets}{current\ liabilities}\right)$

Common measurements for absorbed slack were ratios between sales, general and administration expenses (SG&A) to sales and inventory to sales. However, Gruener and Raastad (2016) and Bradley et al. (2011b) suggested difficulties in accessing these measurements; specifically, identifying salaries and overheads or difficulty in separating SG&A. Also, these measures do not account for firms which do not stock inventories, specifically firms providing services. As a result, the following indicator was identified.

- Absorbed slack category:
  - Absorbed or Recoverable slack = $\left(\frac{accounts\ receivable}{sales}\right)$

- Potential Slack category:
  - Potential slack = $\left(\frac{debt}{equity}\right)$

Bourgeois and Singh (1983) suggested that both unabsorbed and absorbed indicators had a direct relationship with financial slack and the potential slack indicator portrayed an inverse relationship with financial slack as, described in Table 2.

The average financial slack for the survival champions and transitional survivors were calculated for the pre-crisis periods (Gruener & Raastad, 2016). This provided the opportunity to observe the accumulation of the slack indicators within the survivor champions when compared to the industry average or transitional survivors, specifically before the onset of the stipulated crisis one.

The same ratios were employed to observe the effect of slack on performance post the crises. This created the opportunity to observe whether organisational slack did indeed create a platform for long-term business performance and survival when compared to the industry average.

4.7.3. Control Variables

Bradley et al. (2011a) suggested that control variables include firm size and age as this can affect the degree of resources firms have at their disposal and should, therefore, be controlled using the natural logarithm of number of employees for size (Kim & Bettis, 2014) and taking the natural logarithm of the accumulated years since inception plus one Vanacker et al. (2017). Bradley et al. (2011b) and Vanacker et al. (2017), further reiterated that controlling for firm size by scaling employees to assets can result in the distortion of slack and performance measures. Firms' size and age was controlled for all measures of slack.

Different firms have varying degrees of intangible assets including research and development, the value of their brand, patents and trademarks which can be accumulated and exploited for use (Talay & Townsend, 2015). These assets act as resources and are said to enable the growth potential and enable long-term business performance within firms (Teece, 2007) and should, therefore, be controlled through the intangible assets ratio (Paeleman & Vanacker, 2015).

- $\left(\frac{intangible\ assets}{total\ assets}\right)$

Vanacker et al. (2017) reiterated that the intangible assets ratio was a standard control which is employed when investigating the effect of resource slack on performance.

Bradley et al. (2011b), Gruener and Raastad (2016) and Vanacker et al. (2017) suggested that a firm's past performance may have a profound effect on future measures of performance and slack. As a result, the respective past performance measures were controlled when organisational slack post the crisis was analysed. Specifically, the gross profits performance measure was controlled for when financial and human resource slack were analysed and finally, ROA was controlled for when operational slack was analysed. These variables were controlled for in 1993 for crisis period one and again in 2007 for crisis period two.

4.7.4. Data cleaning and transformations

To ensure quality data was used for the statistical analyses, the data had to be "relevant, clean and in the correct format" (Wegner, 2015, p. 17). This included removing non-survivor firms which did not operate within the specified time periods of 1990 to 1998 and 2004 and 2012.

These firms had been delisted or were inactive during the specified period of analysis. Data cleaning also included monitoring the effects of outliers, removing firms where there were large volumes of incomplete or missing data and enriching the data by using appropriate imputations with the data that was available and ensuring the correct variables were used for the statistical analyses.

Imputations were conducted to predict missing values before aggregating the data into the specific periods (Lohr, 2010). Imputations included using best fit analysis with simple linear regression trendlines to predict the missing values (Wegner, 2015); specifically, number of employees. Following Lecuona and Reitzig (2014), other imputations comprised of imputing the averages using prior and following annual values to predict missing values.

Firms where imputations could no longer be conducted due to a lack of information or potential bias were removed from the database to ensure the credibility and validity of the data (Lecuona & Reitzig, 2014; Wiengarten, Fan, Lo & Pagell, 2017). The use of additional indicators provided another means to negate the missing data.

4.7.5. Descriptive statistics and testing for normality

Descriptive statistics provided the opportunity to broadly describe the identified variables of the financial data; identifying the shape of the data (Wegner, 2015). These included recognising the central location measures, the degree of dispersion and shape of the distribution (measures which were not heavily affected by outliers) within the stipulated independent and dependent variables within each period. These are summarised as

- Central location measures: means or medians,
- Dispersion: standard deviation, and
- Shape: Pearson's coefficient of skewness (Sk_p)
    - $Sk_p = 0$; symmetrical shape,
    - $Sk_p > 0$; positively skewed shape, and
    - $Sk_p < 0$; negatively skewed shape.

Testing for normality of data was imperative as it formed the base assumption for numerous statistical analyses in identifying the reliability of the data (Razali & Wah, 2011).

Histograms and were used to plot the distribution of the data using the means of the variables (Wegner, 2015). In the case where the data did not follow a normal distribution; outliers were removed and the normality tests re-run.

In the event of extremely positive or negative values, Wegner (2015) suggested using the median as a central location measure as opposed to the mean, as it was not affected by extreme values. An additional visual aid in identifying the relative normality of the distribution against an expected or standard normal distribution was quantile-quantile plots or Q-Q plots (Thode, 2002). Histograms and Q-Q plots were re-run to inspect the normality of the data using the median.

4.7.6. Accumulation and range of slack in the pre-crisis periods

Before testing hypothesis one, two and three, the average accumulation of slack in the pre-crises periods (1990 – 1993; 2004 - 2007) were first ascertained for both the champions and the transitional survivors. The transitional survivor's slack accumulation measure established an industry average for comparison with the champions (Azadegan et al., 2013).

These measures assisted in detecting whether a range of slack was accumulated or whether there was a degree of flexibility in slack accumulation. This was linked back to the use of dynamic capabilities and resource allocation as identified by Sull (2009). It was useful to gauge whether there was a predominant type of slack accumulated within the champion and transitional survivor groups. In addition, these accumulation values aided in identifying whether organisational slack was actively accumulated by the survivor champions before the onset of a crisis as a competitive strategy and whether it was employed by the survival champions to encourage long-term business performance post the crises periods.

4.7.7. Correlation analysis

The dependent variables of the average firm performance were measured against their appropriate independent variables of average human resource slack, average operational slack and average financial slack through the indicators discussed in the previous sections. Correlation analysis assisted in identifying whether any relationships existed between the slacks and firm performance (Wegner, 2015).

This analysis was employed for the post-crisis periods for the champions and the transitional survivors. Correlation analysis was conducted between each of the identified resource slack measurements and their relative firm performance measurements to identify Pearson's correlation coefficient (r) which indicated strong correlations when the coefficient value lay near positive or negative one (Wegner, 2015).

To overcome the potential missing variables within the data, a pairwise measured-data correlation analysis was conducted (Wilcox & Gebbie, 2007). The correlations were further tested for statistical significance by testing the *r* of the sample against the correlation coefficient of the population (ρ). To achieve this, hypothesis testing was conducted using the *t-stat* at a 5% level of significance (α) and the *p*-value was used to either reject or accept the null hypothesis (Wegner, 2015), as summarised here.

- H_0: $\rho = 0$

  (there is no significant correlation between the specific independent and dependent variables)
- H_a: $\rho \neq 0$

  (there is a significant correlation between the specific independent and dependent variables)
- If the *p*-value < α then the null hypothesis is rejected in favour of the alternative hypothesis

Scatter plots were also used to visually inspect these correlations and to confirm that there was at least some degree of linearity between the variables before conducting the regression analysis (Wegner, 2015).

The Correlation analysis was conducted on both the champions and transitional survivors for the post-crisis periods as it ascertained whether the accumulation of slack in both groups generated different significant relationships between the variables.

4.7.8. Testing for multicollinearity

Though panel data reduced the effect of collinearity, it was advised that collinearity diagnostics be employed to ensure that there was no significant influence on the variables while running the regression analysis (Gruener & Raastad, 2016).

This was further validated by Kovach et al. (2015) who advised that there was a high correlation between variables such as inventory slack and supply chain slack and as a result, all variables needed to be tested for multicollinearity.

Effects of multicollinearity could result in incorrect regression analysis through inferring incorrect coefficients and standard errors (Grewal, Cote & Baumgartner, 2004). Gruener and Raastad (2016) and Kovach et al. (2015) also recommended using the variance inflation factor (VIF) to test for multicollinearity and to identify the influence of collinearity on the variables; a factor of one indicated that there was no collinearity between the variables and the thresh hold was limited at a vale of ten (Bradley et al., 2011a). In the case where there was a significant collinearity between similar independent indicators, the most commonly used proxy for that particular slack was used in the regression.

4.7.9. Multiple linear regression analysis

Regression analysis was used to test hypothesis one, two and three; to quantify the strength of the relationships between the resource slacks and their performance measures (Bradley et al., 2011a). The regression model was tested for significance by identifying the coefficient of determination (R^2). The R^2 value indicates the degree of variation in firm performance which could be explained by the various slacks and can, therefore, justify whether the model was significant or not (Wegner, 2015). The R^2 range was identified as

$$0\% \leq R^2 \leq 100\%$$

where a higher value, in the context of the data, indicates a more useful model (Wegner, 2015). In investigating the overall significance and R^2 value of the regression model, the population regression coefficients of the independent slack regressors (β) were tested for statistical significance by using hypotheses testing and the *F-test* statistic at a 5% level of significance; the *F-stat* and *p*-value were used to either accept or reject the null hypothesis in favour of the alternative hypothesis (Wegner, 2015) as summarised here.

- H_0: $\beta_i = 0$
  (all the independent slack regressors are insignificant)
- H_a: $\beta_i \neq 0$
  (at least one independent slack regressor is significant)
- If the *p*-value $< \alpha$ then the null hypothesis is rejected in favour of the alternative hypothesis

- If *F-stat* > *F-crit* then the null hypothesis is rejected in favour of the alternative hypothesis

Should the null hypothesis be rejected in favour of the alternative hypothesis, an additional test was conducted to test the statistical significance of the individual slack regressors (β_i) using hypotheses testing and the two-tailed *t-test* statistic at a 5% level of significance. The *F-stat* and *p*-value were used to either accept or reject the null hypothesis in favour of the alternative hypothesis (Wegner, 2015) as summarised here.

- H_0: $\beta_i < 0$
  (the ith slack regressor is insignificant)
- H_a: $\beta_i > 0$
  (the ith slack regressor is significant)
- If the *p*-value < α then the null hypothesis is rejected in favour of the alternative hypothesis
- If *t-stat* > *t-crit* then the null hypothesis is rejected in favour of the alternative hypothesis

4.7.10. Testing for Heteroscedasticity

Analyses conducted by Bradley et al. (2011b) and Paeleman and Vanacker (2015) suggested the presence of heteroscedasticity when testing the relationship between firm performance and organisational slack. This was further validated by Frees (2003) and Kim and Bettis (2014) who indicated that heteroscedasticity may be present in longitudinal data; one first had to run a preliminary regression or other tests to understand if heteroscedasticity is present. This was recommended due to the use of the financial ratios which resulted in some extreme values, potentially shifting the data away from a normal distribution (Gruener & Raastad, 2016).

Heteroscedasticity could be detected using several tests; the first being the Breusch-Pagan test which was used by Maddala (1992) and Kim and Bettis (2014). A second robust test used to alleviate the degree of skewness which was encountered was taking the natural logarithms of the data (Rahaman, 2011).

However, to ensure that the assumptions behind the regressions were true, Wegner (2015) suggested that the use of a residual scatter plots which assisted in identifying whether the data is homoscedastic or heteroscedastic.

The residuals within the scatter plot should have indicated no particular pattern and be concentrated around the horizontal axis with equivalent outward fanning below and above the horizontal axis (Wegner, 2015); this proved that there was no heteroscedasticity present. It also justified the assumptions that the data is indeed homoscedastic and that residuals are independent across all dependent variable performance measures, therefore maintaining the integrity of the regression analysis.

4.7.11. Negative parabolic relationship: Quadratic function

To test hypotheses four, five and six 9whether a negative parabolic relationship exists between human resource slack and firm performance, operational slack and firm performance and financial slack and firm performance), a squared term was added to the regression model; where the dependent variables (firm performance) were regressed on the respective independent variables or slack indicators (Haans et al., 2016; Paeleman & Vanacker, 2015).

To test for the "U" shaped relationship, Haans et al. (2016) recommended the following quadratic equation be included in the model. This term assumed that there is one maximum point and negates the assumption that the point of inflection was at zero.

- $Y = \beta_0 + \beta_1 X + \beta_2 X^2$
    - Y: dependent variable (firm performance)
    - X: independent variable (three categories of resource slack)
    - β: curvature parameter; a strongly negative β_2 suggested an inverse parabolic relationship between the identified variables

Haans et al. (2016) suggested that the data should first be tested for the presence of a significant "u" shaped relationship, before fitting the above-mentioned quadratic function to the regression. To statistically test the presence of an inverse parabolic relationship a polynomial regression was employed, and the following hypotheses test was conducted using the two-tailed *t-test* statistic at a 5% level of significance on a polynomial regression. The *t-stat* and *p*-value were used to either accept or reject the null hypothesis in favour of the alternative hypothesis (Wegner, 2015).

- H_0: $\beta_2 > 0$
    (there is no significant inverse "u"-shaped presence within the data)

- H_a: $\beta_2 < 0$

  (there is a significant inverse "u"-shaped presence in the data)
- If the *p*-value < α then the null hypothesis is rejected in favour of the alternative hypothesis
- If *t-stat* > *t-crit* then the null hypothesis is rejected in favour of the alternative hypothesis

To test the significance or to ensure a strong curvature, both the positive slope (before the point of inflection) and negative slope (after the point of inflection) needed to remain significant and the point of inflection had to exist within the data range (Lind & Mehlum, 2010).

Haans et al. (2016) alluded to several additional tests to confirm the significance of the parabolic relationship, these included

- Adding a cubic term (X^3) to the quadratic equation to check if the relationship was indeed parabolic or whether the cubic terms offered a better fit in the form of an "S"-shaped relationship,
- Dividing the database according to the inflection point and determining if there was, in fact, a positive slope and negative slope before and after the identified inflection point, and
- Removing extreme outliers or smoothing the data to identify the effect on the parabolic relationship.

This parabolic model assisted in identifying whether there was a critical point at which slack could be considered a source of competitive advantage to the firm or when performance started to diminish (Bradley et al., 2011b; Haans et al., 2016; Tan & Peng, 2003).

4.8. Research Limitations

4.8.1. Lack of data
The use of secondary data inferred some degree of limitation (Azadegan et al., 2013) through the lack of financial data available for JSE listed companies as well as the quality and consistency of the data available over the design period; affecting the reliability and results of this research.

While various imputation techniques were utilised to predict some of the missing values, there is a limitation in the fact that these values are estimated best predictions and not as robust as real data (Lohr, 2010). As firms within the financial and resource sectors were excluded, it may also have limited the extent of the research.

4.8.2.   Consistency of data

To achieve the longitudinal study dating back before 1994, several financial sources were used to collect the fundamental data and date of listing; this may have affected the consistency of data recorded and shared.

4.8.3.   Level of mechanisation and heterogeneity affecting human resource slack

As the survival companies have managed to utilise agile and absorptive characteristics to survive, there may be a level of current mechanisation present within the companies and this can affect the analysis of human resource slack within the identified firms. As firms are considered heterogeneous, their preferred levels of human resource slack may be variable (Wang et al., 2016); using an industry average may have been a potentially skewed reference in the calculation of human resource slack in a firm.

4.8.4.   Survival bias

There is a level of bias in using data from firms which have been identified as survivors. This could lead to incorrect conclusions with regards to characteristics affecting the firms which survived and firms which did not due to the intent focus on the 53 champion firms and the transitional survivors only (Cader & Leatherman, 2011).

4.8.5.   The influence of an extremum

Lind and Mehlum (2010) suggested that data containing an extremum estimate may influence the effect of a curvilinear shaped relationship, when there is, in fact, none, creating an incorrect assessment of the relationship between resource slack and firm performance. Haans et al. (2016) reiterated that the turning point must lay well within the data range; turning points which lay at the extreme upper or lower limits of the data range will affect the degree of the curvature-type relationship.

4.8.6. The effect of reverse causality

Bradley et al. (2011b) suggested that reverse causality can affect studies orientated around firm performance. Though this was catered for by lagging the variables over a 4-year time before and after the aforementioned crises (Gruener & Raastad, 2016; Vanacker et al., 2017), there is still a possibility that reverse causality, based on the time periods, may affect the results (Bradley et al., 2011b).

Chapter 5: Results

5.1.   Introduction

This chapter serves to present the results of the analyses in alignment with the framed hypotheses identified in Chapter 3. The results are clustered around four specific analyses: the accumulation of slack, correlation analysis, regression analysis, and the quadratic model. These analyses are used for a comparative assessment between the champions and transitional survivors in period one and finally the role of slack within the champions between period one and two. The different hypotheses and the associated means of analysis are summarised in Table 7.

Table 7: Summary of hypotheses and associated statistical tests

Hypotheses	Analysis
Hypothesis 1: A positive relationship exists between human resource slack and firm performance.	• correlation analysis • regression analysis
Hypothesis 2: A positive relationship exists between operational slack indicators and firm performance.	• correlation analysis • regression analysis
Hypothesis 3: A positive relationship exists between financial slack indicators and firm performance.	• correlation analysis • regression analysis
Hypothesis 4: A negative parabolic relationship exists between human resource slack and firm performance.	• Quadratic function
Hypothesis 5: A negative parabolic relationship exists between operational slack and firm performance.	• Quadratic function

Hypothesis 6:	
A negative parabolic relationship exists between financial slack and firm performance.	• Quadratic function

The results are presented as follows; a description of the sample obtained including the reliability and credibility of the sample data. Next, descriptive statistics and data transformations are discussed and detailed followed by the results indicating the average degree of slack accumulation during the pre-crisis one (1990-1993) and pre-crisis two (2004-2007) between the transitional survivors and champions. Finally, in testing the hypotheses, results from the correlation and regression analyses are detailed and are followed by the quadratic models, indicating the relationship between slack and performance.

5.2. Description of the sample obtained

The final sample consisted of industrial firms identified by Van Schoor (2017) which were listed within the specific crisis period; crisis period one which catered for the transition to democracy (1990-1998) and crisis period two which included the global financial crisis (2004-2012).

Within this sample, 53 firms were the identified by Van Schoor (2017) as survival champions; firms which remained listed in 2013 (Table 6). Following the removal of non-survivor firms which were not listed during the crisis periods and for which missing data could not be substantiated for, a total of 112 firms were finalised as the transitional survivors (Appendix 2) for period one. As only 16 firms were identified as transitional survivors in period two, they were not used for analyses due to potential skewing of results.

5.3. Results on reliability and credibility of the data

In ensuring the data utilised was reliable and credible, audited published financial statements were accurately collected through several principal research domains which provided credible and reputable data; namely McGregor BFA, Share Data and Osiris, further validating the integrity of the data used.

In ensuring that a robust database was created, the effects of outliers were appropriately monitored and removed. In the case of missing data, imputations involving simple linear regressions, deduction and averaging of the data was conducted. Firms where large volumes of data were undisclosed or missing, were removed from the database to ensure the credibility of the data; this was reinforced through the normality testing and data transformations.

5.4.   Descriptive statistics and data transformations

In dealing with extreme outliers and ensuring the manageability of the data, log transformations were conducted on specific control variables such as firm size and age. Initial results in testing for normality indicated that the data did not follow a relatively normal distribution due to outliers. As a result, outliers were removed, and normality tests were re-run. Based on this, descriptive statistics were run on both champions and transitional period champions.

Overall, the standard deviations (SD) indicated relatively low variability around the central location of the data with the variables of the comparative groups within both periods. The distributions were slightly positively skewed as indicated by the Pearson's coefficient of skewness ($Sk_p > 0$), except for a few variables as indicated in Appendix 3.

5.5.   Slack accumulation during pre-crisis periods

To understand the effect of slack on firm performance post volatile events, it was necessary to first investigate whether resource slack was accumulated before the onset of the identified crises. Human resource slack, operational slack and financial slack averages were measured during the pre-crisis years for period one (1990 - 1993) and period two (2004 – 2007). These averages were investigated in the transitional survivors for period one; this provided a benchmark for comparison against the champions within period one. The average slack accumulation within the champions of period one also provided a comparative average for the same champions in period two. This was analysed to keep in line with the micro-foundations of dynamic capabilities theories; learning and evolving from past strategies encourage long-term business performance.

5.5.1. Human resource slack

Figure 2 indicates the accumulation of human resource slack within the transitional survivors for pre-crisis period one and the champions for pre-crisis periods one and two. It is observed that the transitional survivors commenced period one with elevated slack levels when compared to the champions. The champions within period two accumulated a lower degree of slack when compared to the previous period.

Figure 2: Accumulation of human resource slack in pre-crisis periods
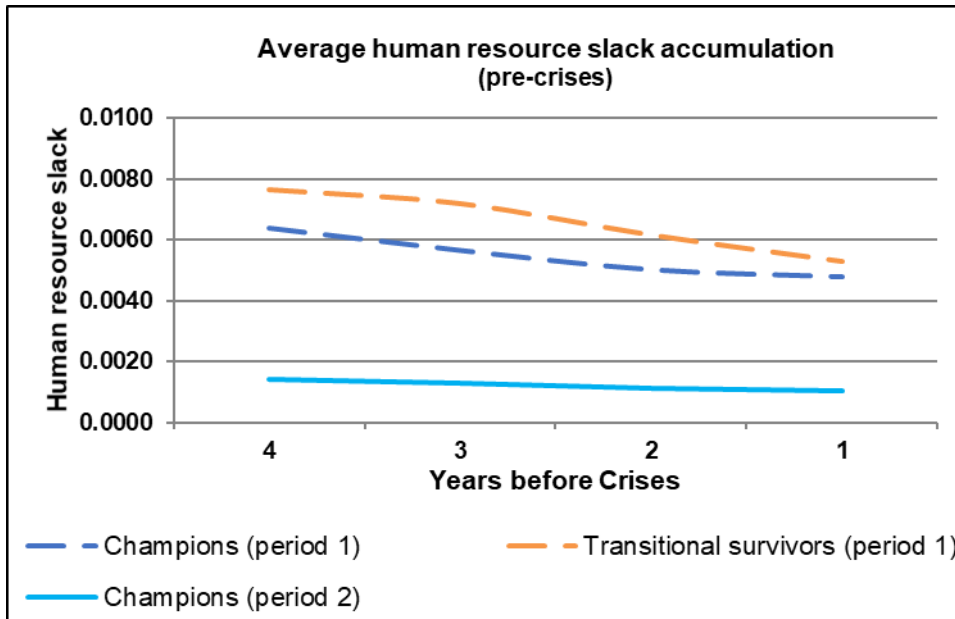
Figure 3 identifies the range or degree of flexibility of the accumulated human resource slack over the pre-crisis periods.

