

Full Length Research paper

Investigating the dynamic capabilities and competitive advantage of South African SMEs

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This study investigates the dynamic capabilities (DCs) and competitive advantage of South African small and medium enterprises (SMEs). DCs are organisational processes purposefully designed to alter the “firm’s resource base” in order to achieve competitive advantage in a rapidly changing environment. DCs govern a firm’s “valuable, rare, inimitable and non-substitutable” organisational resources. Research has shown that South African SMEs contribute approximately 35% to the national gross domestic product. SMEs are significant in their contributions to economic growth, innovation of new products, technological progress and competitive advantage. However, most SMEs are confronted with challenges such as; changes in technologies, innovative products, customer demands, and the desire to remain flexible. SMEs are often faced with competitive forces which threaten their survival. The failure rate of SMEs is much higher than that of larger organisations. South African SMEs fail at a rate of between 70 and 80%. SMEs need DCs to achieve competitive advantage in fast changing business environments. Research on DC has been on a piecemeal basis. An empirical research on SMEs’ DC from a developing countries context has not received wide attention. Through an online based survey of South African SMEs, our paper provides an insight into the types of organisational capabilities or DCs that can lead to competitive advantage within the SMEs. The statistical findings clarify the notion that DCs alone cannot lead to competitive advantage. It was found that sensing, integrative and behavioural capabilities are part of DC constructs: this study extends the used four DC constructs (absorptive, adaptive, innovative and networking capabilities) to include sensing, integrative and behavioural capabilities. The findings show DCs have significant impacts on competitive advantage, and are capable of influencing SMEs’ valuable, rare, inimitable and non-substitutable (VRIN) resources to achieve competitive advantage in a fast changing business environment.

Key words: Competitive advantage, dynamic capability, small and medium enterprises.

INTRODUCTION

Small and medium enterprises (SMEs) are the main drivers of innovation - the main source of competitive advantage, and economic development of most developing countries (Crossan and Apaydin, 2009; Dess and Picken, 2000; Donner, 2007; Kotelnikov, 2007; Wang and Ahmed, 2004). SMEs in South Africa are classified as having less than 250 employees (National

Small Business Amendment Act, 2003). SMEs contribute approximately 35% to the national gross domestic product (GDP), and are significant in their contributions to economic growth, innovation of new products, technological progress and competitive advantage (AMTS, 2002; Berry et al., 2002; Frempong, 2007; Johnston et al., 2008; Kotelnikov, 2007; Nieto and Fernandez, 2006; Sawers et al., 2008). Duan et al. (2002) established that SMEs are vital to the economic stability of nations. Since SMEs dominate the South African economy, their contributions cannot be ignored (Sawers et al., 2008).

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SMEs are characterised by limited capabilities, and are often faced with competitive forces which threaten their survival (Cragg et al., 2006; Di Maria and Micelli, 2008; Eikebrokk and Olsen, 2007; Parida et al., 2009; Pavic et al., 2007; Pillania, 2008). Most SMEs are confronted with challenges such as changes in technologies, innovative products, customer demands, and the desire to remain flexible (Abor and Quartey, 2010; Parida, 2008). The failure rate of SMEs is much higher than that of large organisations (Terziovski, 2010). It is noted that South African SMEs fail at the rate of between 70 and 80% (Fatoki and Smit, 2011; Van Eeden et al., 2003).

The potential of SMEs to achieve competitive advantage has become the major concern of both managers and researchers (Rivard et al., 2006). SMEs need more than ordinary capabilities in dynamic environments; SMEs need strong capabilities to innovate and adapt to changing environment (Kotelnikov, 2007; Lindblom et al., 2008). It is essential for SMEs to develop DCs that support business strategies in order to achieve competitive advantage in fast changing business conditions (Lindblom et al., 2008). A number of scholars have argued that DC alone cannot lead to competitive advantage or improve firm performance (Eisenhardt and Martin, 2000; Zahra et al., 2006), while others disagreed (Teece, 2007; Zollo and Winter, 2002). This disagreement has impeded the progress of empirical studies of DCs (Easterby-Smith et al., 2009). Although, DC has received attention from scholars in different research fields, a universally recognised definition of DC is yet to emerge (Easterby-Smith et al., 2009). In spite of the growing interest of a DC perspective, DC studies remain conceptual and theoretical (Ambrosini and Bowman, 2009; Zhou and Li, 2010). Research on DC has been on a piecemeal basis (Wang and Ahmed, 2007), and empirical studies of DCs are rare (Ambrosini and Bowman, 2009; Narayanan et al., 2009). An empirical research on SMEs' DCs from a developing countries context has not received wide attention (Parida, 2008).