Figure 3: Flexibility of human resource accumulation in pre-crisis periods

Average human resource slack flexibility

Champions (period 2)   0.0004

Champions (period 1)   0.0016

Transitional survivors (period 1)   0.0023

Range of slack accumulated
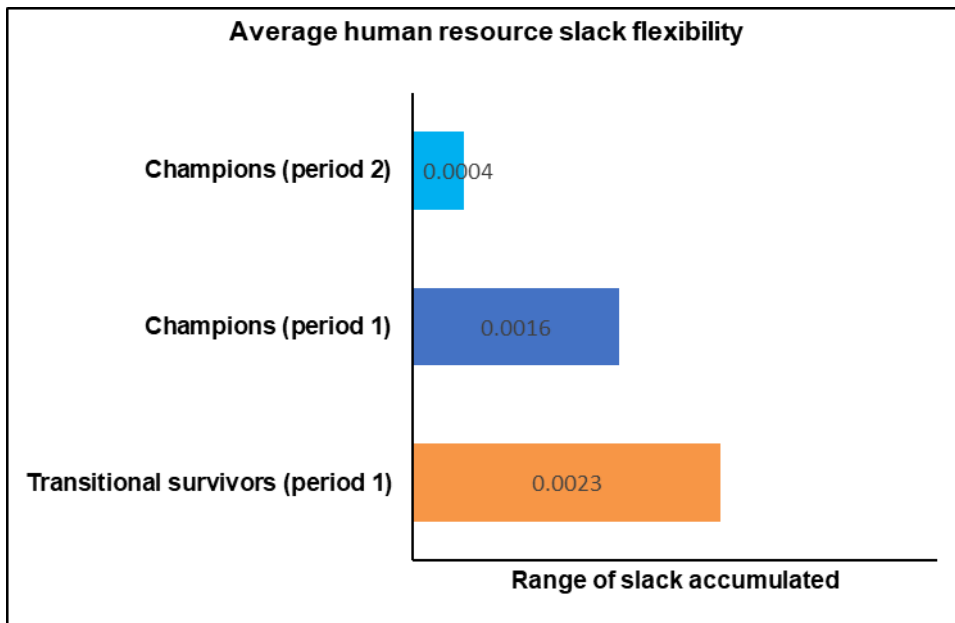
5.5.2. Operational slack

Figure 4 indicates that both the transitional survivors and champions commenced period one with elevated and similar levels of accumulated capacity slack, however, these levels are observed to vary during the pre-crisis periods. In period two, the champions show elevated levels of capacity slack compared to the previous period.

Figure 4: Accumulation of capacity slack in pre-crisis periods

Average capacity slack accumulation (pre-crises)

Capacity slack

0.195
0.180
0.165
0.150
0.135
0.120

4   3   2   1
Years before Crises

— — Champions (period 1)   — — Transitional survivors (period 1)

—— Champions (period 2)
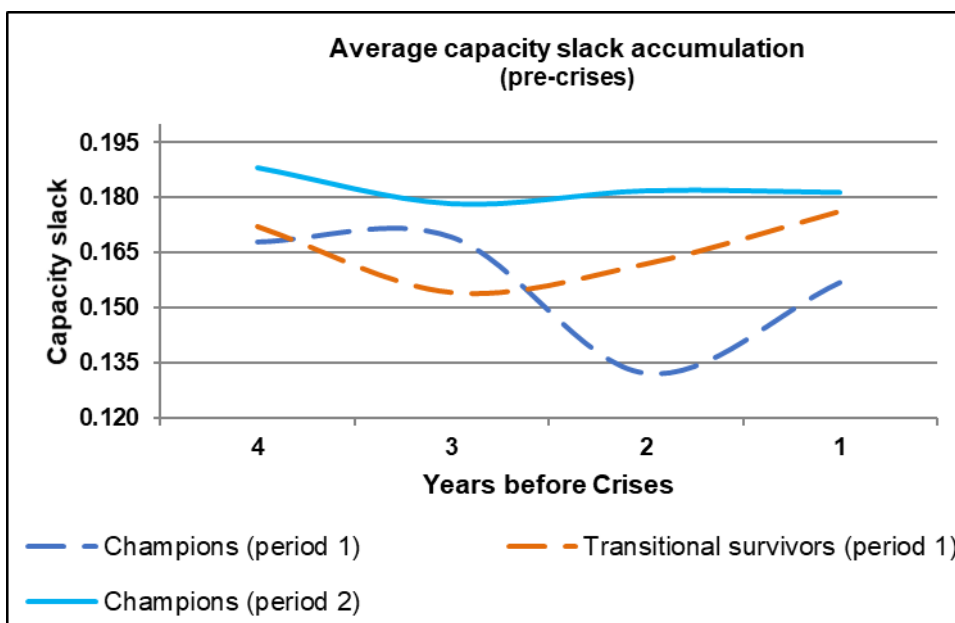
Figure 5 reflects the range of flexibility of accumulated capacity slack within the firms over the pre-crisis periods.

Figure 5: Flexibility of capacity slack in pre-crisis periods

Average capacity slack flexibility

	Range of slack accumulated
Champions (period 2)	0.010
Champions (period 1)	0.037
Transitional survivors (period 1)	0.022
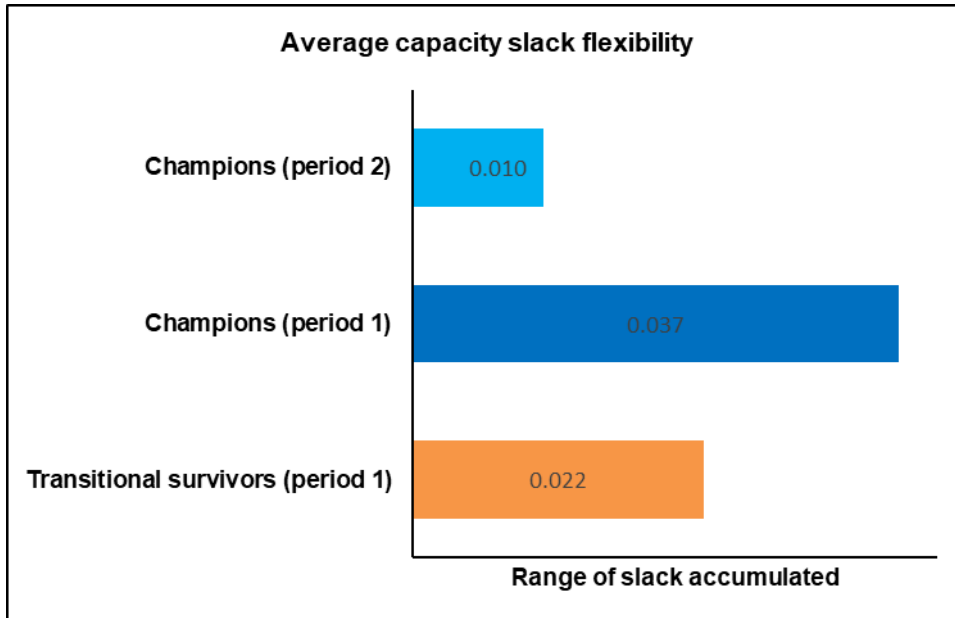
Figure 6 depicts an almost constant state in supply chain slack accumulation in both the champions and transitional survivors over the years for period one; the transitional survivor's slack levels are observed to be slightly more elevated. The champions in period two show lower slack levels than their slack accumulation in period one.

Figure 6: Accumulation of supply chain slack in pre-crisis periods

Average supply chain slack accumulation

— – Champions (period 1)   — – Transitional survivors (period 1)
— Champions (period 2)
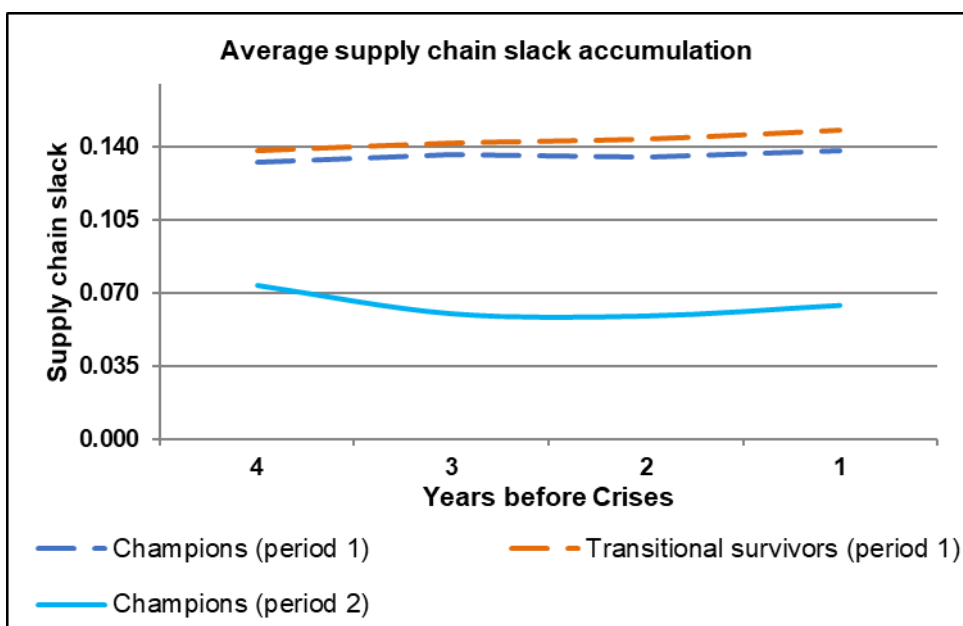
Figure 7 indicates the degree of flexibility of accumulated supply chain slack within the firms over the pre-crisis periods.

Figure 7: Flexibility of supply chain slack in pre-crisis periods

Average supply chain slack flexibility

	Range of slack accumulated
Champions (period 2)	0.015
Champions (period 1)	0.005
Transitional survivors (period 1)	0.010
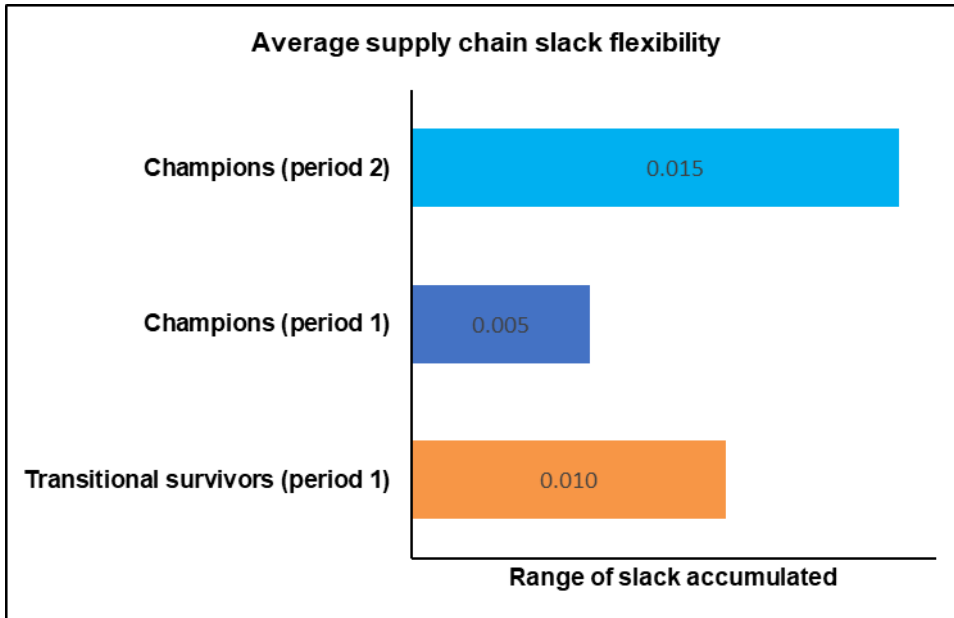
5.5.3. Financial slack

The unabsorbed indicator of financial slack in pre-crisis period one indicates that the champions commenced at lower levels of slack when compared to the transitional survivors in period one, while the champions in period two commence at much higher levels of slack which decumulates over the pre-crisis periods (Figure 8).

Figure 8: Accumulation of unabsorbed financial slack in pre-crisis periods

Average unabsorbed slack accumulation

Unabsorbed slack (y-axis: 0.140, 0.165, 0.190, 0.215, 0.240)

Years before Crises (x-axis: 4, 3, 2, 1)

— – Champions (period 1)   — – Transitional survivors (period 1)
—— Champions (period 2)
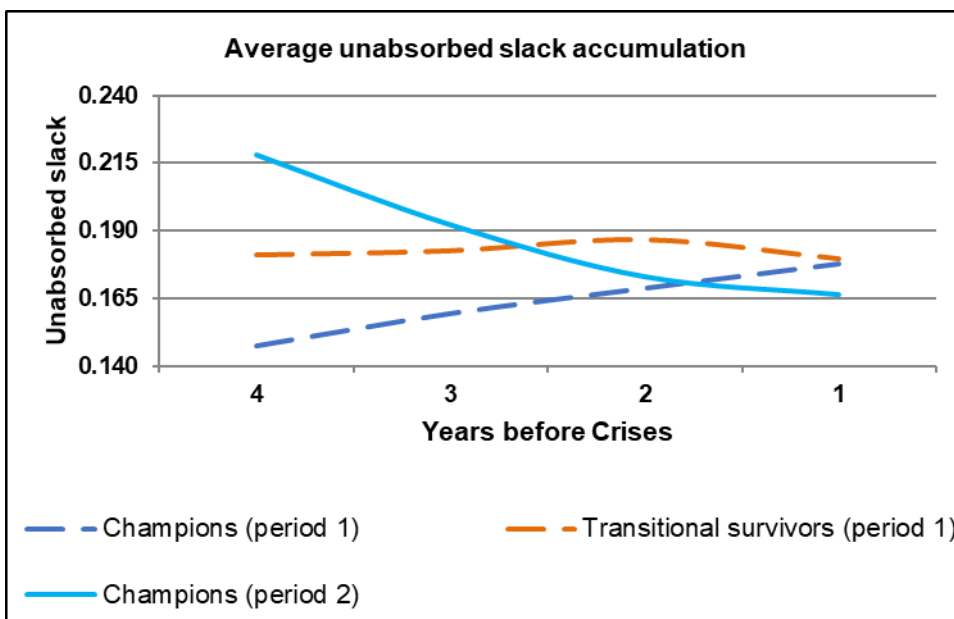
Figure 9 indicates a comparative range of accumulated unabsorbed slack within the firms over both pre-crisis periods.

Figure 9: Flexibility of unabsorbed slack in pre-crisis periods

Average unabsorbed slack flexibility

Champions (period 2): 0.052
Champions (period 1): 0.031
Transitional survivors (period 1): 0.007

Range of slack accumulated
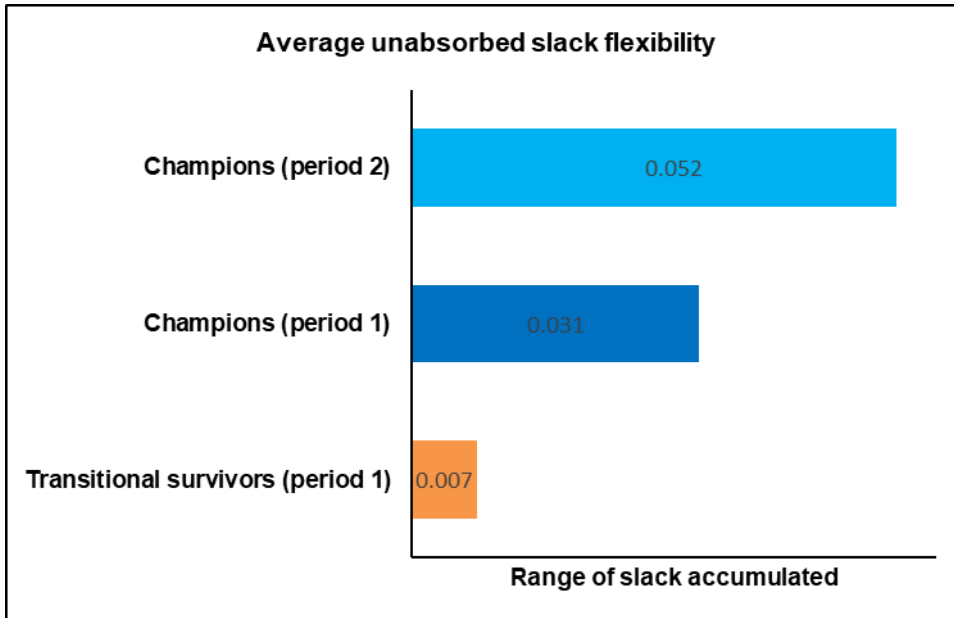
The available financial slack indicator, presented in Figure 10, shows that on average the champions accumulated less slack than the transitional survivors in period one. The champions in period two indicated a higher level of accumulation at the start of the pre-crisis period.

Figure 10: Accumulation of available financial slack in pre-crisis periods

Average available slack accumulation

Available slack (y-axis): 1.350, 1.400, 1.450, 1.500, 1.550
Years before Crises (x-axis): 4, 3, 2, 1

Legend:
— — Champions (period 1)
— — Transitional survivors (period 1)
—— Champions (period 2)
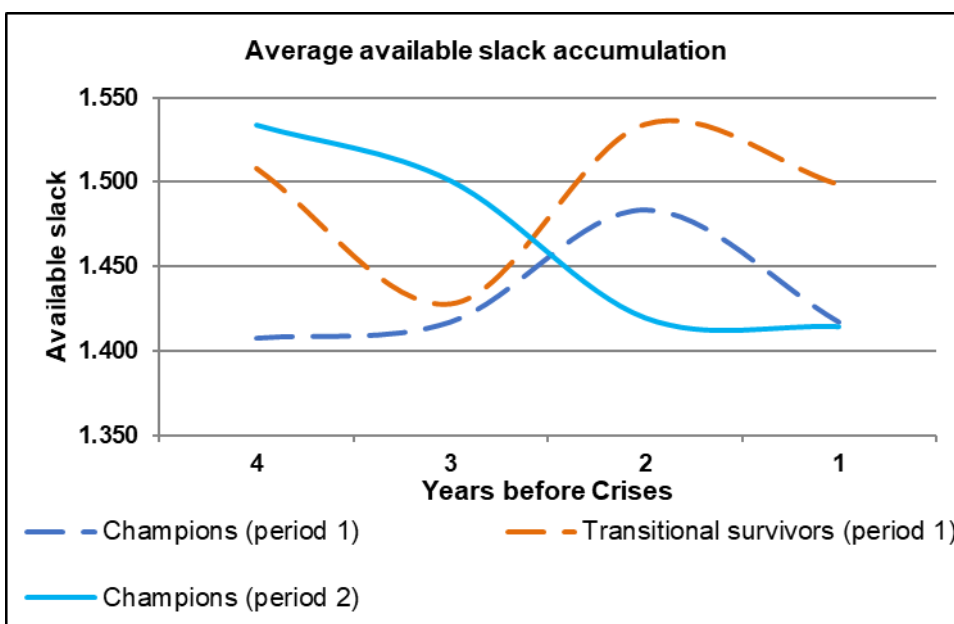
Figure 11 indicates a comparative flexibility in accumulated available slack within the firms over the pre-crisis periods.

Figure 11: Flexibility of available financial slack in pre-crisis periods
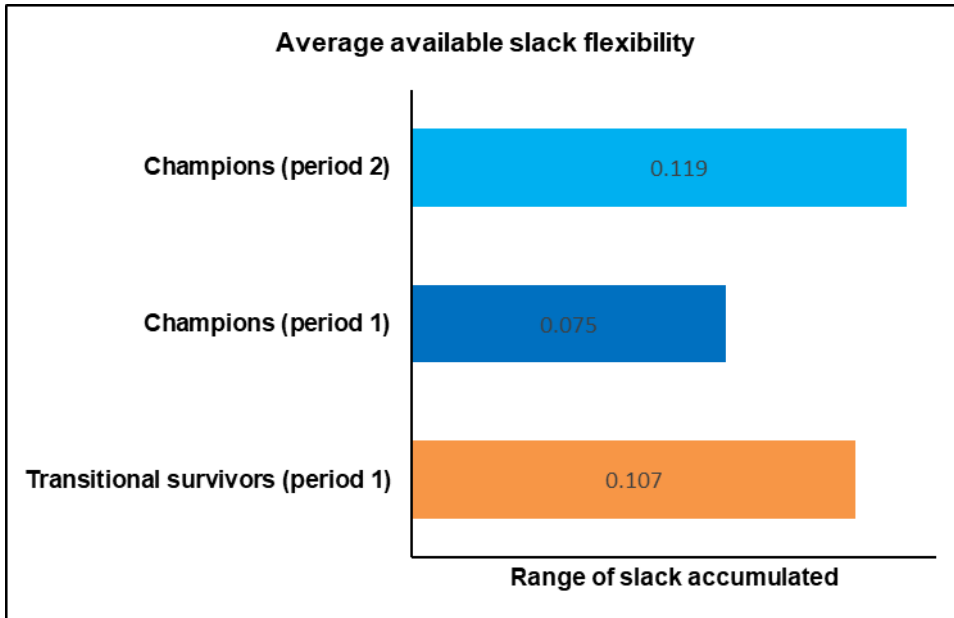
Figure 12 portrays gradual variations in slack over the pre-crisis periods within the transitional survivors in period one and the champions in periods one and two.