Although, a number of studies have been done on DCs, very little work has been undertaken to identify how DCs lead to competitive advantage. More studies are required to understand the types of organisational capabilities or DCs to achieve and maintain competitive advantage within the SMEs (Borch and Madsen, 2007). This study aims to examine the types of organisational capabilities or DCs that can lead to competitive advantage within the SMEs. This paper discusses the literature review of DCs and the competitive advantage.

DYNAMIC CAPABILITIES

Dynamic capability (DC) is an extension of the resource-based view (RBV) and hence, shares similar assumptions (Ambrosini and Bowman, 2009; Newbert, 2008; Schreyogg and Kliesch-Eberl, 2007). RBV is a significant

theoretical approach to understand how firms achieve and maintain competitive advantage (Kraaijenbrink et al., 2010; Lockett et al., 2009; Sawers et al., 2008). RBV emphasises heterogeneous firms' resources which may be tangible or intangible. Resource based theorists agree that firms possess accumulated heterogeneous resources and are equally concerned with how firms achieve competitive advantage (Ambrosini and Bowman, 2009; Denrell et al., 2003; Zhou and Li, 2010). DCs are organisational processes purposefully designed to alter the firm's resource base (which are resources that can enable a firm to accomplish its aims) in order to achieve sustainable competitive advantage (SCA) in rapidly changing environmental conditions (Helfat et al., 2007). DC is a set of abilities that enable a firm to respond quickly to new opportunities, and is concerned with how to rejuvenate and integrate a firm's resources (Schilling, 2006; Zhou and Li, 2010). DC involves repeated processes that influence the firm's resource base and hence governs firm's VRIN: valuable, rare, inimitable and non-substitutable resources (Ambrosini and Bowman, 2009; Helfat et al., 2007).

Valuable resources are operational capabilities, superior capabilities or substantive capabilities (Lindblom et al., 2008; Winter, 2003; Zahra et al., 2006) which allow firms to meet current needs or immediate demands that can improve the effectiveness of the firm (Ambrosini and Bowman, 2009; Perez and De Pablos, 2003). Valuable resources provide firms with the required flexibility to respond to environmental opportunities and pressures. Rareness indicates that the resources are scarce and are not possessed by the competitors. Inimitable implies that, the resources cannot be easily duplicated or copied by rivals, such as scientific discovery, brand name and so on. Non-substitutable means the resources are not easily replaced or substituted (Newbert, 2008; Perez and De Pablos, 2003; Ren et al., 2010; Sirmon et al., 2007; Terziovski, 2010). Like RBV, DC focuses on a firm performance and competencies, although DC's emphasis is on dynamics: that is, change (Easterby-Smith et al., 2009). However, only the DC perspective out rightly examines how firms can create and sustain competitive advantage in fast changing environments (Ambrosini and Bowman, 2009). More importantly, DCs enable firms to generate and maintain long-term returns in a fast changing environment (Ambrosini and Bowman, 2009; Helfat et al., 2007). The role of DC is to influence a firm's existing resource base such that new VRIN resources are created to achieve SCA (Ambrosini and Bowman, 2009).

To achieve SCA, SMEs need to take advantage of valuable resources and external environmental changes (Ambrosini and Bowman, 2009). DC includes a firm's ability to sense and capitalise on new market opportunities (Wilden et al., 2009). While in a competitive environment, firms need to develop DCs to survive (Zhou and Li, 2010), and SMEs need to develop more intense capabilities than large firms so as to overcome

the liability of smallness and outperform competitors (Borch and Madsen, 2007; Terziovski, 2010). A number of studies have been done on DC (Narayanan et al., 2009; Newey and Zahra, 2009; McKelvie and Davidsson, 2009; Teece, 2007; Zahra et al., 2006; Zhou and Li, 2010; Zollo and Winter, 2002), and DC has been conceptualised as a firm's capacity to sense, create, extend, modify, reconfigure, integrate and renew its ordinary or core capabilities to achieve and maintain competitive advantage in fast changing environments (Ambrosini and Bowman, 2009; Helfat et al., 2007; Wang and Ahmed, 2007; Winter, 2003). Based on ten years of DCs review, Wang and Ahmed (2007) identified three capabilities (absorptive capability, adaptive capability and innovative capability) as the core components of DC. Parida (2008) suggested that networking capability should be a part of DCs constructs. Two other capabilities: sensing and integrative capabilities were found in the literature (Jusoh and Parnell, 2008; Lindblom et al., 2008; Morgan et al., 2009).

Many studies focused on the definition and nature of DCs (McKelvie and Davidsson, 2009; Teece, 2007; Winter, 2003), while others examined the effects and consequences of the DC on firms' performances and competitive advantages (Augier and Teece, 2008; Easterby-Smith et al., 2009). The six major DC constructs – sensing, absorptive, adaptive, innovative, networking and integrative capabilities are further discussed here.

Sensing capability

Sensing capability, as one of the main sources of competitive advantage, is the ability of the firm to learn promptly about competitors, customers and the business environments (Lindblom et al., 2008; Morgan et al., 2009) ahead of rivals. Consequently, firms with sensing capability demonstrate anticipatory skills, making it possible to understand customers' demands ahead of competitors (Morgan et al., 2009). Sensing capability is fundamentally, the ability of the firm to use market intelligence and be cognisant or aware of market change so as to predict more accurately customers' responses to change (Lindblom et al., 2008). In other words, sensing capability can enable SMEs to gather valuable market information and interpret the information to gain SCA and superior performance (Lindblom et al., 2008).

Absorptive capability

Ideally, after firms have acquired sensing capability, they move on to acquire absorptive capability. Absorptive capability is located within the fields of DC, organisational learning and knowledge management (Easterby-Smith et al., 2008), and hence the firm's ability or

capacity to recognise (know the value), develop and utilise external knowledge to create valuable new knowledge (Lane et al., 2006; Zhou and Li, 2010). Significantly in dynamic environments, absorptive capability is a source of competitive advantage as the new/acquired knowledge is transformed into usable knowledge (Cadiz et al., 2009; Zhou and Li, 2010). Thus, firms with high levels of absorptive capability are highly innovative, as the capability complements and reinforce the firm's resource base to accurately predict future technological developments (Lane et al., 2006; Zhou and Li, 2010). Absorptive capability can help SMEs to advance in technological fields and outperform competitors (Wetter and Delmar, 2007).

In addition, absorptive capability involves application of environmental knowledge acquired through organisational learning processes to improve business strategies (Lane et al., 2006). Exploiting and retaining absorptive capability is essential for long-term survival of SMEs (Lane et al., 2006). Sourcing both external and internal knowledge is crucial to developing absorptive capability (Volberda et al., 2009).

Adaptive capability

After absorptive capability, firms need to possess adaptive capability. Zhou and Li (2010) viewed adaptive capability as a key element of DC. Adaptive capability is the firm's ability to quickly reconfigure and coordinate its resources in response to rapid environmental changes (Gibson and Birkinshaw, 2004; Sapienza et al., 2006; Zhou and Li, 2010). In other words, adaptive capability is the ability of a firm to respond to external changes ahead of competitors through reconfiguration of its internal resources and processes (Zhou and Li, 2010). In DCs perspective, competitive advantage is obtained through continuous development and reconfiguration of valuable assets (Augier and Teece, 2008; Teece, 2007).

Innovative capability

Adaptive capability should enhance the innovative capability of firms. Innovation is a significant source of competitive advantage in changing or dynamic business environments, and it is basically a new way of doing things: "a new good or a new quality of good; a new method of production; a new market; a new source of supply; or a new organisational structure" (Dess and Picken, 2000; Crossan and Apaydin, 2009). Firms' success and survival depends largely on their ability to create value; their ability to innovate (Wang and Ahmed, 2004). Firms with high innovative capability outperform competitors, and have "demonstrate higher profitability, greater market value, superior credit ratings, and higher survival probabilities" because competitive advantage

increases with innovation (Volberda et al., 2009). As a result, innovation capability determines firm's performance in dynamic conditions (Crossan and Apaydin, 2009). It is highly imperative for SMEs to advance in innovative ability by capitalising on knowledge from external sources to build innovation capability (Borch and Madsen, 2007; Volberda et al., 2009). Innovation of new processes and products originates from combination of newly acquired knowledge, renewal of organisational strategies and processes to obtain SCA (Augier and Teece, 2008). SCA depends on a firm's abilities to effectively develop internal knowledge and exploit external knowledge to improve on the innovative capability of the firm (Fabrizio, 2009).