Figure 12: Accumulation of absorbed financial slack in pre-crisis periods
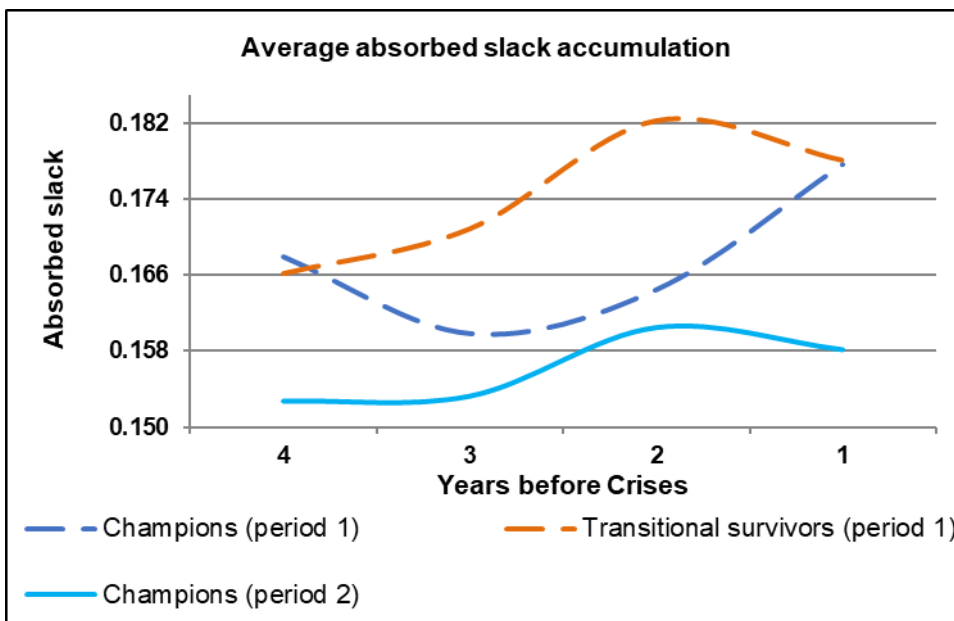
Figure 13 indicates the industry benchmark and comparative range in absorbed financial slack flexibility during period one and period two.

Figure 13: Flexibility of absorbed financial slack in pre-crisis periods
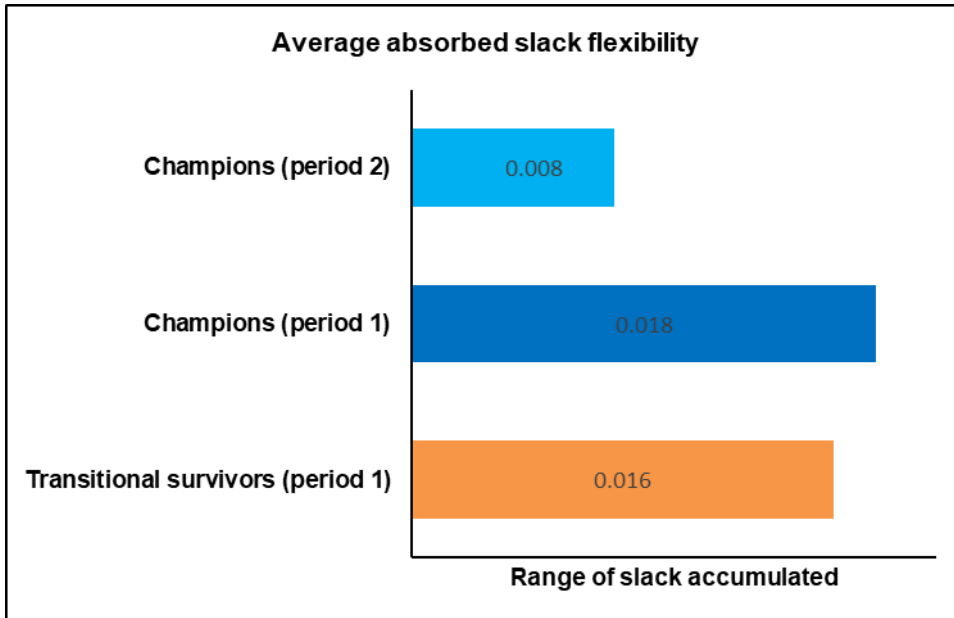
The potential financial slack indicator is inversely related to financial slack (refer to Table 2) where a decrease in the indicator signals an increase in financial slack. Firms commence the pre-crisis periods at different slack levels. However, these levels tend to converge in the year approaching the crises (Figure 14).

Figure 14: Accumulation of potential financial slack in pre-crisis periods
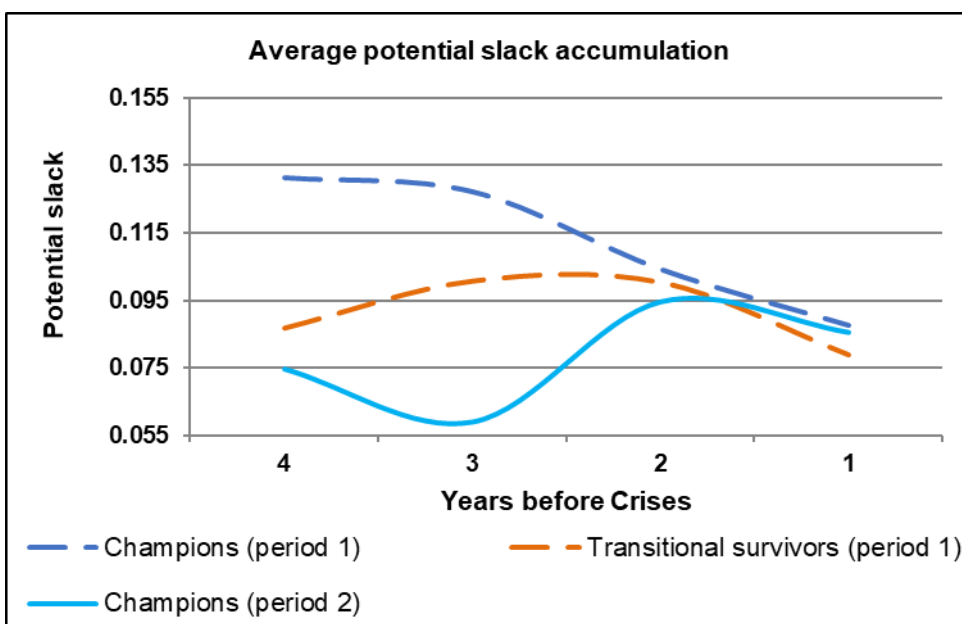
Figure 15 indicates the range and flexibility of the potential financial slack indicator within the pre-crisis periods of the research design.

Figure 15: Flexibility of potential financial slack in pre-crisis periods
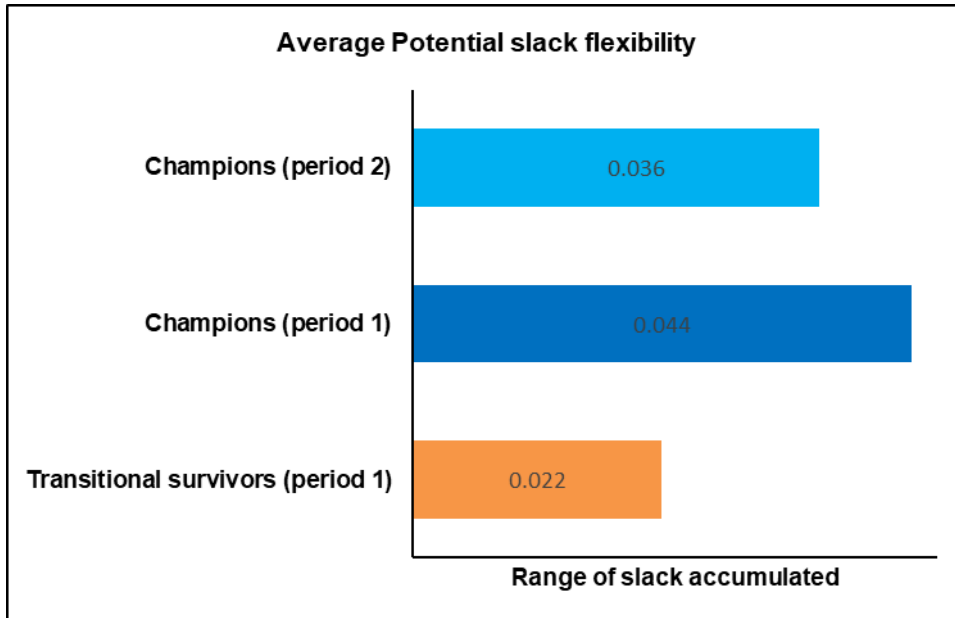
Table 8 presents a summary of the graphical presentations observed in section 5.5; the minimum and maximum slack which the firms accumulated measured by their relative categories or indicators.

Table 8: Comparison of slack ranges

Resource Slack	Indicator	Description	Pre-Crisis Period 1 (1990-1993)	Pre-Crisis Period 2 (2004-2007)
Accumulation of human resource slack		Champions	.0048 - .0064	.0010 – .0014
		Transitional survivors	.0053 – .0076	
Accumulation of operational slack	Capacity slack	Champions	.132 - .169	.178 - .188
		Transitional survivors	.154 - .176	
	Supply chain slack	Champions	.133 - .138	.059 - .074
		Transitional survivors	.138 - .148	
Accumulation of financial slack	Unabsorbed slack	Champions	.147 - .178	.166 - .218
		Transitional survivors	.180 - .187	
	Available slack	Champions	1.408 - 1.483	1.428 - 1.534
		Transitional survivors	1.415 - 1.534	
	Absorbed slack	Champions	.160 - .178	.153 - .161
		Transitional survivors	.166 - .182	
	Potential slack	Champions	.088 - .131	.079 - .101
		Transitional survivors	.059 - .095	

5.6. Correlation analysis results

Correlation analysis was conducted in the post-crisis periods to identify whether any relationship existed between the three main resource slacks and their corresponding firm performance. Table 9 provides a summary of the different slack indicators and their respective performance measures. Tables 10, 11 and 12 represent the correlations within the transitional survivors and champions of period one and the champions of period two. Descriptive statistics of means and standard deviations were removed from the correlation matrices due it being discussed in section 5.4. The control variables, more specifically the pre-crisis performance measures, proved to have significant correlations on firm performance as suggested by the literature and can be found detailed in Appendix 4.

Table 9: Summary of slack indicators and performance measures

Slack Indicator	Performance measure
Human resource slack	$\left(\dfrac{gross\ profit}{total\ assets}\right)$
Operational slack • Capacity slack • Supply chain slack	$\left(\dfrac{net\ income}{total\ assets}\right)$
Financial slack • Unabsorbed slack • Available slack • Absorbed slack • Potential slack	$\left(\dfrac{gross\ profit}{total\ assets}\right)$

The significance of the correlations between slack and their respective firm performances within the transitional survivors of period one was identified within the correlation matrix (Table 10). All correlation tests were conducted at a 5% level of significance.

Table 10: Correlation matrix of transitional survivors (period one)

	Variables	1	2	3	4	5	6	7	8	9
1	Gross profit performance measure (post-crisis)	-								
2	ROA performance measure (post-crisis)	.673*	-							
3	Human resource slack	-.306*	-.345*	-						
4	Capacity slack	-.299*	-.120	.114	-					
5	Supply chain slack	.108	.018	-.021	-.339*	-				
6	Unabsorbed slack	.136	.056	-.148	-.392*	.751*	-			
7	Available slack	-.086	-.059	-.041	-.214*	.638*	.689*	-		
8	Absorbed slack	-.012	-.150	.196	-.178	.414*	.377*	.382*	-	
9	Potential slack	-.018	-.133	.135	.025	.094	-.054	-.057	.138	-

*Marked correlations are significant at $p < .050$.

A summary of the statistical analysis is as follows.

- Human resource slack
    - r(78) = -.306, p = .006.
    - There is sufficient evidence, at a 5% level of significance to reject the null hypothesis in favour of the alternative hypothesis; there is a negative, weak and significant correlation between human resource slack and firm performance.

- Capacity slack
    - r(106) = -.120, p = .222.
    - There is sufficient evidence, at a 5% level of significance to accept the null hypothesis; there is a very weak and insignificant correlation between capacity slack and firm performance.

- Supply chain slack
    - $r(106) = .018$, $p = .852$.
    - There is sufficient evidence, at a 5% level of significance to accept the null hypothesis; there is a weak and insignificant correlation between supply chain slack and firm performance.

- Unabsorbed slack
    - $r(112) = .136$, $p = .153$.
    - There is sufficient evidence, at a 5% level of significance to accept the null hypothesis; there is a very weak and insignificant correlation between unabsorbed financial slack and firm performance.

- Available slack
    - $r(112) = -.086$, $p = .368$.
    - There is sufficient evidence, at a 5% level of significance to accept the null hypothesis; there is a very weak and negative and insignificant correlation between available financial slack and firm performance.

- Absorbed slack
    - $r(106) = -.012$, $p = .905$.
    - There is sufficient evidence, at a 5% level of significance to accept the null hypothesis; there is a very weak inverse and insignificant correlation between absorbed financial slack and firm performance.

- Potential slack
    - $r(112) = -.018$, $p = .851$.
    - There is sufficient evidence, at a 5% level of significance to accept the null hypothesis; there is a very weak, inverse and insignificant correlation between capacity slack and firm performance.

To summarise, human resource slack and its firm performance was the only significant relationship identified when compared to the other slack and performance variables. There were very weak relationships which also proved insignificant, between the different slack measures and their respective performance measures in the transitional survivors for period one.

It is also worth noting, that there are several moderate to strong correlations between the slack indicators and the different performance measures which proved significant.

Human resource slack indicated a negative, weak but significant correlation with the ROA performance measure:
- $r(78) = -.345$, $p = .002$.

Capacity slack was observed to have a negative, weak inverse relationship with the gross profit performance measure:
- $r(106) = .299$, $p = .002$.

Supply chain slack also shared a negative, weak and significant correlation with capacity slack:
- $r(106) = -.339$, $p < .001$.

There is also a strong and significant correlation between both performance measures:
- $r(112) = .674$, $p < .001$.

The correlations observed within the champions of period one is displayed in Table 11 and the statistical analysis is summarised thereafter.

Table 11: Correlation matrix of the survival champions (period one)

	Variables	1	2	3	4	5	6	7	8	9
1	Gross profit performance measure (post-crisis)	-								
2	ROA performance measure (post-crisis)	.694*	-							
3	Human resource slack	-.284	-.179	-						
4	Capacity slack	-.123	.042	.596*	-					
5	Supply chain slack	.116	.087	-.032	-.268	-				
6	Unabsorbed slack	.077	.021	-.086	-.444*	.701*	-			
7	Available slack	-.041	-.003	.032	-.305*	.650*	.899*	-		
8	Absorbed slack	.110	.088	-.032	-.146	.563*	.355*	.265	-	
9	Potential slack	-.086	-.173	.147	.008	-.033	.059	.026	.168	-

* Marked correlations are significant at $p < .050$.

- Human resource slack
    - r(39) = -.284, p = .080.
    - There is sufficient evidence, at a 5% level of significance to accept the null hypothesis; there is a negative, weak and insignificant correlation between human resource slack and firm performance.

- Capacity slack
    - r(52) = .042, p = .770.
    - There is sufficient evidence, at a 5% level of significance to accept the null hypothesis; there is a very weak and insignificant correlation between capacity slack and firm performance.

- Supply chain slack
    - r(52) = .087, p = .541.
    - There is sufficient evidence, at a 5% level of significance to accept the null hypothesis; there is a very weak and insignificant correlation between supply chain slack and firm performance.

- Unabsorbed slack
    - r(53) = .077, p = .586.
    - There is sufficient evidence, at a 5% level of significance to accept the null hypothesis; there is very weak and insignificant correlation between unabsorbed financial slack indicator and firm performance.

- Available slack
    - r(53) = -.041, p = .769.
    - There is sufficient evidence, at a 5% level of significance to accept the null hypothesis; there is a very weak, negative and insignificant correlation between available financial slack indicator and firm performance.

- Absorbed slack
    - r(52) = .110, p = .439.
    - There is sufficient evidence, at a 5% level of significance to accept the null hypothesis; there is a very weak and insignificant correlation between absorbed the absorbed slack indicator and firm performance.

- Potential slack
    - $r(53) = -.086$, $p = .538$.
    - There is sufficient evidence, at a 5% level of significance to accept the null hypothesis; there is a very weak, inverse and insignificant correlation between potential slack indicator and firm performance.

In summary, there were weak relationships which also proved insignificant between the different slack measures and their respective performance measures within the champions for period one.

It is prudent to note, however, that there are some moderate to strong correlations which proved significant, between the slack indicators themselves. The most significant and highly correlated indicators being available slack when measured against unabsorbed slack:
- $r(53) = .899$, $p < .001$.

There is also a strong and significant correlation between both performance measures:
- $r(53) = .694$, $p < .001$.

Table 12 indicates the correlations for the champions within period two and the statistical analysis is summarised thereafter.

Table 12: Correlation matrix of the survival champions (period two)

	Variables	1	2	3	4	5	6	7	8	9
1	Gross profit performance measure(post-crisis)	-								
2	ROA performance measure (post-crisis)	.783*	-							
3	Human resource slack	-.100	-.212	-						
4	Capacity slack	-.163	-.094	.183	-					
5	Supply chain slack	-.035	.127	.259	-.068	-				
6	Unabsorbed slack	-.023	-.059	.187	-.317*	.497*	-			
7	Available slack	.054	-.079	.497*	-.077	.471*	.821*	-		
8	Absorbed slack	-.467*	-.245	.127	.329*	.119	.014	.089	-	
9	Potential slack	-.295*	-.318*	-.200	.313*	-.336*	-.360*	-.321*	.260	-

* Marked correlations are significant at $p < .050$.

- Human resource slack
    - r(51) = -.100, p = .484.
    - There is sufficient evidence, at a 5% level of significance to accept the null hypothesis; there is a very weak, negative and insignificant correlation between human resource slack and firm performance.

- Capacity slack
    - r(53) = -.094, p = .502.
    - There is sufficient evidence, at a 5% level of significance to accept the null hypothesis; there is a very weak, inverse and insignificant correlation between capacity slack and firm performance.

- Supply chain slack
    - $r(53) = .127$, $p = .366$.
    - There is sufficient evidence, at a 5% level of significance to accept the null hypothesis; there is a very weak and insignificant correlation between supply chain slack and firm performance.

- Unabsorbed slack
    - $r(112) = .136$, $p = .153$.
    - There is sufficient evidence, at a 5% level of significance to accept the null hypothesis; there is a very weak and insignificant correlation between unabsorbed financial slack and firm performance.

- Available slack
    - $r(53) = .054$, $p = .700$.
    - There is sufficient evidence, at a 5% level of significance to accept the null hypothesis; there is a very weak and insignificant correlation between available financial slack and firm performance.

- Absorbed slack
    - $r(53) = -.467$, $p < .001$.
    - There is sufficient evidence, at a 5% level of significance to reject the null hypothesis in favour of the alternative; there is a moderate, inverse and significant correlation between absorbed financial slack and firm performance.

- Potential slack
    - $r(53) = -.295$ $p = .032$.
    - There is sufficient evidence, at a 5% level of significance to reject the null hypothesis in favour of the alternative; there is a weak, inverse and significant correlation between potential slack and firm performance.

In summary, the champions in period two displayed weak relationships which also proved insignificant between the different slack measures and their respective performance measures.

Again, it is prudent to note, however, that there are some moderate to strong correlations which proved significant, between the slack indicators themselves. The most significant and highly correlated indicators being available slack when measured against unabsorbed slack:

- $r(53) = .821$, $p < .001$.

There is also a strong and significant correlation between both performance measures:

- $r(53) = .783$, $p < .001$.

It is noted that there is a strong correlation between unabsorbed and available slack, suggesting that these indicators for unabsorbed slack can be used interchangeable which is validated by the fact that they measure the same type of financial slack (refer to Table 3). As a result, the available slack indicator was used as the measure for unabsorbed financial slack when running the multiple linear regression analysis.

5.7. Multicollinearity results

Despite using panel data, collinearity checks were still conducted between the variables, within each period, to ensure the robustness of the data to be utilised for the regression analysis. The results are observed in Appendix 5 and are well within the limits of one and ten.

5.8. Regression results of post-crisis analysis

To test hypothesis one, two and three, multiple linear regression analysis was employed in each period, and within each group, to quantify the strength of the various slack indicators and their respective performance measures. Table 13 indicates a summary of the various models used in the regression table.

Table 13: Summary of models used in regression analysis

	Period 1		Period 2
	Transitional survivors	**Champions**	**Champions**
Standard regression	Model 1	Model 2	Model 3

All regressions were conducted at a 5% level of significance; the results are presented in Table 14, followed by a statistical summary in section 5.8.1.

Table 14: Multiple linear regression analysis

Variables	Model 1	Model 2	Model 3
Gross profit performance measure			
intercept	.101 (.044)*	.191 (.071)*	-.037 (.100)
Human resource Slack	-2.057 (1.092)	-1.601 (1.792)	-19.610 (9.704)*
Available Slack	.015 (.010)	.003 (.018)	.021 (.017)
Absorbed Slack	.053 (.047)	.115 (.134)	.014 (.141)
Potential Slack	-.056 (.032)	.002 (.051)	-.102 (.056)
Control variables			
Firm Size	-.003 (.004)	-.009 (.006)	.008 (.007)
Firm Age	.002 (.007)	-.009 (.010)	.015 (.019)
Intangible Assets ratio	-.115 (.063)	-.070 (.110)	.017 (.122)
Gross profit performance measure (pre-crisis)	.471 (.075)***	.427 (.147)**	1.101 (.176)***
ROA performance measure (pre-crisis)	.142 (.121)	.476 (.250)	-1.040 (.243)***
ROA performance measure			
intercept	.011 (.030)	.017 (.039)	.007 (.057)
Capacity Slack	-.016 (.018)	.005 (.015)	-.013 (.024)

Supply Chain Slack	.007 (.031)	.049 (.041)	.071 (.039)
Control variables			
Firm Size	.001 (.003)	.000 (.003)	.000 (.004)
Firm Age	.005 (.005)	.003 (.005)	.009 (.012)
Intangible Assets ratio	-.108 (.045)*	.063 (.061)	.074 (.076)
Gross profit performance measure (pre-crisis)	.119 (.058)*	.081 (.089)	.250 (.105)*
ROA performance measure (pre-crisis)	.375 (.090)***	.584 (.147)***	-.106 (.159)

Standard errors reported in parenthesis.

*** $p<.001$, ** $p<.010$, and * $p<.050$.

5.8.1. Testing the regression models for significance

Model 1

- Slack variables and the gross profit measure.
    - $R^2 = .576$, $F(9,66) = 9.604$, $p < .001$.
    - There is sufficient evidence, at a 5% level of significance to reject the null hypothesis in favour of the alternative; the regression model is significant.
    - This is a useful model in the context of this research where 57.6% of the total variation in the gross profit performance measure, can be collectively explained by human resource and financial slack indicators.

- Slack variables and the ROA measure.
    - $R^2 = .404$, $F(7,68) = 6.595$, $p < .001$.
    - There is sufficient evidence, at a 5% level of significance to reject the null hypothesis in favour of the alternative; the regression model is significant.
    - This is a useful model in the context of this research where 40.4% of the total variation in the ROA performance measure can be collectively explained by the operational slack indicators.

Model 2

- Slack variables and the gross profit measure.
    - $R^2 = .626$, $F(9,29) = 5.395$, $p < .001$.
    - There is sufficient evidence, at a 5% level of significance to reject the null hypothesis in favour of the alternative; the regression model is significant.
    - This is a useful model in the context of this research where 62.6% of the total variation in the gross profit performance measure, can collectively be explained by human resource and financial slack indicators.

- Slack variables and the ROA measure.
    - $R^2 = .574$, $F(7,31) = 5.963$, $p < .001$.
    - There is sufficient evidence, at a 5% level of significance to reject the null hypothesis in favour of the alternative; the regression model is significant.
    - This is a useful model in the context of this research where 57.4% of the total variation in the ROA performance measure can be collectively explained by the operational slack indicators.

Model 3

- Slack variables and the gross profit measure.
    - $R^2 = .665$, $F(9,41) = 9.034$, $p < .001$.
    - There is sufficient evidence, at a 5% level of significance to reject the null hypothesis in favour of the alternative; the regression model is significant.
    - This is a useful model in the context of this research where 66.5% of the total variation in the gross profit performance measure, can collectively be explained by human resource and financial slack indicators.

- Slack variables and the ROA measure.
    - $R^2 = .258$, $F(7,43) = 2,137$, $p = .060$.
    - There is sufficient evidence, at a 5% level of significance to accept the null hypothesis; the regression model is insignificant.

Hypothesis testing was conducted to test the statistical significance of the individual slack regressors on firm performance, post the volatile period. All testing was conducted at a 5% level of significance.

5.8.2. Hypothesis 1: A positive relationship exists between human resource slack and firm performance

Transitional survivors (period one)

- $\beta = -2.057$, $t(75) = -1.884$, $p = .064$.
- There is sufficient evidence, at a 5% level of significance to accept the null hypothesis; human resource slack has no significant positive relationship with firm performance within the transitional survivors in period one.

Champions (period one)

- $\beta = -1.601$, $t(38) = -.893$, $p = .379$.
- There is sufficient evidence, at a 5% level of significance to accept the null hypothesis; human resource slack has no significant positive relationship with firm performance within the champion survivors in period one.

Champions (period two)

- $\beta = -19.61$, t(50) = -2.021, $p = .049$.
- There is sufficient evidence, at a 5% level of significance to reject the null hypothesis in favour of the alternative in terms of significance, however the coefficient shows a negative relationship; human resource slack has a significant negative relationship with firm performance within the champion survivors in period one.

5.8.3. Hypothesis 2: A positive relationship exists between operational slack and firm performance

Transitional survivors (period one): Capacity slack

- $\beta = -.016$, t(75) = -.867, $p = .389$.
- There is sufficient evidence, at a 5% level of significance to accept the null hypothesis; capacity slack has no significant positive relationship with firm performance within the transitional survivors in period one.

Transitional survivors (period one): Supply chain slack

- $\beta = .007$, t(75) = .224, $p = .824$.
- There is sufficient evidence, at a 5% level of significance to accept the null hypothesis; supply chain slack has no significant positive relationship with firm performance within the transitional survivors in period one.

Champions (period one): Capacity slack

- $\beta = .005$, t(38) = .311, $p = .758$.
- There is sufficient evidence, at a 5% level of significance to accept the null hypothesis; capacity slack has no significant positive relationship with firm performance within the champion survivors in period one.

Champion (period one): Supply chain slack

- $\beta = .049$, t(38) = 1.202, $p = .238$.
- There is sufficient evidence, at a 5% level of significance to accept the null hypothesis; supply chain slack has no significant positive relationship with firm performance within the champion survivors in period one.

While the ROA performance measure and slack variables proved insignificant within regression model three, the coefficients were still discussed within the context of this paper.

Champions (period two): Capacity slack

- $\beta = -.013$, $t(50) = -.521$, $p = .605$.
- There is sufficient evidence, at a 5% level of significance to accept the null hypothesis; supply chain slack has no significant positive relationship with firm performance within the champion survivors in period two.

Champions (period two): Supply chain slack

- $\beta = .071$, $t(50) = 1.794$, $p = .080$.
- There is sufficient evidence, at a 5% level of significance to accept the null hypothesis; supply chain slack has no significant positive relationship with firm performance within the champion survivors in period two.

5.8.4. Hypothesis 3: A positive relationship exists between financial slack and firm performance

Transitional survivors (period one): Available slack

- $\beta = .015$, $t(75) = 1.554$, $p = .125$.
- There is sufficient evidence, at a 5% level of significance to accept the null hypothesis; available slack has no significant positive relationship with firm performance within the transitional survivors in period one.

Transitional survivors (period one): Absorbed slack

- $\beta = .053$, $t(75) = 1.112$, $p = .270$.
- There is sufficient evidence, at a 5% level of significance to accept the null hypothesis; absorbed slack has no significant positive relationship with firm performance within the transitional survivors in period one.

Transitional survivors (period one): Potential slack

- $\beta = -.056$, $t(75) = -1.778$, $p = .080$.
- There is sufficient evidence, at a 5% level of significance to accept the null hypothesis; potential slack has no significant positive relationship with firm performance within the transitional survivors in period one.

Champions (period one): Available slack

- $\beta = .003$, t(38) = .153, $p = .880$.
- There is sufficient evidence, at a 5% level of significance to accept the null hypothesis; available slack has no significant positive relationship with firm performance within the champion survivors in period one.

Champions (period one): Absorbed slack

- $\beta = .115$, t(38) = .855, $p = .399$.
- There is sufficient evidence, at a 5% level of significance to accept the null hypothesis; absorbed slack has no significant positive relationship with firm performance within the champion survivors in period one.

Champions (period one): Potential slack

- $\beta = .002$, t(38) = .030, $p = .977$.
- There is sufficient evidence, at a 5% level of significance to accept the null hypothesis; potential slack has no significant positive relationship with firm performance within the champion survivors in period one.

Champions (period two): Available slack

- $\beta = .021$, t(50) = 1.253, $p = .21$.
- There is sufficient evidence, at a 5% level of significance to accept the null hypothesis; available slack has no significant positive relationship with firm performance within the champion survivors in period two.

Champions (period two): Absorbed slack

- $\beta = .015$, t(50) = 102, $p = .919$.
- There is sufficient evidence, at a 5% level of significance to accept the null hypothesis; absorbed slack has no significant positive relationship with firm performance within the champion survivors in period two.

Champions (period two): Potential slack

- $\beta = -.102$, t(50) = -1.809, $p = .078$.
- There is sufficient evidence, at a 5% level of significance to accept the null hypothesis; potential slack has no significant positive relationship with firm performance within the champion survivors in period two.

As necessary with multiple linear regression models, the assumptions behind the models must hold true. Residual scatter plots with regard to the dependent variables have been validated to be homoscedastic and independent across all performance measures and can be found in Appendix 6.

5.9.   Parabolic results of post-crisis periods

To test hypothesis four, five and six, second order polynomial regressions were conducted to first test for the presence of a significant parabolic relationship between the variables. The significant negative squared coefficient strongly indicated the presence of a negative parabolic shaped relationship between the slack variables and their respective firm performance. Table 15 describes the models used and the polynomial regression analysis.

Table 15: Summary of models used in polynomial regression analysis

	Period 1		Period 2
	Transitional survivors	**Champions**	**Champions**
With quadratic terms	Model 4	Model 5	Model 6

The polynomial regressions were conducted at a 5% level of significance; the results are relayed in Table 16, followed by a statistical summary in sections 5.9.1, 5.9.2 and 5.9.3.

Table 16: Polynomial regression analysis

Variables	Model 4	Model 5	Model 6
Gross profit performance measure			
intercept	0.108 (0.038)**	0.163 (0.075)*	-0.061 (0.097)
Human resource slack	-0.140 (0.069)*	-0.016 (0.118)	-0.149 (0.095)
Human resource slack squared	0.005 (0.066)	0.055 (0.129)	-0.017 (0.093)
Available Slack	0.108 (0.064)	0.017 (0.111)	0.130 (0.145)
Available slack squared	0.003 (0.073)	-0.235 (0.127)	-0.052 (0.133)
Absorbed Slack	0.088 (0.068)	0.649 (0.630)	0.002 (0.126)
Absorbed slack squared	-0.074 (0.072)	0.408 (0.396)	-0.034 (0.101)
Potential Slack	-0.103 (0.067)	0.096 (0.113)	-0.160 (0.111)
Potential slack squared	-0.041 (0.064)	0.015 (0.098)	0.074 (0.102)

ROA performance measure

intercept	0.031 (0.010)**	0.031 (0.018)	0.040 (0.019)*
Capacity Slack	-0.053 (0.077)	0.022 (0.050)	-0.035 (0.056)
Capacity slack squared	0.061 (0.079)	-0.046 (0.044)	0.079 (0.051)
Supply Chain Slack	0.004 (0.052)	0.086 (0.075)	0.097 (0.063)
Supply chain slack squared	0.028 (0.053)	-0.007 (0.081)	-0.002 (0.053)

Standard errors reported in parenthesis.

*** $p<.001$, ** $p<.01$, and * $p<.05$.

Hypothesis testing was conducted to test the statistical significance of the β_2 coefficient to determine if a parabolic relationship did exist between slack and performance. All testing was conducting at a 5% level of significance.

5.9.1. Hypothesis 4: A negative parabolic relationship exists between human resource slack and firm performance

Transitional survivors (period one)

- $\beta_2 = .005$, t(75) = .075, *p* = .098.
- There is sufficient evidence, at a 5% level of significance to accept the null hypothesis; human resource slack has no significant negative parabolic relationship with firm performance within the transitional survivors in period one.

Champions (period one)

- $\beta_2 = .055$, t(38) = .423, *p* = .676.
- There is sufficient evidence, at a 5% level of significance to accept the null hypothesis; human resource slack has no significant negative parabolic relationship with firm performance within the champion survivors in period one.

Champions (period two)

- $\beta_2 = -.017$, t(50) = -.180, *p* = .859.
- There is sufficient evidence, at a 5% level of significance to accept the null hypothesis; human resource slack has no significant negative parabolic relationship with firm performance within the champion survivors in period two.

5.9.2. Hypothesis 5: A negative parabolic relationship exists between operational slack Indicators and firm performance

Transitional survivors (period one): Capacity slack

- $\beta_2 = .061$, t(75) = .771, $p = .444$.
- There is sufficient evidence, at a 5% level of significance to accept the null hypothesis; capacity slack has no significant negative parabolic relationship with firm performance within the transitional survivors in period one.

Transitional survivors (period one): Supply chain slack

- $\beta_2 = .028$, t(75) = .532, $p = .597$.
- There is sufficient evidence, at a 5% level of significance to accept the null hypothesis; supply chain slack has no significant negative parabolic relationship with firm performance within the transitional survivors in period one.

Champions (period one): Capacity slack

- $\beta_2 = -.046$, t(38) = -1.047, $p = .305$.
- There is sufficient evidence, at a 5% level of significance to accept the null hypothesis; capacity slack has no significant negative parabolic relationship with firm performance within the champion survivors in period one.

Champions (period one): Supply chain slack

- $\beta_2 = -.007$, t(38) = -.089, $p = .930$.
- There is sufficient evidence, at a 5% level of significance to accept the null hypothesis; supply chain slack has no significant negative parabolic relationship with firm performance within the champion survivors in period one.

Champions (period two): Capacity slack

- $\beta_2 = .079$, $t(50) = 1.534$, $p = .133$.
- There is sufficient evidence, at a 5% level of significance to accept the null hypothesis; supply chain slack has no significant negative parabolic relationship with firm performance within the champion survivors in period two.

Champions (period two): Supply chain slack

- $\beta_2 = -.0002$, $t(50) = -.039$, $p = .970$.
- There is sufficient evidence, at a 5% level of significance to accept the null hypothesis; supply chain slack has no significant negative parabolic relationship with firm performance within the champion survivors in period two.

5.9.3. Hypothesis 6: A negative parabolic relationship exists between financial slack Indicators and firm performance

Transitional survivors (period one): Available slack

- $\beta_2 = .003$, $t(75) = .038$, $p = .970$.
- There is sufficient evidence, at a 5% level of significance to accept the null hypothesis; available slack has no significant negative parabolic relationship with firm performance within the transitional survivors in period one.

Transitional survivors (period one): Absorbed slack

- $\beta_2 = -.074$, $t(75) = -1.029$, $p = .308$.
- There is sufficient evidence, at a 5% level of significance to accept the null hypothesis; absorbed slack has no significant negative parabolic relationship with firm performance within the transitional survivors in period one.

Transitional survivors (period one): Potential slack

- $\beta_2 = -.041$, $t(75) = -.634$, $p = .528$.
- There is sufficient evidence, at a 5% level of significance to accept the null hypothesis; potential slack has no significant negative parabolic relationship with firm performance within the transitional survivors in period one.

Champions (period one): Available slack

- β_2 = -.235, t(75) = -1.852, *p* = .076.
- There is sufficient evidence, at a 5% level of significance to accept the null hypothesis; available slack has no significant negative parabolic relationship with firm performance within the champion survivors in period one.

Champions (period one): Absorbed slack

- β_2 = .408, t(75) = 1.031, *p* = .312.
- There is sufficient evidence, at a 5% level of significance to accept the null hypothesis; absorbed slack has no significant negative parabolic relationship with firm performance within the champion survivors in period one.

Champions (period one): Potential slack

- β_2 = .015, t(75) = .150, *p* = .882.
- There is sufficient evidence, at a 5% level of significance to accept the null hypothesis; potential slack has no significant negative parabolic relationship with firm performance within the champion survivors in period one.

Champions (period two): Available slack

- β_2 = -.052, t(50) = -.394, *p* = .696.
- There is sufficient evidence, at a 5% level of significance to accept the null hypothesis; available slack has no significant negative parabolic relationship with firm performance within the champion survivors in period two.

Champions (period two): Absorbed slack

- β_2 = -.034, t(50) = -.340, *p* = .736.
- There is sufficient evidence, at a 5% level of significance to accept the null hypothesis; absorbed slack has no significant negative parabolic relationship with firm performance within the champion survivors in period two.

Champions (period two): Potential slack

- $\beta_2 = .074$, $t(50) = .725$, $p = .473$.

- There is sufficient evidence, at a 5% level of significance to accept the null hypothesis; potential slack has no significant negative parabolic relationship with firm performance within the champion survivors in period two.

Chapter 6: Discussion of results

6.1.   Introduction

This chapter delves into the detailed discussion of the results presented in Chapter 5. Discussions behind the descriptive statistics, accumulation of slack within pre-crisis periods one and two, the effect of slack on performance and finally analysing the parabolic relationship which is postulated to exist between slack and firm performance. The discussions are aligned with the hypotheses summarised in Chapter 3 and Table 7.

6.2.   Descriptive statistics

Descriptive statistics were conducted to understand the data set; identifying the centrality, variances and distributions of the data pertaining to the resource slack and performance measurements within both periods and both the transitional survivors and champions. This was essential in understanding as changes in the distributions could have affected the findings from the proceeding statistical analyses (Wilcox, 2016).

The positively skewed distributions suggested that some larger extreme values existed within the sample and negatively skewed distributions indicated there were also some smaller extreme values within the sample (Wegner, 2015). This was validated by the Pearson's coefficient of skewness. This indicated that the means were subjected to influence by these extreme values and therefore, following Wilcox (2016), the medians were used as a central location measure to undertake a more conservative approach in the analysis, as the median was not affected by extreme values.

6.3.   Accumulation of slack analysis

Gaur et al. (2014) and Young et al. (2014) suggested that firms which aligned themselves to institutional instructions had better opportunities to successfully acquire and manage their resource bases and as a result encouraged growth and firm performance (Hitt et al., 2011; Sirmon et al., 2011).

Keeping aligned with institutional theory, it was relevant to understand whether the firms which operated in the transitional economy periods focussed their business strategy on the accumulation of resources to mitigate their way through these volatile periods and to understand the degree of flexibility within the firm through its resource base. This was further endorsed by Paeleman and Vanacker (2015) who emphasised the lack of theoretical and empirical work on slack accumulation in an emerging market.

Given that the transitional economy firms, as identified by Van Schoor (2017), had undergone two main transitional periods, it was relevant to first investigate the proposed theory behind the resource-based view of the firm and dynamic capabilities in terms of whether slack was accumulated between the two groups in period one (1990-1998) and whether the champion firms learned to evolve in terms of their slack resource strategy given the context of the environment (Hitt et al., 2011) from period one to period two (2014 – 2012).

Following Gruener and Raastad (2016), transitional survivors and survival champions of period one and the survival champions from period two were investigated to understand whether slack was accumulated before the onset of the two identified crises.

6.3.1. Human resource slack accumulation

The transitional survivor group from period one provided an average benchmark of 0.0023 in terms of human resource accumulation in the four years before the first crises period. It is prudent to note that these transitional survivors showed a higher flexibility in human resource slack over period one than the champions (0.0016), who were well below the suggested industry benchmark. Period two indicated that the champions had a substantially smaller degree of average flexibility (0.0004) than what was experienced in period one.

While Sull (2009) postulated that excess human resource slack created opportunities to recover costs through retrenchments, restructuring and deployment, it was interesting to have discovered that overall, very low levels of human resource slack was accumulated within the sample. There was no obvious trend of accumulating human resource before the onset of either crises.

Dai and Kittilaksanawong (2014) and Lecuona and Reitzig (2014) suggested that there were levels of various expertise within human resource slack; general knowledge or low-level expertise and firm-specific or a high level of expertise.

The low level, or general workers, due to their lack of firm-orientated specialisation and their not necessarily being aligned with the VRIN framework (Lecuona & Reitzig, 2014), could therefore, be considered an expendable resource and could be a reason behind the decumulation observed over the periods within the sample. However, this group of workers also provided a degree of flexibility necessary to help the firm adapt or transition in new environments, which is why there was a theoretical postulation that firms accumulated human resource slack before the onset of a crisis (Wang et al., 2016). Paeleman and Vanacker (2015) also reiterated that while firm-specific workers provided a competitive advantage they could also stifle agility when manoeuvring through transitional periods by not evolving and incorporating new strategies within the new environmental context and this could also negatively affect firm performance; this again could explain the decumulation observed.

Both types human resource expertise was classified as absorbed slack and the slow decumulation of human resource slack observed prior to the onset of the crises could have been an attempt to free up or accumulate other absorbed slack resources which may have been more essential than human resource slack at the time. This would suggest that either type of human resource expertise was released instead of being accumulated prior to the crises (Wang et al., 2016).

As suggested by Lampel et al. (2014), human resource slack was a sticky or low discretionary type of slack, firms could not have accumulated more workers before the onset of a crises as these workers may have remained dormant while waiting to be deployed. This could have resulted in additional costs and potential rigidity within the period (Goerzen & Beamish, 2007) and, due to their dormancy, may have had a long-term negative impact on firm performance (Lecuona & Reitzig, 2014).

In addition, accumulating human resource slack, while not necessary, could have resulted in an inflexible and inefficient organisation, making it difficult for the firm to navigate towards survival during transitional periods (Stan et al., 2014; Teece et al., 2016).

Considering that the transitional survivors from period one accumulated slightly more human resource slack than the champions, it could have suggested that they had incurred more costs which could have given rise to a negative long-term effect on firm performance due to the manager's discretion and resource use (Lockett & Wild, 2013) and could the reason for their failure to survive till period two.

In keeping aligned with dynamics capability theory and learning, it is useful to note that the champions did not focus on accumulating human resource slack during the second pre-crisis period. As suggested by Lau (2011), some firms in transitional economies were at the brink of developing strategies and in keeping aligned with this, specific resources were required. In this context, human resource slack was not a specific resource required within the champion firms and their context at the time. This again refers to discussions about the costs and benefits of human resource slack and suggestions by Lockett and Wild (2013) and Teece et al. (2016), where the champions preferred agility and low costs ahead of the volatile periods. An additional proposal was that the champions acknowledged their survival, well after the first period, without the accumulation and emphasis of human resource slack, this is aligned with Lin and Wu's (2014) suggestion behind making use of past experiences or lessons and adapting those strategies to the current context.

In summary, while human resource slack accumulation was measured at extremely low levels, the survival champions in period one accumulated less slack than the industry benchmark and the survival champions in period two accumulated even less when compared to their accumulation performance in period one. This suggested that transitional survivors and overall champions did not necessarily consider this latent form of slack as a strategy for absorption and agility, as proposed by Sull (2009), but rather that excess staff could have decreased the level of agility required during volatile periods (Stan et al., 2014).

6.3.2. Operational slack accumulation

Operational slack was described by Kovach et al. (2015) as a defensive and versatile resource, allowing a firm to negotiate through supply and demand fluctuations and to ensure that operational efficiency and efficacy was achieved and maintained (Azadegan et al., 2013; Manikas & Patel, 2016). Modi and Mishra (2011) suggested that operational slack was aligned to the VRIN framework, but this again was dependent on the manager's discretion and use of the resource (Lockett & Wild, 2013).

Capacity slack was identified as slack that was stored internally within the firm in the form of tangible assets. This slack was benchmarked at an average range of 0.022 and this benchmark was superseded by the champions in period one (0.037), indicating more flexibility within the period, and then found to decrease substantially in period two (0.010). Overall, the champions and transitional survivors indicated an accumulation of slack at least two years prior to the onset of the crises, suggesting a higher ratio of PPE to sales.

This accumulation in capacity slack observed in period one could have been an investment strategy where the firms could have invested in more PPE to pre-empt any supply-demand variations which one would be expected to encounter during a transitional period (Sull, 2009; Azadegan et al., 2013). This internally accumulated slack also provided both the champions and transitional survivors with absorptive capacity to navigate any unexpected volatility in the market, encouraging their survival in period one (Sull, 2009).