Networking capability

Networking capability is the ability of the firm to create and utilise inter-organisational relationships to acquire various resources (Walter et al., 2006). It is the firms' abilities to be strategically positioned in the network and thus establish beneficial relationships with chosen partners (Hagedoorn et al., 2006). SMEs must be able to use inter-organisational relationships to improve business performance and acquire SCA in fast changing business environments (Walter et al., 2006). To achieve and sustain competitive advantage, SMEs can collaborate with suppliers and certain competitors to build a powerful network. Therefore, inter-organisation collaboration can assist SMEs to be highly innovative, as it exposes firms to new technologies and new business strategies (Sawers et al., 2008).

Integrative capability

Integrative capability is the firm's ability to combine all the resources and competencies acquired from sensing, adoptive, adaptive, networking and innovative capabilities, and harmonising them to generate SCA in fast changing business conditions. Integrative capability enhances a firm's performance (Jusoh and Parnell, 2008), and it involves the alignment of external knowledge with internal knowledge to meet the goals and objectives of the firm. SMEs with integrative capability should be able to harmonise both internal resources and capabilities (internal integration) with external resources and capabilities (external integration), to create values in dynamic conditions.

In addition, integrative capability is the ability of a firm to effectively manage internal and external changes. SMEs with integrative capability can synchronise past experiences with capabilities (resources and competencies), and exploit them within a firm without causing any havoc to firm. Firms with integrative capability are high-risk takers, and thus embrace new technologies

easily. In other words, SMEs with integrative capability possess high innovative capability leading to SCA.

It is necessary, therefore, to understand the types of DCs that can significantly impact on SMEs' competitive advantage, as Ambrosini and Bowman (2009: 36) argued that sensing capability is not DC, but is "managerial and organisational processes that underpin and enable the deployment of dynamic capabilities".

Competitive advantage

Competitive advantage is the firm's ability to implement a new market strategy that facilitates price reduction, productivity and ample utilization of market opportunities (Africa Competitiveness Report, 2009; Newbert, 2008). Competitive advantage is the ability to create value (Africa Competitiveness Report, 2009), and "the degree to which a firm has reduced costs, exploited opportunities, and neutralized threats" (Newbert, 2008). In other words, competitive advantage is the firm's ability to deploy valuable processes and resources, not implemented by the competitors, which can provide firms with opportunity over their competitors. Firms' resources (which are tangible and intangible assets, human assets and all other activities that enable firms to create values) and capabilities are the main source of competitive advantage. Tangible assets must combine with intangible assets in other to achieve SCA (Lindblom et al., 2008; Perez and De Pablos, 2003).

Gathering bundles of resources does not guarantee SCA, because the resources that will provide competitive advantage cannot be bought but must be gradually developed/built within the firm (Borch and Madsen, 2007). Resources alone cannot provide SCA but must be transformed into capabilities (Borch and Madsen, 2007). Therefore, SMEs must possess distinctive capabilities to compete in rapidly changing environments which can be perceived from their ability to introduce new concepts, new process, new strategy, and their ability to adapt to change. The type of change (which can be in process, product or service) and the degree of change (which can be radical or incremental) that occur within a firm during a period reveals how innovative it is, and hence the probability of acquiring SCA (Tidd et al., 2001).

SMEs need to continually grow by being highly innovative to achieve and maintain competitive advantage (Cadiz et al., 2009). There are five main constructs identified from research on innovation: process, market, strategic, product and behavioural innovativeness (Wang and Ahmed, 2004; Crossan and Apaydin, 2009). Process innovativeness is the ability of a firm to introduce a new production method, new technology or new management approach (Crossan and Apaydin, 2009), for example, Cisco introduced a new approach to production and management in their net readiness approach (Hartman and Sifonis, 2000). Market