It is necessary however, to acknowledge that while the transitional survivors accumulated more slack than the champions, they did not necessarily survive until period two. This reiterated the notion that the execution, deployment and effect on firm survival is dependent on the manager's discretion, as discussed by the Penrosean theory (Lockett & Wild, 2013). Manikas and Patel (2016) stated that underutilised excess operational slack could have resulted in operational inefficiencies which, again, could have affected firm performance in the long run.

Azadegan et al. (2013) suggested that operational capacity slack was a type of absorbed slack, with that in mind, the decumulation of operational slack experienced two to four years before the period one crisis in both the champions and transitional survivors suggested an accumulation of another form of absorbed slack instead. This was also aligned with cost-cutting during those years to prepare for the crisis (Lin & Wu, 2014).

In period two, the champions had higher levels of capacity slack prior to the crises, however, there was no major variation in accumulation; the slack levels remained constant where there was a relatively stable ratio of PPE to sales. This could have been due to additional costs experienced in period one through accumulating operational slack in the form of capacity slack, as suggested by Azadegan et al. (2013). It is also important to note that some managers may have focussed on not accumulating slack. This strategy was used to decrease costs and to enforce leanness within the organisation with the hopes that it would lead to increased performance. This, however, was suggested to have a short-term effect on performance (Goerzen & Beamish, 2007); negating opportunities for long-term survival and in this case, it could have affected the champion's survival beyond period two.

Operational slack, while observing that it was accumulated between the firms in period one and, while not necessarily accumulated in period two, was still observed at higher levels. This suggested that these firms acknowledged the absorptive and flexible characteristics that operational slack provided (Manikas & Patel, 2016). This change in accumulation within the champions between period one and period two may have also indicated a degree of dynamic learning capability (Azadegan et al., 2013; Lin & Wu, 2014); the champions focussed on maintaining cost levels and activities by not accumulating unnecessary operational slack within the context of period two.

The second indicator of operational slack was supply chain slack, suggested to be stored externally within the supply chain (Manikas & Patel, 2016). This slack indicator can be summarised as cash conversion cycles and inventory levels within the firm (Manikas & Patel, 2016). Supply chain slack was benchmarked at 0.010 by the transitional survivors. The champions in period one were observed to have less flexibility (0.005) when compared to the benchmark in period one. In period two, however, the flexibility observed in the accumulated supply chain slack increased slightly (0.015).

In all three cases, there were no dramatic fluctuations of accumulation or decumulation as was observed within the supply chain indicator. The supply chain slack accumulation remained relatively constant. Interestingly, it is noted that the firms within the sample preferred higher levels of capacity slack than the internally stored supply chain slack.

Cash conversion cycles provided opportunities to improve firm performance but could have also negatively impacted the firm and its performance through treating stakeholders in an undesirable manner through extended delivery to consumers and payments to suppliers (Manikas & Patel, 2016). In some cases, firms protected their supply chain from disruptions by spreading their input risk; firms had multiple suppliers from whom they purchased materials but, as suggested by Lampel et al. (2014), this could have resulted in higher costs.

This could have indicated why the supply chain slack decreased by half within the champions when they approached period two, again indicative of evolving strategies and dynamic learning capabilities (Teece et al., 2016; Lockett & Wild, 2013). In summary, supply chain slack accumulation and said flexibility required a delicate balance of increased slack with increased costs (Lampel et al., 2014).

Azadegan et al. (2013) stated that different operational slack indicators could be easily or difficultly deployed or allocated; PPE associated with capacity slack allows for easy movement of materials or machinery as opposed to the intangible supply chain slack where the associated capital is harder to move due to it being an absorbed type of slack. This provided a robust interpretation as to why the capacity slack indicator was more pronounced than the supply slack indicator within the firms and this slack provided more absorptive and agile forms of strategy when focussing on long-term firm performance and overcoming dynamic economic periods (Sull, 2009; Kovach et al., 2015).

6.3.3. Financial slack accumulation

Bradley et al. (2011a) described financial slack as excess cash reserves within a given year. The three main categories of financial slack were identified as unabsorbed, absorbed and potential slack; with each slack category having its own indicators for measurement (Stan et al., 2014). Two indicators of unabsorbed slack were used to measure financial slack; the unabsorbed indicator which was defined by the free liquid cash and the available financial slack indicator which was indicative of resources which were unused and were immediately accessible (Stan et al., 2014).

The transitional survivors had set the unabsorbed financial slack benchmark at 0.007; a very low degree of flexibility. The champions in period one were observed to have a higher range of flexibility (0.031) and this was seen to increase within the champions in period two (0.052) as they had accumulated a higher degree of slack at the start of the period.

This low range in unabsorbed flexibility within the transitional survivors was due to their lack of accumulation or decumulation during the pre-crisis periods; the slack remained constant and this could have been a result of poor management (Bradley et al., 2011a). This indicated that the transitional survivors may not have had the necessary rainy-day funding required to overcome the economic volatility associated with period one; they had limited financial flexibility to adapt, explore new opportunities or sustain a long-term performance (Gruener & Raastad, 2016; Kim & Bettis, 2014).

This contrasted with the champions within period one which showed a steady accumulation of unabsorbed slack within the pre-crisis period. This suggested that these champions were focussed on creating a savings-buffer ahead of the transition from Apartheid and were focussed on long-term performance and survival (Gruener & Raastad, 2016).

This behaviour was again observed in period two; the champions had accumulated a high degree of unabsorbed slack at the start of the pre-crisis period and this slack was slowly released before the onset of the global financial crisis. Kim and Bettis (2014) suggest that firms which have accumulated high levels of financial slack created a platform for competitive advantage and this also allowed firms to innovate and experiment more, garnering strategic flexibility to navigate volatility (Hitt et al., 2011).

This was also indicative of dynamic learning capabilities (Lin & Wu, 2014) within the champions when comparing how slack was accumulated or decumulated between the two periods. Paeleman and Vanacker (2015) suggested that firms required different levels of slack and different forms of usage depending on the firm's stage of development and its context; this was observed within the champions in both periods based on the level of accumulation and decumulation detected.

It is also prudent to note that Vanacker et al. (2013) suggested that the accumulation or use of slack should be aligned with the behavioural theory of the firm; while excess slack or a strong balance sheets may have encouraged flexibility for exploration (Sull, 2009), this excess slack could also have encouraged managers to make more risky decisions (Vanacker et al., 2013) due to the freedom and flexibility that slack provides.

Within the transitional survivors, the available slack benchmark was established at 0.107. The champions retained a flexible range of 0.075, lower than benchmark. However, upon reaching period two, these champions increased their range above the benchmark and their period one accumulation (0.119).

While both groups within period one showed accumulation and decumulation of available slack during the pre-crisis periods, the champions in period two showed a similar trend to that of the unabsorbed indicator; a decumulation of slack over the pre-crisis period. Again, as suggested by Kim and Bettis (2014), Sull (2009) and Vanacker et al. (2013), these champions were afforded the opportunity to experiment, explore and maintain a competitive advantage post the crises periods, considering their 23-year survival over the transitional periods (Van Schoor, 2017).

Absorbed slack was measured by the absorbed or recoverable slack indicators which were defined by resources which were committed as excess costs (Stan et al., 2014). The transitional survivors of period one established a benchmark of 0.016. The champions in period one had a slightly higher flexibility than that of the benchmark (0.018), however, the flexibility was noted to decrease in period two (0.008).

Absorbed slack in both the transitional survivors and the champions, in period one, increased slightly in relative alignment with the decumulation of human resource slack and capacity or operational slack; a corresponding increase in capacity slack was observed when the decumulation of absorbed slack occurred. This was justified by Wang et al. (2016) and Azadegan et al. (2013) who identified that these slacks were defined as an absorbed type of resource slack.

Finally, potential slack was measured by the risk or gearing ratio which described whether the firm had the opportunity to obtain external resources or financing (Stan et al., 2014). The potential slack indicator was inversely related to financial slack; a decrease in the potential slack ratio suggested an increase in financial slack, as was defined in Table 2. The transitional survivors of period one created a potential slack benchmark of 0.022; this was superseded by the champions within period one (0.044) and by period two a slight decrease in the potential slack range was observed within the champions (0.036).

Since there is an inverse relationship between the potential slack indicator and financial slack it was prudent to note that the champions within period one and two both showed a decumulation in potential slack indicating an increased opportunity for external borrowing of funds (Stan et al., 2014). A more gradual decumulation was noted within the transitional survivors suggesting that they did not necessarily have the appropriate gearing ratio or relied on potential slack to overcome period one.

6.3.4. Summary

Gruener and Raastad (2016) suggested that firms which accumulated slack before the onset of a crisis tended to have a substantial competitive advantage to gain long-term performance after the crisis. The firms did not show a specific on-going trend of accumulation over the years; slack was both accumulated and decumulated suggesting a level of flexibility to experiment within those periods (Sull, 2009).

Within a South African context, it was observed that capacity slack and financial slack, in the form of unabsorbed slack (unabsorbed and available slack indicators) were the preferred or more prominent types of accumulated resource slack. Firms also actively focussed on accumulating potential slack, capacity slack and absorbed slack while releasing unabsorbed slack (more-so within the champions in period two).

Bradley et al. (2011a), Stan et al. (2014) and Sull (2009) suggested that this release of slack could have been a diversification strategy; diversifying current portfolios, focussing on market innovations and exploration to overcome any unexpected challenges in the post-crisis periods. This behaviour, again, reverts to the behavioural theory of the firm which could be the underlying theory as to why the champions survived. The slack which was accumulated the least within both periods and groups was human resource slack; aside from the reasonings suggested, this could have also been due to missing variables within the data set.

It is essential to acknowledge, as suggested by Kim and Bettis (2014) and Vanacker et al. (2013) that using slack as a competitive advantage for long-term performance was dependent on the manager's discretion and aspects of agency and entrepreneurial behaviour. This could have explained why the period one transitional survivors did not survive till the second period; they were not necessarily focussed on the long-term aspect of firm performance (Gruener & Raastad, 2016; Lampel et al., 2014; Stan et al., 2014).

Another postulation by Wang et al. (2016) stated that firms which lacked excess financial cash could have experienced divestments, fund shortages and perhaps insolvency. This would apply to the transitional survivors of period one where the firms could not survive after the first volatile crisis.

Agency theory was again reiterated by Pierce and Aguinis, (2013) and Tan and Peng (2003) where firms that accumulated slack for the wrong reasons encouraged value-destroying activities such as poor investments. This is opposed to the adapting and exploring for longer-term benefits and using slack to positively affect performance as noted in the slack accumulation trend of the champions.

Lampel et al. (2014) suggested that, while economic crises amplified the importance behind a firm's ability to withstand economic volatility, these transitional survivors did not build up resilience in the form of effective slack accumulation or utilisation.

This could have been the reason for their demise entering the years preceding the global financial crisis. As suggested by Sirmon et al. (2011), firms needed to first accumulate the necessary amount of resources and understand their context before the slack resources are deployed.

Observing the accumulation of slack within the champions prior to the onset of the crises enabled a platform to observe whether dynamic learning capabilities could be detected. In some cases, like human resource slack, the champions recognised that this slack was not a specific resource required to gain a competitive advantage and long-term business performance as this measure remained constant in period two (Lin & Wu, 2014); suggesting a preference of agility and low costs instead of excess staff (Lau, 2011; Lockett & Wild, 2013). It was also noted that the champions commenced the pre-crisis period at higher levels of slack than of that observed during period one, again suggesting that through trial and error and learning from the past, the champions understood what slack was required to be effective within the firms for survival (Lin & Wu, 2014; Manikas & Patel, 2016; Teece et al., 2016) and more specifically to the firm's current context and stages of development (Paeleman &Vanacker, 2015).

6.4. Correlation analysis

Following Gruener and Raastad (2016), correlation analysis was conducted to establish whether any significant relationships existed between the various slacks accumulated and their specific performance measures post the crises. This helped identify the usefulness and effect of slack on firm performance and as a competitive strategy, specifically within an emerging market context.

Overall, the most significant correlation, while weak, existed within the transitional survivors between human resource slack and firm performance. It is observed that within this group, the weakest correlation existed between absorbed slack and performance which was also observed as inversely related to each other. Within the champions of period one, the strongest correlation, which was also negative, was observed between human resource slack and firm performance and this was also corroborated by Dai and Kittilaksanawong (2014). The financial slacks, specifically the absorbed and potential slack indicators, proved to have a higher correlation with firm performance within the champions than in the transitional survivor group; which could have been a result of its rate of accumulation in the pre-crisis periods (Gruener & Raastad, 2016).

Vanacker et al. (2017) and Dai and Kittilaksanawong (2014) corroborated the moderate degree of correlation between potential and absorbed slack and firm performance observed within the champions, as well as the negative correlation between absorbed slack and firm performance (Paeleman & Vanacker, 2015). It could be postulated that during these periods, and within a South African context, there was more of an inverse association between financial slack and firm performance where too much slack could have affected firm performance negatively (Bradley et al., 2011b).

There were very weak to moderate relationships which also proved insignificant, between the different slack measures and their respective performance measures within the different groups (Vanacker et al., 2017), including the low and insignificant correlations observed between the operational slack indicators and their performance measure (Kovach et al., 2015). Unabsorbed financial slack, in a South African context, showed weaker correlations with firm performance than expected and as suggested by Vanacker et al. (2017). Again, this could have been a result of the institutional theory behind a developing market, where firms had low access to resources and less-defined management strategies to accumulate resources (Paeleman & Vanacker, 2015).

Lastly, the champions exhibited dynamic learning capabilities based on the improved correlations between absorbed and potential slack and firm performance, indicating weak and moderate correlations respectively. However, these correlations also proved significant within the context of the research design within the champions in period two. This suggested that financial slack was the preferred type of slack that was expected to have a positive correlation with firm performance; this is justified by Stan et al. (2014) as it was the easiest to effectively deploy and provided the most flexibility (Bradley et al., 2011a). This could again explain why the champions survived over both periods as opposed to the transitional survivors whose relationships focused more so on human resource, capacity and unabsorbed slack.

It was prudent to note the high correlations observed between available slack and unobserved slack, due to these indicators measuring the same type of slack category; as a result, these slack indicators could be used interchangeably (Stan et al., 2014). The available slack indicator was used for the regression analyses.

The correlation analyses also indicated that both performance measures (ROA and gross profit) had strong correlations and could potentially be used as a performance measure for any of the slack indicators (Vanacker et al., 2017). It was also necessary to note that the pre-crisis gross profit performance control measure was significantly correlated with the post-crisis firm performance and was, therefore, a significant measure to control when analysing the effect of slack on performance in the post-crisis periods (Bradley et al., 2011b; Gruener & Raastad, 2016; Vanacker et al., 2017). Of the remaining control variables, firm size was significantly correlated with the gross profit performance measure and was, again, a significant measure to control (Bradley et al., 2011b). While a degree of collinearity existed between the independent variables, the VIF test was well within the threshold of one and ten, in terms of multicollinearity effects (Kovach et al., 2015).

6.5. Regression analysis of post-crisis periods

Penrose's growth theory suggested that the accumulation of slack was an effective strategy to ensure firm growth and performance (Lockett & Wild, 2013). To test hypothesis one, two and three in an emerging market context, and in keeping aligned with Penrose's theory, the effect of slack on firm performance was quantified through multiple linear regression analysis within the transitional survivors of period one and the transitional economy champions of both periods.

6.5.1. Hypothesis 1: A positive relationship exists between human resource slack and firm performance

The null hypothesis stating there was no positive relationship between human resource slack and firm performance was accepted over the alternative hypothesis in both the transitional survivors and champions in period one.

The coefficient within the transitional survivors in period one was observed to be negatively associated with firm performance and insignificant, suggesting an inverse relationship where every additional unit of human resource slack resulted in, on average, a 2.057 unit decrease in the gross performance measure while ensuring the other variables remain constant. The coefficient was also negatively and insignificantly associated with firm performance within the champions in period one, again suggesting an inverse relationship where every additional unit of human resource slack resulted in, on average, 1.601 unit decrease in the gross performance measure.

The null hypothesis was rejected in favour of the alternative hypothesis in terms of significance within the champions in period two. The coefficient, however, was negatively associated with firm performance which suggested an inverse relationship where every additional unit of human resource slack resulted in, on average, a 19.61 unit decrease in the gross performance measure. This negative relationship was confirmed by Lecuona and Reitzig (2014) and Vanacker et al. (2017). It should be noted that the champions within period two had a weak correlation between human resource slack and firm performance and did not accumulate or decumulate slack prior to the global economic recession. While keeping aligned with the dynamic learning capability discussed in section 6.3.1, these champions made better use of the minimal resource slack which existed within the firm and this had a positive and significant effect on firm performance post the volatile period.

It was also necessary to observe that the transitional survivors of period one and the champions within period one focussed on accumulating human resource slack in the pre-crisis periods. Both groups probably accumulated more costs while accumulating human resource slack (Lockett & Wild, 2013). Wang et al. (2016) further confirmed this negative relationship between human resource slack and firm performance; this was dependent on the granularity of the type of slack that was accumulated (general or firm-specific knowledge workers).

Wang et al. (2016) summarised the effect of human resource slack on firm performance as a balancing act; too much slack can negatively affect firm performance in the long run, especially if the staff are orientated around being specific knowledge workers, resulting in deployment difficulty. While the RBV and VRIN theories suggested alignment with specific knowledge workers and the importance of their role (Wang et al. 2016), the contrasting dynamic capabilities and learning theory suggested that this level of human resource slack may have resulted in decreased agility, especially when new strategies were developed around navigating through volatility and overcoming inertia (Achtenhagen et al., 2013).

6.5.2. Hypothesis 2: A positive relationship exists between operational slack indicators and firm performance

The null hypothesis stating that there was no positive or significant relationship between operational slack and firm performance was accepted in favour of the alternative hypothesis.

This applied to the transitional survivors and champions within both the identified transitional periods with regard to the capacity slack and supply chain slack indicators, the latter of which was observed by Manikas and Patel (2016).

The capacity slack coefficient within the transitional survivors of period one was negatively associated with firm performance suggesting an inverse relationship where every additional unit of capacity slack resulted in, on average, a 0.016 unit decrease in the ROA performance measure. The supply chain coefficient was however, positively associated with firm performance, suggesting that for every additional unit of supply chain slack, on average, a 0.007-unit increase would occur on the ROA performance measure. It is however notable that the supply chain slack had a smaller effect on performance when compared to capacity slack.

In period one, the champions indicated positive but insignificant coefficients with the capacity and supply chain slack indicators. This suggested a proportional relationship where every additional unit of capacity slack resulted in, on average, a 0.005 unit increase on firm performance and every additional unit of supply chain slack resulted in, on average, a 0.049 unit increase in the ROA performance measure; supply chain slack was observed to have the larger effect on performance. The capacity slack coefficient changed within the champions in period two, where an inverse relationship was observed instead; every additional unit of capacity slack resulted in, on average, a 0.013 unit decrease in the ROA performance measure. This was opposed to the supply chain coefficient which indicated a positive relationship where an additional unit of supply chain slack resulted in a larger effect of a 0.071 increase in firm performance.

Kovach et al. (2015) identified that capacity slack had a positive and significant effect on firm performance in dynamic environments whereas supply chain slack had an inverse and significant relationship in a similar context. While the results within this research proved insignificant, the relationships theoretically suggested that firms with low capacity slack or young firms may struggle to increase or maintain performance in dynamic and unstable environments as opposed to firms with excess capacity slack (Kovach et al., 2015).

The negative association between capacity slack and firm performance suggested that, when the environment is stable, firms may ineffectively utilise their slack resources and therefore negatively impact performance; capacity slack is more useful in volatile environments (Kovach et al., 2015; Manikas & Patel., 2016).

The negative association between supply chain slack and firm performance, in dynamic environments, suggested that firms with lower supply chain slack had a more positive impact on firm performance; this implied that shorter cash conversion cycles could have assisted in boosting firm performance in volatile periods. These postulations are again dependent on the manager's discretion with regard to how they managed their accounts (Kovach et al., 2015).

Overall, while not significant, the coefficients of supply chain slack seemed to have a larger positive effect on firm performance when compared to capacity slack. This was particularly evident in the champions of period one when compared to the transitional survivors and, again, a noted increase within the champions in period two. This suggested a degree of dynamic learning capabilities and effective use of slack to positively affect firm performance (Lockett & Wild, 2013).

Azadegan et al. (2013) also suggested that operational slack improved a firm's resilience and flexibility. It assisted in overcoming disruptions to the firm's operations and the additional slack allowed for flexibility and maintaining firm performance ahead of adversity; as was observed through the survival of the champions from period one and the increase in operational slack accumulation in period two.

6.5.3. Hypothesis 3: A positive relationship exists between financial slack indicators and firm performance

It was again observed that the null hypothesis was accepted in favour of the alternative hypothesis; financial slack had no significant positive relationship with firm performance post both the crises periods within the transitional survivors or champions.

In period one, the transitional survivors indicated a positive association between firm performance and available slack. An additional unit of available slack resulted in, on average, a 0.015 unit increase in the gross profit performance measure. The same positive relationship was observed within the absorbed slack; an additional unit of absorbed slack resulted in, on average, a 0.053 unit increase in the gross profit performance measure.

The coefficient for potential slack was however, negatively associated with firm performance suggesting an inverse relationship where every additional unit of potential slack resulted in, on average, a 0.056 unit decrease in the gross profit performance measure. This was aligned with the theory in Table 2, where Bourgeois (1981) suggested an inverse relationship between potential slack and performance.

In period one, the champions indicated positive associations between the financial slack indicators and firm performance; an additional unit of available slack resulted in a 0.003 unit increase in firm performance; an additional unit of absorbed slack resulted in a 0.115 unit increase in firm performance and finally, an additional unit of potential slack resulted in a 0.002 unit increase of firm performance. When comparing the transitional survivors and champions within period one, through observation, while not significant, it was found that absorbed slack had the larger positive effect on firm performance within the champions.

Stan et al. (2014) suggested that absorbed slack was not as easily released within the firm due to it being absorbed in other assets and it was postulated that absorbed slack was more orientated around exploitation than exploring for new opportunities. The negative relationships between absorbed slack and performance were indicative of agency theory; managers misused absorbed slack on non-value adding actives (Stan et al., 2014).

The champions in period two had positive relationships between available slack and firm performance. Though insignificant, the coefficients suggested that a unit increase in slack related to, on average, a 0.021 increase in firm performance. A similar positive association was noted between absorbed slack and firm performance, indicating a 0.015 unit increase in performance for every unit increase in absorbed slack. Potential slack and firm performance indicated a negative relationship and though insignificant, proposed that a unit decrease in potential slack resulted in a 0.102 increase in firm performance which is corroborated by Stan et al. (2014). Potential slack was a preferred form of financial slack as it provided the firm with the opportunity to borrow funds externally and attain a higher degree of flexibility when compared other slack forms. Potential slack was postulated to provide more agility and flexibility for firms (Stan et al., 2014), which is reflected within the regression results; where potential slack has a higher coefficient when compared to the other indicators, especially within the champions in period two.

6.5.4. Summary

Vanacker et al. (2017) indicated that while slack resources and its effect on firm performance was popularly investigated within developed economies (Gaur et al., 2014), there has been disparities within the concluded findings. These disparities are observed within this research design which focussed more on a South African emerging market context.

In summary, while only human resource slack within the champions in period two proved to be significant, the theory behind the coefficient association proposed that resource slack does have value in dynamic or volatile periods (Gruener & Raastad, 2016). As observed within the accumulation and correlation analysis, financial slack provided the most flexibility and had a stronger association with firm performance over the two periods (Gruener & Raastad, 2016) and this was also evident through the champions dynamic learning capabilities, observed in effect of the coefficient.

Within this context, while the regression models themselves were significant (aside from the operational slack in model three), the individual regressors or slack variables were not individually significant enough to have a robust effect on firm performance. It could be concluded that, within a South African emerging market context, resource slack had a better relationship with and effect on firm performance when a medley of slacks was accumulated and deployed (Wilden et al., 2013).

6.6.   Parabolic results of post-crisis periods

Gruener and Raastad (2016) and Haans et al. (2016) suggested that slack and firm performance had a negative parabolic relationship. Hypothesis four, five and six were constructed to test this theory within the transitional survivors and champions within period one and the champions within period two.

6.6.1. Hypothesis 4: A negative parabolic relationship exists between human resource slack and firm performance

The squared terms observed in Table 15 were insignificant and positive within the transitional survivors and champions in period one. This indicated that no significant inverse parabolic curve existed between human resource slack and firm performance. The champions in period two indicated a negative squared term which would have been indicative of a negative parabolic curve, however the term was insignificant.

This suggested that a quadratic function was not a good fit for the data and that the variables were linearly associated, as suggested by the linear correlations in Tables 10, 11 and 12 (Azadegan et al., 2013; Haans et al., 2016).

Theory, however, suggested that slack and performance had a negative parabolic relationship (Stan et al., 2014), suggesting that the squared value was strongly negative and significant (Haans et al., 2016). Vanacker et al. (2017) suggested otherwise, indicating that human resource slack and firm performance had a positive and significant squared term indicating that decreasing human resource slack had a negative effect on firm performance up till the point of inflection; these findings suggested a positive parabolic curve existed between the variables. A negative and significant squared term would have suggested that increasing levels of human resource slack would have a positive effect on firm performance, up till a point, thereafter, too much slack would negatively affect performance (Haans et al., 2016). Again, it was emphasised that this curve, like the utilisation of slack, is dependent on the manager's discretion (Lockett & Wild, 2013) and the type of workers within the firm (Lecuona & Reitzig, 2014).

6.6.2. Hypothesis 5: A negative parabolic relationship exists between operational slack indicators and firm performance

There were no significant negative squared terms in the transitional survivors or champions in period one on both measures of capacity slack and supply chain slack. Again, a similar insignificant trend was observed within the champions in period two. These findings were aligned to Azadegan et al. (2013) and Manikas and Patel (2016) where no significant quadratic form was concluded between operational slack and firm performance. This is indicative of operational slack have a linear relationship with firm performance following the correlation analysis in Tables 10, 11 and 12.

6.6.3. Hypothesis 6: A negative parabolic relationship exists between financial slack indicators and firm performance

There were no significant negative squared coefficients observed in the polynomial regression analysis indicating that a quadratic function was not fit for the data within this research context. Again, this suggested that a linear model was more appropriate as per the correlation analyses in Tables 10, 11, 12.

Theory observed from developed economies however, suggested that there was a negative parabolic shaped relationship, between financial slack firm performance (Stan et al., 2014).

This negative parabolic curve was more observable in absorbed slack which tended to have significant negative squared terms suggesting that too much slack could diminish performance (Stan et al., 2014; Vanacker et al., 2017). Gruener and Raastad (2016) also observed a positive parabolic shaped relationship between potential slack and performance where potential slack had a positive squared term and negative linear term, giving rise to a positive parabolic shape.

6.6.4. Summary

Vanacker et al. (2013) suggested that the effect of slack on firm performance was dependent on how that slack was utilised, specifically relating to slack use according to management's discretion. Too much slack could lead to complacency and could, in theory, result in a negative parabolic relationship, according to agency theory (Kim & Bettis, 2014). Slack scarcity could have the opposite effect, according to entrepreneurial behaviours, and force manager's to be innovative in their approach to survival and long-term firm performance (Bradley et al., 2011b). Alternatively, that lack of slack could discourage managers from being innovative, diversifying their portfolios or making investments that could be considered risky due to the lack of cushioning or absorptive factors that slack provided (Kim & Bettis, 2014).

This ultimately suggests that slack was expected to have a dual effect on firm performance and this in turn determined whether slack has a negative or positive parabolic shaped relationship with performance. For these reasons, slack, as a competitive strategy, needs to be kept at an optimal level otherwise performance could be diminished (Haans et al., 2016; Pierce & Aguinis, 2013) and this could lead to a firm losing its competitive advantage and opportunity to encourage long-term growth and performance (Vanacker et al., 2013).

However, it should be noted that that Pierce and Aguinis (2013) had suggested that the testing of the curvilinear theory did not always achieve significant results due to a poor and diminishing statistical influence as was seen within the context of this research design. As a result, it could be concluded that there was no significant parabolic relationship between slack and performance within the transitional survivors or champions in both periods and in addition, no robust inflection point could be identified.

Su et al. (2009) corroborated this by explaining that firms in volatile or transitional economies were expected to rapidly adapt to the environment, resulting in slack that may not be easily accumulated or deployed. Therefore, the proposed curvilinear relationship may not easily be investigated in emerging economies as compared to more developed economies.

Chapter 7: Conclusion

7.1.   Introduction

Chapter 7 summarises the principal findings and theoretical contributions behind resource slack as a competitive strategy in achieving long-term business performance within an emerging market context, identifying whether resource slack provided the agility required in navigating through economic volatility. The principal findings are discussed in alignment with the theoretical lens established in Chapter 2, the main hypotheses formulated in Chapter 3 and, finally, the results and main discussions presented in Chapter 5 and 6. The chapter concludes with management implications, recommendations and limitations of the research and, finally, suggestions for future research are posed.

7.2.   Principal findings

Several theoretical contributions were established within the context of this research; the use of resource slack used in conjunction with learning and dynamic capabilities and Penrose's growth and behavioural theory, to encourage resilience and flexibility when operating in volatile economic periods (Gruener & Raastad, 2016; Stan et al., 2014; Sull, 2009; Teece, 2017; Vanacker et al., 2017). While being popular theories to study in developed markets to assist firms in overcoming economic volatility (Gruener & Raastad, 2016), the research demonstrates the contribution of these theories in an emerging market context (Stan et al., 2014).

It is noted that high levels of resource slack were not actively accumulated within the early stages approaching the transition from Apartheid, indicating that that these capabilities were not yet developed within the champions or transitional survivors, while undergoing this first major dynamic period. As discussed by Azadegan et al. (2013), firms which were exposed to a transitional environment early on in their existence may not have created the capacities required to accumulate and manage the use or deployment of slack effectively. Vanacker et al. (2017) and Wang et al. (2016) suggested that within emerging economies, the relationship and effect of slack on firm performance was not as robust as observed within developed economies. Vanacker et al. (2017) mentioned the fact that institutions play a large part in the facilitation of resource slack and firm performance; this institutional theory is particularly emphasised in more underdeveloped institutions like South Africa, where these frameworks are still being developed.

It is demonstrated that the survival champions encompassed a degree of dynamic learning capabilities; these champions used period one to learn, evolve and adapt their slack resource base to the next environmental context, in this case the global financial transition (Pierce & Aguinis, 2013). This could be seen through the change in accumulation and decumulation of slack during the pre-crisis periods. These champions were aware of past slack effects on performance and modified their resource base accordingly when approaching period two (Pierce & Aguinis, 2013). This is also observed by the stronger and improved correlation between the slack types, specifically within financial slack indicators and firm performance. Parida and Örtqvist (2015) further validated the use and deployment of slack (more-so, financial slack as observed) to create agility within a firm, allowing the firm to overcome environmental volatility, as was seen within the champions group. It can be postulated that the transitional survivors lacked the appropriate dynamic capabilities which could have resulted in the ineffective use of their slack resources. They did not encourage a level of environmental sensing or learning and thus lacked the competitive management strategy necessary to survive beyond period one (Liu et al., 2014; Teece et al., 2016).

There was also a level of granularity involved in accumulating and deploying slack resources; specifically: the accumulation and release of general knowledge works versus specific knowledge workers (Lecuona & Reitzig, 2014), longer or shorter cash conversion cycles or increasing fixed assets (Manikas & Patel., 2016), and using free cash, absorbed finances or gearing (Stan et al., 2014) to achieve a desired level of slack and thus long-term performance. The findings suggested that while human resource slack was the least accumulated slack type, financial slack in the form of the unabsorbed slack, which has a higher degree of deployment, and potential slack, providing financial slack through gearing, were featured as the more prominent types of slack to be associated with performance (Sui & Baum, 2014). These slack types assisted the champions to adapt to the transitional periods and encouraged exploration and innovation in the champions (Liu et al., 2014).

The comparison between the transitional survivors and champions within period one and comparison of the champions in period two provided a platform to further understand dynamic and learning capabilities, with regard to resource slack within a South African context (Hitt et al., 2011).

A firm's dynamic capabilities is a quintessential underlying property of the firm; this allows firms to sense, learn, evolve and adapt. This is facilitated by either exploiting the current resource base or accumulating resources to explore new opportunities and evolve to survive and enhance long-term performance (Sull, 2009). This was observed in the champions who used resource slack as a facilitator for aspects of dynamic capabilities. These champions assessed their current context, learned from the past (period one) and evolved and adapted their resource slack base to overcome the second volatile period. This, in conjunction with behavioural theory, is what allowed the transitional economy champions to survive and maintain their long-term performance (Stan et al., 2014; Teece, 2017).

In summary, the findings in this research indicated disparities with what was expected and previous studies. Slack was not actively accumulated or utilised to significantly effect firm performance ahead of volatile periods, as was demonstrated in developed economies. However, within a South African context, it was observed that slack, through dynamic learning capabilities, played a more significant role within the champions in period two. It was observed that an amalgamation of various slack types had a predictive and positive effect on firm performance post the volatile periods. In keeping aligned with Penrose's growth theory, slack was noted to provide the champions with resilience and flexibility as described by Sull (2009) and these characteristics were used in conjunction with an entrepreneurial outlook and the firm's dynamic learning capabilities (Stan et al., 2014). These observations conclude that resource slack could be considered a competitive strategy which ensured the long-term performance of the champions over the 23-year period.

7.3.   Implications for management

Resource slack and dynamic capabilities may have contributed to the 23-year survival within the transitional economy champions; however, when compared to the fluctuation in slack accumulation and its relationship on firm performance, it is essential to note that a driving factor behind these observations was behavioural theory (Vanacker et al., 2013).

The champions may have had managers who were more inclined to the behavioural theory and entrepreneurial approach; using the combination of resource slack to build resilience and to explore new avenues.

This allowed the champions to evolve within a rapidly changing environment; to align themselves better with their consumer's shifting demands and staying ahead of competitors, or specifically, the transitional survivors (Bradley et al., 2011b; Sull, 2009;). These managers had a more long-term outlook with regards to the accumulation and use of resource slack and hence created a competitive advantage for themselves (Vanacker et al., 2013).

As suggested by Lecuona and Reitzig (2014), like the champions, managers need to focus on the context of their current business and environment to ascertain which types of slack would be necessary to achieve a competitive advantage and long-term performance.

Managers could gain to learn from the transitional survivors whose outlook may have been contradictory to that of the champions; their focus could have been on short-term or quick gains (Goerzen & Beamish, 2007). In addition, the transitional survivors could have also had a management focus which orientated around agency theory; inappropriately accumulating and using slack resource for personal gain or on value-destroying activities (Kim & Bettis, 2014; Pierce & Aguinis, 2013; Stan et al., 2014).

While the negative parabolic relationship between slack and firm performance was not confirmed within this paper, prior research strongly suggests that the relationship does exist (Gruener & Raastad, 2016; Haans et al., 2016; Pierce & Aguinis, 2013; Stan et al., 2014). In keeping aligned with behavioural theory of the firm, managers need to appreciate that resource slack has a two-fold effect on firm performance. The required or necessary resource orchestration is highly dependent on the firm's internal and external context in combination with management's discretionary outlook (Haans et al., 2016; Pierce & Aguinis, 2013; Vanacker et al., 2017).

Managers also need to take cognisance of the fact that they need to expand and evolve their capabilities. Today's global environment is rapidly shifting towards a technological and digital era; forcing managers to revaluate their current resources and future strategies to maintain their front-runner position and sustain their performance (Teece, 2017). Manager's need to focus on gaining new knowledge by looking to developed economies to better understand the importance of slack as a competitive strategy and enabler of long-term firm performance (Sirmon et al., 2011).

This will allow managers to remain in a continuous dynamic learning mode, building their capabilities to be flexible and adaptive in the current volatile economy, to overcome inertia and quickly adopt new strategies to maintain a competitive advantage (Achtenhagen et al., 2013; Talay & Townsend, 2015).

7.4. Limitations of the research

The most challenging aspect of this research was mitigating undisclosed financial statements as well as the missing variables observed in the disclosed financial statements; this could have resulted in a statistical-power decrease within the sample affecting the models (Pierce & Aguinis, 2013). This in turn may have potentially negated the opportunity to robustly test the parabolic theories behind slack and firm performance.

While this study was orientated around a comparative nature between firms and their use of slack as a competitive strategy, the selecting of industrial firms which operated only in period one and period two could have reduced the range in the sample again affecting the statistical models and analysis (Cader & Leatherman, 2011).

Though financial statements were obtained from reputable sources, the statements were not designed in a way to specifically cater for this research project, resulting in a degree of limitation with regard to the secondary data obtained (Azadegan et al., 2013). To overcome the missing data, best-fit imputations were conducted. While best-fit analysis was used, these imputations and incorrect variables observed within the statements could have affected the statistical significance behind the models and introduced other extreme values (Lin & Mehlum, 2010). Additionally, where imputations could not be confidently made, the firms and variables were disregarded, again, affecting the range of the research design (Pierce & Aguinis, 2013).

7.5. Suggestions for future research

Human resource slack was measured as a ratio between the number of employees and firm sales; this ratio did not account for the level of granularity which exists within human resource slack. As discussed to in this research, there are several granular human resource slack descriptions specifically relating to their skill level (Dai & Kittilaksanawong, 2014).

As a result, a suggested research opportunity exists in identifying the type of human capital resources which firms accumulate or release to overcome volatile periods; tacit or firm-specific human capital or general human capital, as identified by Lecuona and Reitzig (2014). A primary and mixed methodology research is suggested as this level of granularity cannot be inferred from secondary data or public financial statements.

In keeping aligned with the context of this research, another suggestion is to continue investigating the transitional economy champions from period one to date; this creates a larger data set over a longer period of time. It identifies whether these champions are still surviving today and to better analyse the effect of resource slack on firm performance using a more robust research period.

In conjunction, to effectively test the inverse parabolic relationship between resource slack and firm performance, this larger data set could assist with achieving a statistically significant model and accurately identify whether South African firms have a critical point before slack starts to diminish firm performance or whether this observation is restricted to developed markets.

A third avenue for future research would be to approach this thesis through the collection of primary data by interviewing senior management of JSE listed firms. Senior management would be an appropriate sample due to their strategic decision-making and roll out of strategies. The interview is suggested to be structured around whether the identified firms use dynamic capabilities in the form of resource allocation and which types of resources are emphasised as a competitive management strategy to maintain long-term performance.

A final suggested research opportunity lies in line with Liu et al. (2014) who indicated that a more significant understanding was required with regards to the relationship and effect of slack on product innovation within firms. While it is postulated that slack, through behaviour theory and an entrepreneurial outlook, provides a platform for exploration and innovation, it would be relevant to investigate the direct link between which types of slack encourage innovation and if this does have a direct effect on firm performance.

References

Achtenhagen, L., Melin, L., & Naldi, L. (2013). Dynamics of business models–
strategizing, critical capabilities and activities for sustained value creation. *Long Range Planning*, *46*(6), 427–442.

Akgün, A. E., & Keskin, H. (2014). Organisational resilience capacity and firm product innovativeness and performance. *International Journal of Production Research*, *52*(23), 6918–6937.

Allianz. (2016). Allianz Risk Barometer: Top business risks 2016. Retrieved from http://www.agcs.allianz.com/global-offices/south-africa/news-press-africa/allianz-risk-barometer-2016/

Ambrosini, V., Bowman, C., & Collier, N. (2009). Dynamic capabilities: An exploration of how firms renew their resource base. *British Journal of Management*, *20*(s1), 9–24.

Azadegan, A., Patel, P. C., & Parida, V. (2013). Operational slack and venture survival. *Production and Operations Management*, *22*(1), 1–18.

Bahrami, H., & Evans, S. (2011). Super-flexibility for real-time adaptation: Perspectives from Silicon Valley. *California Management Review*, *53*(3), 21–39.

Banalieva, E. R. (2014). Embracing the second best? Synchronization of reform speeds, excess high discretion slack, and performance of transition economy firms. *Global Strategy Journal*, *4*(2), 104–126.

Belderbos, R., Tong, T. W., & Wu, S. (2014). Multinationality and downside risk: The roles of option portfolio and organization. *Strategic Management Journal*, *35*(1), 88–106.

Bettis, R., Gambardella, A., Helfat, C., & Mitchell, W. (2014). Quantitative empirical analysis in strategic management. *Strategic Management Journal*, *35*(7), 949–953.

Bluhm, D. J., Harman, W., Lee, T. W., & Mitchell, T. R. (2011). Qualitative research in management: A decade of progress. *Journal of Management Studies*, *48*(8), 1866–1891.

Bourgeois, L. J. (1981). On the measurement of organizational slack. *Academy of Management Review, 6*(1), 29–39.

Bourgeois, L. J., & Singh, J. V. (1983). Organizational slack and political behaviour among top management teams. *Academy of Management Proceedings*, 43–47.

Bradley, S. W., Shepherd, D. A., & Wiklund, J. (July 1, 2011a). The Importance of slack for new organizations facing 'tough' environments. *Journal of Management Studies*, *48*(5), 1071–1097.

Bradley, S. W., Wiklund, J., & Shepherd, D. A. (2011b). Swinging a double-edged sword: The effect of slack on entrepreneurial management and growth. *Journal of Business Venturing*, *26*(5), 537–554.

Bray, D. A. (2017). Three meaningful strategies for managing rapid change. Retrieved from http://sloanreview.mit.edu/article/three-meaningful-strategies-for-managing-rapid-change/

Bryman, A., & Bell, E. (2015). *Business research methods.* Oxford University Press.

Bryman, A., Bell, E., Mills, A. J., & Yue, A. R. (2011). *Business research methods* (first Canadian edition). Oxford University Press. Retrieved from https://www.researchgate.net/publication/259290714_16_Bryman_A_Bell_E_Mills_A_J_and_Yue_A_R2011_Business_Research_Methods_First_Canadian_Edition_Toronto_Oxford_University_Press

Bukhari, J. (2017). Amazon is worth more than Walmart, Costco, and Target combined. Retrieved from http://fortune.com/2017/04/05/amazon-walmart-costco-target-market-cap/

Cader, H., & Leatherman, J. (2011). Small business survival and sample selection bias. *Small Business Economics*, *37*(2), 155–165.

Chan, D. (2013). The challenges facing management in a rapidly changing business environment. Retrieved from https://www.cass.city.ac.uk/faculties-and-research/research/cass-knowledge/2013/november/the-challenges-facing-management-in-a-rapidly-changing-business-environment

Chipeta, C., & Mbululu, D. (2013). Firm heterogeneity, macroeconomic conditions and capital structure adjustment speeds: Evidence from the JSE. *Investment Analysts Journal*, *42*(77), 69–80.

Coen, C. A., & Maritan, C. A. (2011). Investing in capabilities: The dynamics of resource allocation. *Organization Science*, *22*(1), 99–117.

Collis, J., & Hussey, R. (2013). *Business research: A practical guide for undergraduate and postgraduate students.* Palgrave Macmillan.

Dai, W., & Kittilaksanawong, W. (2014). How are different slack resources translated into firm growth? Evidence from China. *International Business Research*, *7*(2), 1.

de Jong, A., Verbeek, M., & Verwijmeren, P. (2012). Does financial flexibility reduce investment distortions? *Journal of Financial Research*, *35*(2), 243–259.

Dediu, H. (2013). Seeing what's next. Retrieved from http://www.asymco.com/2013/11/18/seeing-whats-next-2/

Deloitte. (2017). Managing volatility in an uncertain economic environment. Retrieved from https://www2.deloitte.com/za/en/pages/deloitte-africa/articles/managing-volatility-insights-south-africa.html

Derfus, P. J., Maggitti, P. G., Grimm, C. M., & Smith, K. G. (2008). The Red Queen effect: Competitive actions and firm performance. *Academy of Management Journal*, *51*(1), 61–80.

Dixon, S., Meyer, K., & Day, M. (2014). Building dynamic capabilities of adaptation and innovation: A study of micro-foundations in a transition economy. *Long Range Planning*, *47*(4), 186–205.

Drnevich, P. L., & Kriauciunas, A. P. (2011). Clarifying the conditions and limits of the contributions of ordinary and dynamic capabilities to relative firm performance. *Strategic Management Journal*, *32*(3), 254–279.