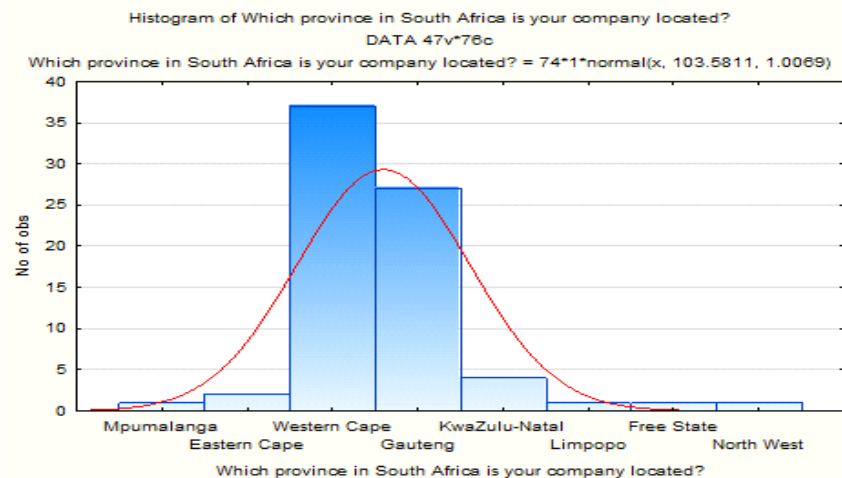


Figure 1. Location of SMEs in the sample.

innovativeness is related to product innovativeness, but market innovativeness is a new approach introduced by the firm to exploit a niche market (Wang and Ahmed, 2004) for example, the case of Amazon using the World Wide Web (WWW) to market books (Friedman, 2006). Strategic innovativeness is the ability of the firm to discover lapses in the established markets and develop valuable new competitive strategies (Winter, 2003; Wang and Ahmed, 2004) for example, the case of Dell cutting out the middlemen and selling directly to final consumers (Friedman, 2006). Product innovativeness is associated with long-term business success, the extent to which a newly introduced product is perceived to be useful to customers (Wang and Ahmed, 2004) for example, Apple's iPhone and iPad (Friedman, 2006). Innovative products are intentionally introduced to meet the needs of some customers, which were previously neglected. Behavioural innovativeness has three different levels: individual innovativeness (individual's willingness to change), team innovativeness (adaptive ability of the team in response to change) and managerial innovativeness (management's commitment and willingness to new ways of doing things) (Crossan and Apaydin, 2009), for example, Cisco management's innovation in putting all company documents, forms, procedures and policies on their intranet for staff (Hartman and Sifonis, 2000).

RESEARCH METHODOLOGY

This study begins with a conceptual and theoretical structure and moves towards empirical evidence; therefore the approach to theory is deductive (Cavana et al., 2001; Welman et al., 2005). This study is exploratory in nature, and takes a positivist stance. This study examines the impact of DCs on competitive advantage of South African SMEs in changing environments.

Based on the experiences and involvement in business practices, an individual responsible for information technology (IT) in South

African SMEs were selected for this study. This study employed judgment sampling; a type of purposive sampling, to investigate the phenomenon under study. An attempt was made to get the initial contacts of South African SMEs via Regional Chambers of Commerce, Proudly South African and business parks.

This study involved a large and geographically dispersed community and an online based questionnaire was considered appropriate for the data collection. The questions were adapted from a previous study (Parida, 2008). The questionnaire was designed to determine:

- 1) Business profile – the location of the business, length of business operation and type of industry.
- 2) Dynamic capabilities – sensing capability, absorptive capability, adaptive capability, innovative capability, networking capability, integrative capability.
- 3) Competitive advantage – process innovativeness, market innovativeness, strategic innovativeness, product innovativeness, behavioural innovativeness.
- 4) Impact of dynamic capabilities on competitive advantage.

RESULT AND ANALYSIS

Company location

The majority of SMEs in South Africa are located in Gauteng province (Rogerson, 2000). Perhaps, due to the awareness of the institution in the Western Cape; fifty percent of the SMEs in the sample are located in the Western Cape province, with thirty-seven percent located in Gauteng. The details are shown in Figure 1.

Length of business operation

The sample of SMEs appears to be of the more resilient SMEs, as almost 70% have been in operation for longer than 5 years (as shown in Figure 2). Fifty-four percent had been in operation for more than 10 years, and thus should have had ample time to build DCs.