Dyer, J., Furr, N., & Lefrandt, C. (2014). The industries plagued by the most uncertainty. *Harvard Business Review, Digital Article*, *11*.

Eisenhardt, K. M., & Martin, J. A. (2000). Dynamic capabilities: what are they? *Strategic Management Journal*, 1105–1121.

Fama, E. F., & French, K. R. (1992). The cross-section of expected stock returns. *The Journal of Finance*, *47*(2), 427–465.

Fernhaber, S. A., & Patel, P. C. (2012). How do young firms manage product portfolio complexity? The role of absorptive capacity and ambidexterity. *Strategic Management Journal*, *33*(13), 1516–1539.

Frees, E. W. (2003). *Longitudinal and panel data: analysis and applications for the social sciences* (Vol. 101). Cambridge university press.

Gaur, A. S., Kumar, V., & Singh, D. (2014). Institutions, resources, and internationalization of emerging economy firms. *Journal of World Business*, *49*(1), 12–20.

Goerzen, A., & Beamish, P. W. (2007). The Penrose effect: "Excess" expatriates in multinational enterprises. *Management International Review (MIR)*, *47*(2), 221–239.

Grewal, R., Cote, J. A., & Baumgartner, H. (2004). Multicollinearity and measurement error in structural equation models: Implications for theory testing. *Marketing Science*, *23*(4), 519–529.

Gruener, A., & Raastad, I. (2016). Financial slack and firm performance during an economic downturn. In *The International Academic Forum*. Retrieved from https://think.iafor.org/financial-slack-firm-performance-economic-downturn/

Haans, R. F., Pieters, C., & He, Z.-L. (2016). Thinking about U: Theorizing and testing U-and inverted U-shaped relationships in strategy research. *Strategic Management Journal*, *37*(7), 1177–1195.

Harrison, R. L. (2013). Using mixed methods designs in the Journal of Business Research, 1990–2010. *Journal of Business Research*, *66*(11), 2153–2162.

Hendricks, K. B., Singhal, V. R., & Zhang, R. (2009). The effect of operational slack, diversification, and vertical relatedness on the stock market reaction to supply chain disruptions. *Journal of Operations Management*, *27*(3), 233–246.

Hitt, M. A., Ireland, R. D., Sirmon, D. G., & Trahms, C. A. (2011). Strategic entrepreneurship: creating value for individuals, organizations, and society. *The Academy of Management Perspectives*, *25*(2), 57–75.

Hsiao, C. (2014). *Analysis of panel data*. Cambridge university press.

Huang, K.-F., Dyerson, R., Wu, L.-Y., & Harindranath, G. (2015). From temporary competitive advantage to sustainable competitive advantage. *British Journal of Management*, *26*(4), 617–636.

INET BFA. (2017). South Africa. Retrieved from http://www.inetbfa.com/za

JSE. (n.d.). Johannesburg Stock Exchange. Retrieved from https://www.jse.co.za/services/market-data/indices/ftse-jse-africa-index-series/sa-sector

Kim, C., & Bettis, R. A. (2014). Cash is surprisingly valuable as a strategic asset. *Strategic Management Journal*, *35*(13), 2053–2063.

Kovach, J. J., Hora, M., Manikas, A., & Patel, P. C. (2015). Firm performance in dynamic environments: The role of operational slack and operational scope. *Journal of Operations Management*, *37*, 1–12.

Lau, C-M. (2012). Team and organizational resources, strategic orientations, and firm performance in a transitional economy. *Journal of Business Research*, *62*(12), 1344–1352.

Lampel, J., Bhalla, A., & Jha, P. P. (2014). Does governance confer organisational resilience? Evidence from UK employee owned businesses. *European Management Journal*, *32*(1), 66–72.

Lecuona, J. R., & Reitzig, M. (2014). Knowledge worth having in 'excess': The value of tacit and firm-specific human resource slack. *Strategic Management Journal*, *35*(7), 954–973.

Li, D., & Liu, J. (2014). Dynamic capabilities, environmental dynamism, and competitive advantage: Evidence from China. *Journal of Business Research*, *67*(1), 2793–2799.

Liden, R. C. (2012). Leadership research in Asia: A brief assessment and suggestions for the future. *Asia Pacific Journal of Management*, *29*(2), 205–212.

Lin, Y., & Wu, L.-Y. (2014). Exploring the role of dynamic capabilities in firm performance under the resource-based view framework. *Journal of Business Research*, *67*(3), 407–413.

Lind, J. T., & Mehlum, H. (2010). With or without U? the Appropriate test for a U-Shaped Relationship. *Oxford Bulletin of Economics and Statistics*, *72*(1), 109–118.

Liu, H., Ding, X., Guo, H., & Luo, J. (2014). How does slack affect product innovation in high-tech Chinese firms: The contingent value of entrepreneurial orientation. *Asia Pacific Journal of Management*, *31*(1), 47–68.

Liu, Y. (2013). Sustainable competitive advantage in turbulent business environments. *International Journal of Production Research*, *51*(10), 2821–2841.

Lockett, A., & Wild, A. (2013). A Penrosean theory of acquisitive growth. *Business History*, *55*(5), 790–817.

Lohr, S. L. (2010). *Sampling: Design and Analysis* (2nd ed.). Cengage Learning.

Maddala, G. S. (1992). *Introduction to Econometrics. (1992)*. Macmillan.

Makkonen, H., Pohjola, M., Olkkonen, R., & Koponen, A. (2014). Dynamic capabilities and firm performance in a financial crisis. *Journal of Business Research*, *67*(1), 2707–2719.

Manikas, A. S., & Patel, P. C. (2016). Managing sales surprise: The role of operational slack and volume flexibility. *International Journal of Production Economics*, *179*, 101–116.

Matai, D. K. (2011, March 30). What is the key to survival in a constantly changing environment? Retrieved from http://www.businessinsider.com/what-is-the-key-to-survival-in-a-constantly-changing-environment-2011-3

Modi, S. B., & Mishra, S. (2011). What drives financial performance–resource efficiency or resource slack?: Evidence from U.S. based manufacturing firms from 1991 to 2006. *Journal of Operations Management*, *29*(3), 254–273.

Molina-Azorin, J. F. (2012). Mixed methods research in strategic management: Impact and applications. *Organizational Research Methods*, *15*(1), 33–56.

Osiris. (2017). Osiris - information on listed companies global. Retrieved from https://www.bvdinfo.com/en-us/our-products/company-information/international-products/osiris

Paeleman, I., & Vanacker, T. (2015). Less is More, or Not? On the interplay between bundles of slack resources, firm performance and firm survival. *Journal of Management Studies*, *52*(6), 819–848.

Pal, R., Torstensson, H. akan, & Mattila, H. (2014). Antecedents of organizational resilience in economic crises—an empirical study of Swedish textile and clothing SMEs. *International Journal of Production Economics*, *147*, 410–428.

Parida, V., & Örtqvist, D. (2015). Interactive effects of network capability, ICT capability, and financial slack on technology-based small firm innovation performance. *Journal of Small Business Management*, *53*, 278–298.

Pierce, J. R., & Aguinis, H. (2013). The too-much-of-a-good-thing effect in management. *Journal of Management*, *39*(2), 313–338.

Rahaman, M. M. (2011). Access to financing and firm growth. *Journal of Banking & Finance*, *35*(3), 709–723.

Razali, N. M., & Wah, Y. B. (2011). Power comparisons of shapiro-wilk, kolmogorov-smirnov, lilliefors and anderson-darling tests. *Journal of Statistical Modeling and Analytics*, *2*(1), 21–33.

Reeves, M., & Deimler, M. (2011). Adaptability: The new competitive advantage. *Harvard Business Review*. Retrieved from https://hbr.org/2011/07/adaptability-the-new-competitive-advantage

Reeves, M., Love, C., & Tillmanns, P. (2012). Your strategy needs a strategy. *Harvard Business Review*, *90*(9), 76–83.

Salge, T. O., & Vera, A. (2013). Small steps that matter: Incremental learning, slack resources and organizational performance. *British Journal of Management*, *24*(2), 156–173.

Santos, G. (2017). Emerging markets are on the rise. *Business Insider*. Retrieved from http://www.businessinsider.com/emerging-markets-are-on-the-rise-2017-6

Saunders, M. N., & Lewis, P. (2012). *Doing research in business & management: An essential guide to planning your project*. Pearson. Retrieved from http://epubs.surrey.ac.uk/id/eprint/817620

Schreyögg, G., & Sydow, J. (2011). Organizational path dependence: A process view. *Organization Studies*, *32*(3), 321–335.

Shamsie, J., Martin, X., & Miller, D. (2009). In with the old, in with the new: Capabilities, strategies, and performance among the Hollywood studios. *Strategic Management Journal*, *30*(13), 1440–1452.

ShareData. (2017). ShareData Online - South African share prices, JSE listed company information. Retrieved from http://www.sharedata.co.za/

Shepherd, N. G., & Rudd, J. M. (2014). The influence of context on the strategic decision-making process: A review of the literature. *International Journal of Management Reviews*, *16*(3), 340–364.

Singh, J. V. (1986). Performance, slack, and risk taking in organizational decision making. *Academy of Management Journal*, *29*(3), 562–585.

Sirmon, D. G., Hitt, M. A., Ireland, R. D., & Gilbert, B. A. (2011). Resource orchestration to create competitive advantage: Breadth, depth, and life cycle effects. *Journal of Management*, *37*(5), 1390–1412.

Stan, C. V., Peng, M. W., & Bruton, G. D. (2014). Slack and the performance of state-owned enterprises. *Asia Pacific Journal of Management*, *31*(2), 473–495.

Su, Z., Xie, E., & Li, Y. (2009). Organizational slack and firm performance during institutional transitions. *Asia Pacific Journal of Management*, *26*(1), 75–91.

Sui, S., & Baum, M. (2014). Internationalization strategy, firm resources and the survival of SMEs in the export market. *Journal of International Business Studies*, *45*(7), 821–841.

Sull, D. (2009, February 1). How to thrive in turbulent markets. Retrieved from https://hbr.org/2009/02/how-to-thrive-in-turbulent-markets

Sull, D. (2010). Competing through organizational agility. *McKinsey Quarterly*, *1*(1–9).

Sullivan, B. N., & Tang, Y. (2012). Small-world networks, absorptive capacity and firm performance: evidence from the US venture capital industry. *International Journal of Strategic Change Management*, *4*(2), 149–175.

Talay, M. B., Calantone, R. J., & Voorhees, C. M. (2014). Coevolutionary dynamics of automotive competition: Product innovation, change, and marketplace survival. *Journal of Product Innovation Management*, *31*(1), 61–78.

Talay, M. B., & Townsend, J. D. (2015). Do or die: competitive effects and Red Queen dynamics in the product survival race. *Industrial & Corporate Change*, *24*(3), 721–738.

Tan, J., & Peng, M. W. (2003). Organizational slack and firm performance during economic transitions: Two studies from an emerging economy. *Strategic Management Journal*, *24*(13), 1249–1263.

Teece, D. J. (2007). Explicating dynamic capabilities: the nature and microfoundations of (sustainable) enterprise performance. *Strategic Management Journal*, *28*(13), 1319–1350.

Teece, D. J. (2012). Dynamic capabilities: Routines versus entrepreneurial action. *Journal of Management Studies*, *49*(8), 1395–1401.

Teece, D. J. (2017). Business models and dynamic capabilities. *Long Range Planning*.

Teece, D. J., Peteraf, M., & Leih, S. (2016). Dynamic capabilities and organizational agility. *California Management Review*, *58*(4), 13–35.

The Economist. (2014). Everybody wants to rule the world. Retrieved from https://www.economist.com/news/briefing/21635077-online-businesses-can-grow-very-large-very-fastit-what-makes-them-exciting-does-it-also-make

Thode, H. C. (2002). *Testing for normality*. CRC Press.

Trading economics. (2017). South Africa Unemployment Rate. Retrieved from https://tradingeconomics.com/south-africa/unemployment-rate

Van Schoor, A. (2017). *Transitional economy survival champions : the experience of South African firms* (Mini Dissertation). University of Pretoria. Retrieved from http://repository.up.ac.za/handle/2263/59793

Vanacker, T., Collewaert, V., & Paeleman, I. (2013). The relationship between slack resources and the performance of entrepreneurial firms: the role of venture capital and angel investors. *Journal of Management Studies*, *50*(6), 1070–1096.

Vanacker, T., Collewaert, V., & Zahra, S. A. (2017). Slack resources, firm performance, and the institutional context: Evidence from privately held European firms. *Strategic Management Journal*, *38*(6), 1305–1326.

Wang, H., Choi, J., Wan, G., & Dong, J. Q. (2016). Slack resources and the rent-generating potential of firm-specific knowledge. *Journal of Management*, *42*(2), 500–523.

Weber, Y., & Tarba, S. Y. (2014). Strategic agility: A state of the art. *California Management Review*, *56*(3), 5–12.

Wegner, T. (2015). *Applied Business Statistics methods and excel-based applications* (4th ed.). Claremont: Juta and Company (Pty) Ltd.

Wiengarten, F., Fan, D., Lo, C. K. Y., & Pagell, M. (2017). The differing impacts of operational and financial slack on occupational safety in varying market conditions. *Journal of Operations Management*, *52*, 30–45.

Wiere, M. (2013). 5 Strategies organizations can leverage to survive and thrive in today's dynamic business environment. Retrieved from https://mariewiere.com/2013/06/23/5-strategies-organizations-can-leverage-to-survive-and-thrive-in-todays-dynamic-business-environment/

Wilcox, D., & Gebbie, T. (2007). An analysis of cross-correlations in an emerging market. *Physica A: Statistical Mechanics and Its Applications*, *375*(2), 584–598.

Wilcox, R. R. (2016). *Understanding and Applying Basic Statistical Methods Using R*. John Wiley & Sons.

Wilden, R., Gudergan, S. P., Nielsen, B. B., & Lings, I. (2013). Dynamic capabilities and performance: strategy, structure and environment. *Long Range Planning*, *46*(1), 72–96.

Xu, D., & Meyer, K. E. (2013). Linking theory and context: "Strategy research in emerging economies" after Wright et al.(2005). *Journal of Management Studies*, *50*(7), 1322–1346.

Young, M. N., Tsai, T., Wang, X., Liu, S., & Ahlstrom, D. (2014). Strategy in emerging economies and the theory of the firm. *Asia Pacific Journal of Management*, *31*(2), 331–354.

Zikmund, W. G., Babin, B. J., Carr, J. C., & Griffin, M. (2013). *Business research methods*. Cengage Learning.

Zona, F. (2012). Corporate investing as a response to economic downturn: prospect theory, the behavioural agency model and the role of financial slack. *British Journal of Management*, *23*, S42–S57.

Appendix 1: Industrial firms (Van Schoor, 2017)

Code	Name	Code	Name	Code	Name	Code	Name	Code	Name
AAL	Alpha Ltd Ord	CLM	Carlton Paper Corp Ltd	FIN	Fintech Ltd	MXM	Maxmech Mechanical Seals	SER	Seardel Inv Corp Ltd
ABA	Abacus Ind Hldgs Ltd Ord	CLS	Clicks Group Ltd	FNR	Fenner Group S A Ltd	MZG	Metje & Ziegler Ltd Ord	SFC	S A Freight Corporation
ABI	Amalgamated Beverage Ind	CLY	Clyde Industrial Corp	FSC	Fasic Ltd	NCS	Nictus Beperk	SFR	Safmarine & Rennies Ord
ABS	Abs Holdings Ltd	CMH	Combined Motor Hldgs Ltd	GDL	Gundle Ltd	NEI	Northern Eng Ind Afr Ltd	SFT	Safety Technologies Ltd
ABY	Abbey Holdings Ltd Ord	CMI	Consol Metallurgical Ind	GHL	Grant Andrews Hldgs Ltd	NIN	Ninian & Lester Hldgs	SFW	Stellenbsch Farmers Wine
ACA	African Cables Ltd	CMT	Cementation Co Afr Ltd	GND	Grindrod Ltd	NMS	Namibian Sea Products Ld	SHL	Shield Trading Corp Ltd
ACL	Arcelormittal Sa Limited	CNC	Concor Ltd	GOC	General Optical Ltd Ord	NPK	Nampak Ltd	SHO	Shoredits Holdings Ltd
ADC	Adcock-Ingram Ltd Ord	CNF	Congella Federation Ltd	GPI	Gypsum Industries Ltd	NRK	Northern Bakeries Ltd	SHP	Shoprite Hldgs Ltd Ord
ADR	Adcorp Hldgs Ltd Ord	CNL	Control Instruments Grp	GRC	Genrec Hldgs Ltd Ord	NRM	Norimed Ltd Ord	SHR	Shoprite Holdings Ltd
ADS	Advsource Holdings Ltd	CNN	Claude Neon Ltd Ord	GRF	Group Five Ltd	NRS	Noristan Hldgs Ltd Ord	SIS	Sun International (Sa)Ld
ADT	Advanced Tech Syst Ltd	CNS	Conshu Hldgs Ltd	GTA	Gentyre Industries -A-	NTR	Natal Ocean Trawling Ltd	SLC	Solchem Investment Hldgs
AFE	A E C I Ltd Ord	CNX	Conafex Hldgs Socie Anon	GUB	Gubb & Inggs Ltd Ord	NVC	Norvic Manufacturing Ltd	SNR	Sondor Industries Ltd
AFM	Afcom Group Ltd	COI	Choice Holdings Ltd	HAG	Haggie Ltd Ord	NWL	Nu-World Hldgs Ltd	SOL	Sasol Limited

AFX	African Oxygen Limited	COT	Coates Brothers S A Ltd	HCN	Hickson Chem Hldgs Ltd	OCE	Oceana Group Ltd	SPI	Spicer Holdings Ltd
AHH	Afrox Healthcare Ltd	CPK	Combined Packaging Ltd	HDC	Hudaco Industries Ltd	OHI	Ohio Group Ltd Ord	SPK	Sun Packaging Hldgs Ltd
AKJ	Arthur Kaplan Jewl Hldgs	CPN	Capricorn Inv Hldgs Ltd	HLH	Hunt Leuchars & Hepburn	OKO	O K Bazaars 1929 Ord	SPL	Spl Ltd
ALR	Fraser Alexander Ltd	CRG	Cargo Carriers Ltd	HRL	Harwill Invest Ltd	OMN	Omnia Holdings Ltd	SPM	Supreme Indust Hldgs Ltd
ALT	Allied Technologies	CRK	Cornick Group Ltd	ICS	I C S Holdings Ltd	OTS	Otis Elevator Co Ltd	SPS	Spescom Electronics Ltd
ALX	Alex White Holdings Ltd	CRM	Ceramic Industries Ltd	INM	Inmins Ltd Ord	PAL	Pals Holding Ltd	SPU	Spur Steak Ranches Ltd
AMI	Anglo Am Ind Corp Ld Ord	CRN	Crown Food Holdings Ltd	IPL	Imperial Holdings Ltd	PAM	Palabora Mining Co Ltd	SRT	Smart Centre Hldg Ltd
AMS	Amalgamated Shoes Ltd	CSB	Cashbuild Ltd	IRV	Irvin & Johnson Ltd	PBL	Picardi Beleggings Bpk	SUI	Sun International Ltd
AOO	Afr & Oseas Enterprs Ord	CSF	C G Smith Foods Ltd	ITE	Italtile Ltd	PDC	Pdc Holdings	SUN	Suncrush Ltd Ord
APG	Autopage Holdings Ltd	CTC	Computermatic Hldgs Ltd	ITL	Interleisure Ltd	PEI	Pep Ltd	TBS	Tiger Brands Ltd
APN	Aspen Healthcare Hldgs	CTL	Coastal Clothing Mnfrs	IVT	Invicta Holdings Ltd	PEN	Penrose Holdings Ltd	TCH	Technihire Ltd
APR	Adprom Holdings Ltd	CUL	Cullinan Holdings Ltd	JDG	Jd Group Ltd	PGR	Progress Ind Ltd Ord	TDX	Tedelex Ltd
ARK	Aimark Holdings Ltd	CVI	Capevin Investments Ltd	JGS	Jigsaw Holdings Ltd	PGS	Plate Glass Ind Ord	TFB	Tafelberg Furn Stores Ld
AEL	Allied Electronics Corp	CXN	Caxton Ltd New	JSC	Jasco Electron Hldgs Ltd	PHL	Picardi Holdings Ltd	TIM	Time Holdings Ltd
ATQ	Autoquip Group Ltd	DAE	Daewoo Electronics Sa Ld	KAR	Karos Hotels Ltd Ord	PIK	Pick N Pay Stores Ltd	TLJ	Teljoy Holdings Ltd

AVI	Anglovaal Industries Ord	DAG	Da Gama Textile Co Ltd	KLT	Klipton Ltd	PLS	Pleasure Foods Ltd	TME	Times Media Ltd
AWR	Allwear Ltd	DAH	Darling And Hodgson Ltd	KNJ	Knj Group Ltd	PON	Profurn Ltd	TMK	Tomkor Ltd Ord
BAW	Barloworld Ltd	DCH	Dispatch Media Ltd	KOH	Kohler Ltd Ord	POT	Brian Porter Hldg Ld Ord	TMT	Trimtex Trading Ltd
BCC	Blue Circle Ltd Ord	DDT	Dimension Data Hldgs Plc	LAB	Labat Africa Ltd	POW	Power Technologies Ord	TOC	Toco Holdings Ltd
BCF	Bowler Metcalf Ltd	DKL	Dukel Holdings Ltd	LAR	La Group Ltd Ord	PPC	Ppc Limited	TON	Tongaat Hulett Ltd
BFF	Buffalo Corporation Ord	DLF	Del Monte Royal Foods Ld	LDK	Landmarks Berhad Sa Ltd	PRP	Premier Pharmactl Co Ltd	TOY	Toyota S A Ltd
BLT	Bolton Industrial Hldgs	DLM	Dial-A-Movie Ltd	LGL	Leegall Clothing Ltd Ord	PTA	Putra-Sterling Ltd Ord	TPC	Transpaco Ltd
BOU	Boumat Ltd Ord	DLV	Dorbyl Ltd	LGM	Longmile Ltd	PWK	Pick N Pay Holdings Ltd	TRC	Transvaal Clothing Ind
BOY	Boymans Ltd Ord	DMG	Darmag Ltd	LNC	Lenco Holdings Ltd	QCK	Quick Holdings Ltd	TRE	Trencor Ltd
BRC	Brandcorp Holdings Ltd	DNL	Dunlop Africa Ltd Ord	LSR	Laser Transport Hldgs Ld	QDT	Q Data Ltd	TRH	Tradhld Ltd Ord
BRT	Barnetts Group Ltd	DNR	Debonair Group Ltd	LTA	L T A Ltd	QRM	Quorum Holdings Ltd	TRS	Tr Services Holdings Ltd
BSG	Basil Starke Group Ltd	DON	Don Group Ltd	LTH	Lithosaver Systems Ltd	RAP	Raptor Motor Hldgs Ltd	TSH	Tsogo Sun Holdings Ltd
BSR	Basil Read Hldgs Ltd	DPN	Drop-Inn Group Hldgs Ltd	MAC	Macphail Hldgs Ltd	RCL	Rcl Foods Limited	TSI	Technology Systems Int
BST	Bester Beleggings Ord	DSA	Disa Development Corp	MAH	Math & Ashley Hldgs	RLO	Reunert Ltd	TUN	T & N Holdings Ltd
BTD	Bergers Trading Hdgs Ltd	DST	Distell Group Ltd	MAS	Masonite Africa Ltd	RLY	Relyant Retail Ltd	UDV	Unidev Ltd

BTG	Bytes Technology Grp Ltd	DTA	Delta Emd Ltd	MBN	Mobile Industries Ld -N-	RMA	Romano Furniture Ltd	UHS	Unihold Ltd Ord
BTS	British American Tobacco	DTR	Datakor Ltd	MCK	Metclick Ltd	RMS	Romens Holdings Ltd	UNG	Universal Growth Hldgs
BVC	Beverage & Con Ind Hldgs	DXL	Dextral Industries Ltd	MDC	Medi-Clinic Corp Ltd Ord	RNT	Rentmeester Bel Bpk	UNS	Unispin Holdings Ltd
BVT	Bidvest Ltd	ECO	Edgars Cons Stores Ltd	MDM	Macadams Bakery Supplies	ROM	Romatex Ltd	URQ	Urquhart Motor Grp Hldg
BWR	Bolton Footwear Ltd	EGN	Engen Ltd	MHL	Mas Holdings Ltd	RSF	The Rusfurn Group Ltd	USV	United Serv Technologies
BZK	Berzack Bros Hldgs	EHS	Evraz Highveld Steel & Van	MIC	Micor Holdings Ltd	RTC	Retail Corporation	UTR	Unitrans Ltd
CAS	Cadbury Schweppes	ELC	Elcentre Corporation Ltd	MIM	Midmacor Industries Ltd	RTO	Rex Trueform Cloth Co Ld	VKT	Vektra Corporation Plc
CAT	Caxton Ctp Publish Print	ELE	Elementone Ltd	MLB	Malbak Ltd Ord	RUH	Rubenstein Holdings Ltd	VLH	Valhold Ltd
CFR	Compagnie Fin Richemont	ELH	Ellerine Holdings Ltd	MLS	Milstan Holdings Ltd	SAB	S A Breweries Ltd Ord	VLT	Vaalauto Ltd
CGS	C.G.Smith Ltd	ELR	Elb Group Ltd	MMD	Macmed Health Care Ltd	SAF	Saficon Investments Ltd	VLX	Voltex Holdings Ltd Ord
CGW	Consol Ltd	EQR	Equikor Holdings Ltd	MNX	Monex Ltd	SAI	S.A. Bias Industries Ltd	VRX	Varex Corporation Ltd
CHE	Chemical Services Ord	ERL	Environmental Resources	MPC	Mr Price Group Ltd	SAP	Sappi Ltd	WAL	Waltons Stationery
CHU	Chubb Holdings Ltd	ERV	Eurevest Ltd	MSC	Musica Holdings Ltd Ord	SCF	Sho-Craft Ltd	WBH	W B Holdings Ltd
CKS	Crookes Bros Ltd	EVT	Everite Group Ltd	MTA	Metair Investments Ltd	SCG	Scharrighuisen Hldgs Ltd	WBO	Wilson Bayly Hlm-Ovc Ltd
CLB	Columbia Consultants Ltd	FAG	Farm-Ag Ltd Ord	MTK	Metkor Group Ltd	SCM	Sentrachem Ltd Ord	WDR	Woodrow Holdings Ltd
CLC	Clinic Holdings Ltd	FAM	Frame Group Ltd	MTX	Metorex Ltd	SCR	Score Food Hldgs Ltd	WES	Wesco Investments Ltd

CLG	Clegg Holdings Ltd	FDC	Foodcorp Ltd	MUR	Murray & Roberts Hld Ord	SDG	Sa Druggists Ltd	WNH	Winhold Ltd
								WYN	Wayne Manufacturing Ltd
								YRK	The York Timber Org
								ZCI	Zambia Copper Inv Ld Ord
								ZRR	Zarara Energy Ltd

Appendix 2: Transitional survivors operating within crisis periods one and two

Number	Code	Name	Period 1 (1990-1998)	Period 2 (2004-2012)
1	ABI	Amalgamated Beverage Ind	✓	
2	ACL	Arcelormittal Sa Limited	✓	✓
3	ADC	Adcock-Ingram Ltd Ord	✓	
4	ADS	Advsource Holdings Ltd	✓	
5	ADT	Advanced Tech Syst Ltd	✓	
6	AHH	Afrox Healthcare Ltd	✓	
7	ALR	Fraser Alexander Ltd	✓	
8	ALT	Allied Technologies	✓	✓
9	ALX	Alex White Holdings Ltd	✓	
10	APG	Autopage Holdings Ltd	✓	
11	ATQ	Autoquip Group Ltd	✓	
12	BAW	Barloworld Ltd	✓	✓
13	BLT	Bolton Industrial Hldgs	✓	
14	BOU	Boumat Ltd Ord	✓	
15	BSR	Basil Read Hldgs Ltd	✓	✓
16	BTG	Bytes Technology Grp Ltd	✓	
17	BTS	British American Tobacco	✓	
18	BVC	Beverage & Con Ind Hldgs	✓	
19	BWR	Bolton Footwear Ltd	✓	
20	CAS	Cadbury Schweppes	✓	
21	CGS	C.G.Smith Ltd	✓	
22	CHE	Chemical Services Ord	✓	
23	CLC	Clinic Holdings Ltd	✓	
24	CLY	Clyde Industrial Corp	✓	
25	CMT	Cementation Co Afr Ltd	✓	
26	CNC	Concor Ltd	✓	
27	CNL	Control Instruments Grp	✓	✓
28	CNS	Conshu Hldgs Ltd	✓	
29	CNX	Conafex Hldgs Socie Anon	✓	
30	COI	Choice Holdings Ltd	✓	
31	COT	Coates Brothers S A Ltd	✓	
32	CPN	Capricorn Inv Hldgs Ltd	✓	
33	CRM	Ceramic Industries Ltd	✓	✓
34	CSF	C G Smith Foods Ltd	✓	
35	CTL	Coastal Clothing Mnfrs	✓	
36	CVI	Capevin Investments Ltd	✓	
37	CXN	Caxton Ltd New	✓	
38	DAE	Daewoo Electronics Sa Ld	✓	
39	DAG	Da Gama Textile Co Ltd	✓	
40	DDT	Dimension Data Hldgs Plc	✓	

41	DLV	Dorbyl Ltd	✓	✓
42	DNL	Dunlop Africa Ltd Ord	✓	
43	DON	Don Group Ltd	✓	✓
44	DTA	Delta Emd Ltd	✓	✓
45	ECO	Edgars Cons Stores Ltd	✓	
46	EHS	Evraz Highveld Steel & Van	✓	✓
47	ELE	Elementone Ltd	✓	
48	ELH	Ellerine Holdings Ltd	✓	
49	FIN	Fintech Ltd	✓	
50	FSC	Fasic Ltd	✓	
51	GOC	General Optical Ltd Ord	✓	
52	GRF	Group Five Ltd	✓	✓
53	GUB	Gubb & Inggs Ltd Ord	✓	
54	HLH	Hunt Leuchars & Hepburn	✓	
55	HRL	Harwill Invest Ltd	✓	
56	INM	Inmins Ltd Ord	✓	
57	IRV	Irvin & Johnson Ltd	✓	
58	JDG	Jd Group Ltd	✓	✓
59	JGS	Jigsaw Holdings Ltd	✓	
60	KAR	Karos Hotels Ltd Ord	✓	
61	KLT	Klipton Ltd	✓	
62	LAB	Labat Africa Ltd	✓	✓
63	LAR	La Group Ltd Ord	✓	
64	LNC	Lenco Holdings Ltd	✓	
65	LSR	Laser Transport Hldgs Ld	✓	
66	LTA	L T A Ltd	✓	
67	LTH	Lithosaver Systems Ltd	✓	
68	MDM	Macadams Bakery Supplies	✓	
69	MLB	Malbak Ltd Ord	✓	
70	MMD	Macmed Health Care Ltd	✓	
71	MNX	Monex Ltd	✓	
72	MTK	Metkor Group Ltd	✓	
73	MTX	Metorex Ltd	✓	
74	MUR	Murray & Roberts Hld Ord	✓	✓
75	MZG	Metje & Ziegler Ltd Ord	✓	
76	NEI	Northern Eng Ind Afr Ltd	✓	
77	NIN	Ninian & Lester Hldgs	✓	
78	NMS	Namibian Sea Products Ld	✓	
79	PAL	Pals Holding Ltd	✓	
80	PAM	Palabora Mining Co Ltd	✓	✓
81	PEI	Pep Ltd	✓	
82	PGS	Plate Glass Ind Ord	✓	

83	PON	Profurn Ltd	✓	
84	POW	Power Technologies Ord	✓	
85	QCK	Quick Holdings Ltd	✓	
86	RLY	Relyant Retail Ltd	✓	
87	RNT	Rentmeester Bel Bpk	✓	
88	ROM	Romatex Ltd	✓	
89	RTC	Retail Corporation	✓	
90	SAP	Sappi Ltd	✓	✓
91	SCG	Scharrighuisen Hldgs Ltd	✓	
92	SDG	Sa Druggists Ltd	✓	
93	SFR	Safmarine & Rennies Ord	✓	
94	SFW	Stellenbsch Farmers Wine	✓	
95	SIS	Sun International (Sa)Ld	✓	
96	SNR	Sondor Industries Ltd	✓	
97	SPI	Spicer Holdings Ltd	✓	
98	SPS	Spescom Electronics Ltd	✓	
99	SPU	Spur Steak Ranches Ltd	✓	
100	TLJ	Teljoy Holdings Ltd	✓	
101	TOC	Toco Holdings Ltd	✓	
102	TOY	Toyota S A Ltd	✓	
103	UHS	Unihold Ltd Ord	✓	
104	UNG	Universal Growth Hldgs	✓	
105	UNS	Unispin Holdings Ltd	✓	
106	UTR	Unitrans Ltd	✓	
107	VLT	Vaalauto Ltd	✓	
108	VLX	Voltex Holdings Ltd Ord	✓	
109	WBH	W B Holdings Ltd	✓	
110	WES	Wesco Investments Ltd	✓	
111	ZCI	Zambia Copper Inv Ld Ord	✓	
112	ZRR	Zarara Energy Ltd	✓	

Appendix 3: Descriptive statistics

Descriptive statistics of transitional survivors (period one)

	N	Mean	Median	Standard deviation	Skewness	Sk$_p$
Variables						
Gross profit performance measure (post-crisis)	112	0.170	0.164	0.072	0.638	0.262
ROA performance measure (post-crisis)	112	0.072	0.071	0.049	0.605	0.089
Human resource slack	78	0.008	0.006	0.006	1.601	1.029
Capacity Slack	106	0.284	0.156	0.392	3.429	0.978
Supply chain slack	106	0.159	0.144	0.148	-0.276	0.298
Unabsorbed slack	112	0.191	0.195	0.176	0.006	-0.078
Available slack	112	1.616	1.495	0.818	2.626	0.444
Absorbed slack	106	0.202	0.176	0.135	2.927	0.566
Potential slack	112	0.154	0.105	0.178	2.007	0.829
Control variables						
Firm size^L	78	7.943	8.218	1.711	-0.133	-0.482
Firm age^L	112	2.318	2.015	0.955	0.357	0.951
Intangible assets ratio	112	0.055	0.000	0.129	3.082	1.265
Gross profit performance measure (1993)	110	0.168	0.156	0.099	0.999	0.371
ROA performance measure (1993)	110	0.069	0.071	0.073	1.093	-0.080
^{L}Indicates natural log transformations (Sk$_p$: Pearson's coefficient of skewness)						

Descriptive statistics of champions (period one)

	N	Mean	Median	SD	Skewness	Sk$_p$
Variables						
Gross profit performance measure (post-crisis)	53	0.205	0.196	0.075	0.330	0.344
ROA performance measure (post-crisis)	53	0.086	0.083	0.046	0.121	0.215
Human resource slack	39	0.007	0.005	0.005	2.787	0.827
Capacity Slack	52	0.296	0.156	0.348	2.856	1.204
Supply chain slack	52	0.148	0.141	0.156	0.088	0.126
Unabsorbed slack	53	0.179	0.156	0.182	0.730	0.377
Available slack	53	1.563	1.397	0.774	2.450	0.645
Absorbed slack	52	0.168	0.167	0.081	0.017	0.012
Potential slack	53	0.165	0.128	0.182	1.847	0.605
Control variables						
Firm size^L	39	8.459	8.237	1.560	-0.225	0.427
Firm age^L	53	2.813	3.199	1.055	-0.239	-1.097
Intangible assets ratio	53	0.037	0.000	0.083	3.816	1.320
Gross profit performance measure (1993)	53	0.191	0.185	0.078	0.910	0.219
ROA performance measure (1993)	53	0.073	0.073	0.069	2.843	0.011
^{L}Indicates natural log transformations Sk$_p$ indicates Pearson's coefficient of skewness						

Descriptive statistics of champions (period two)

	N	Mean	Median	Standard deviation	Skewness	Sk$_p$
Variables						
Gross profit performance measure (post-crisis)	53	0.225	0.221	0.105	0.675	0.128
ROA performance measure (post-crisis)	53	0.096	0.096	0.047	0.280	-0.019
Human resource slack	51	0.002	0.001	0.001	1.170	0.783
Capacity Slack	53	0.267	0.178	0.269	1.652	0.992
Supply chain slack	53	0.071	0.056	0.178	1.446	0.256
Unabsorbed slack	53	0.191	0.193	0.178	0.358	-0.034
Available slack	53	1.734	1.518	0.915	2.025	0.708
Absorbed slack	53	0.158	0.154	0.091	1.291	0.136
Potential slack	53	0.158	0.090	0.193	1.958	1.061
Control variables						
Firm size^L	51	8.347	8.255	1.491	0.181	0.186
Firm age^L	53	3.550	3.651	0.546	0.060	-0.551
Intangible assets ratio	53	0.068	0.027	0.088	1.678	1.400
Gross profit performance measure (1993)	53	0.252	0.242	0.103	0.630	0.292
ROA performance measure (1993)	53	0.117	0.105	0.067	2.768	0.577
^{L}Indicates natural log transformations (Sk$_p$: Pearson's coefficient of skewness)						

Appendix 4: Correlation matrices including control variables

Correlation matrix of transitional survivors in period one (post crisis)

	Variables	1	2
1	Gross profit performance measure (post-crisis)	-	
2	ROA performance measure (post-crisis)	.673*	-
10	firm size	-.171	.066
11	firm age	-.049	.000
12	Intangible Assets Ratio	.108	-.004
13	Gross profit performance (pre-crisis)	.685*	.332*
14	ROA Pre-crisis	.478*	.467*

* Marked correlations are significant at $p < .050$.

Correlation matrix of champions in period one (post crisis)

	Variables	1	2
1	Gross profit performance measure (post-crisis)	-	
2	ROA performance measure (post-crisis)	.694*	-
10	firm size	-.335*	-.121
11	firm age	-.081	.064
12	Intangible Assets Ratio	-.046	.014
13	Gross profit performance (pre-crisis)	.762*	.608*
14	ROA Pre-crisis	.195	.204

* Marked correlations are significant at $p < .050$.

Correlation matrix of champions in period two (post crisis)

	Variables	1	2
1	Gross profit performance measure (post-crisis)	-	
2	ROA performance measure (post-crisis)	.783*	-
10	firm size	.236	.170
11	firm age	.210	.140
12	Intangible Assets Ratio	.063	.113
13	Gross profit performance (pre-crisis)	.646*	.426*
14	ROA Pre-crisis	.184	.300*

* Marked correlations are significant at $p < .050$.

Appendix 5: Variance inflation factors

	Period 1		Period 2
	Transitional survivor	**Champion**	**Champion**
Gross profit performance measure			
Human resource slack	1.238	1.236	1.483
Available slack	1.209	1.264	1.998
Absorbed slack	1.596	1.410	1.912
Potential slack	1.146	1.266	1.368
Control variables			
Firm size	1.413	1.247	1.305
Firm age	1.224	1.538	1.259
Intangible assets ratio	1.520	1.325	1.329
Gross profit performance measure (pre-crisis)	1.556	1.908	3.850
ROA performance measure (pre-crisis)	1.700	1.659	3.112
ROA performance measure			
Capacity slack	1.155	1.292	1.099
Supply chain slack	1.184	1.207	1.329
Control variables			
Firm size	1.345	1.137	1.143
Firm age	1.212	1.246	1.120
Intangible assets ratio	1.285	1.269	1.185
Gross profit performance measure (pre-crisis)	1.511	2.180	3.113
ROA performance measure (pre-crisis)	1.523	1.803	3.021

Appendix 6: Homoscedastic plots

Gross profit performance measure
(champions in period 1)

Gross profit performance measure
(champions in period 2)

Gross profit performance measure
(transitional survivors in period 1)

ROA performance measure
(Champions in period 1)

ROA performance measure
(Champions in period 2)

ROA performance measure
(transitional survivors in period 1)
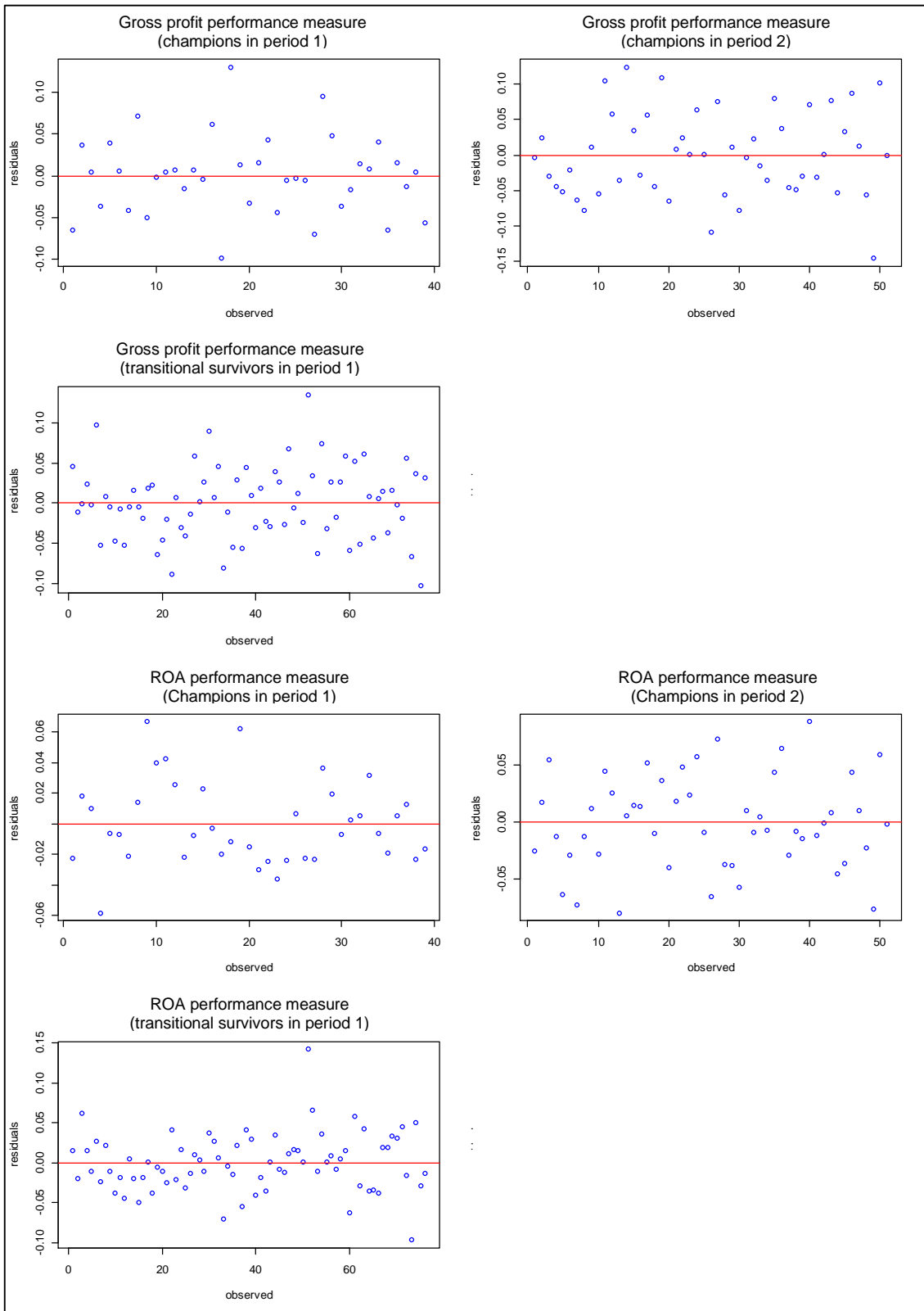
Appendix 7: Ethical Approval

07 September 2017

Ronnel Yankanna-Mohan

Dear Ronnel,

Please be advised that your application for Ethical Clearance has been approved.

You are therefore allowed to continue collecting your data.

We wish you everything of the best for the rest of the project.

Kind Regards

GIBS MBA Research Ethical Clearance Committee

Gordon Institute of Business Science
Reg. No. 99/19816/08

26 Melville Road, Illovo, Johannesburg
PO Box 787602, Sandton, 2146, South Africa

telephone **(+27) 11 771 4000**
fax **(+27) 11 771 4177**

website **gibs.co.za**
University of Pretoria

145