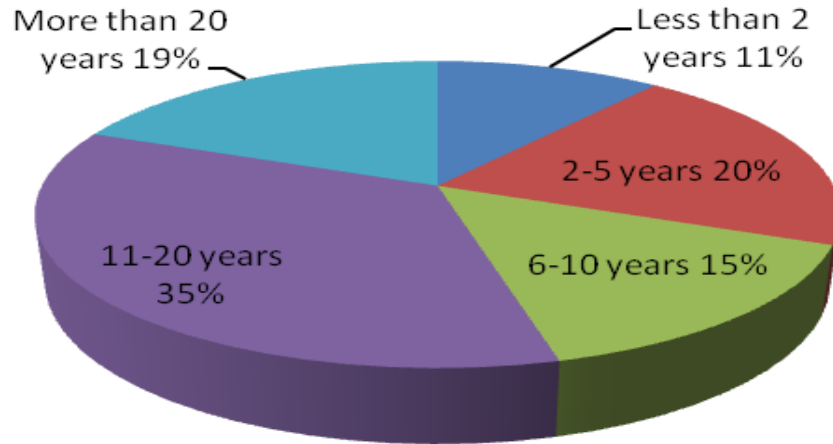


Figure 2. Length of business operation in the sample.

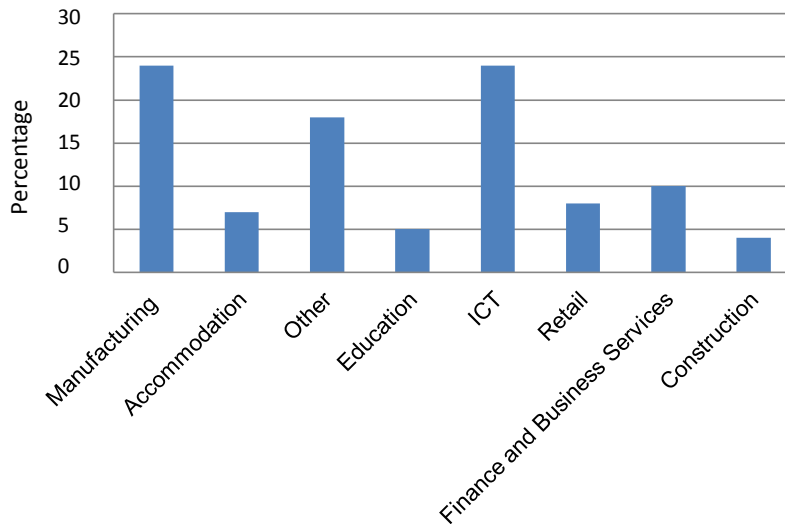


Figure 3. Type of industry.

Type of industry

If one combines SMEs from the ICT and manufacturing sectors, they make up 48% of the respondents as shown in Figure 3. The fact that 24% of respondents were from the ICT sector was to be expected, as were the 24% from the manufacturing sector. This is in line with the observation by Kotelnikov (2007), that manufacturing firms are more likely to have more capabilities than other sectors. Financial and business services, retail, accommodation, education and construction sectors were 10, 8, 7, 5 and 4% respectively. The ‘Other’ sector includes non-profit organisations, advertising, religions, government, publishing, healthcare, textile, promotional printing, organisation development, consulting, forensic services, online marketing, transportation, Restaurants,

and community building.

Characteristics of responses

It can be deduced from Table 1 that product innovativeness was split into Product-Innov1 and Product-Innov2 for testing purposes and to check for consistency of the respondents. The same applies to behavioural innovativeness, sensing, adaptive, innovative and integrative capability constructs. It was considered necessary to know the characteristics (normality) of the responses (Cavana et al., 2001). All the constructs were measured on the Likert scale of 1 to 5. Table 1 further shows that all the constructs, except constructs measuring process innovativeness (Process-Innov), had a mean above

Table 1. Descriptive statistics of responses.

Variable	Constructs	Definition	Mean	Std. dev.
Competitive advantage	Process-Innov	Change business processes	2.486842	1.026235
	Market-Innov	Introduce new marketing concept	3.413333	1.128181
	Strategic-Innov	Introduce a new business strategy	3.105263	1.040243
	Product-Innov1	Market new products / services	3.565789	1.158568
	Product-Innov2	Introduce innovative products / service	3.684211	1.073443
	Behavioural-Innov1	Encourage people to challenge old traditions / practices	4.106667	0.909014
	Behavioural-Innov2	Encourage individual / team / management's willingness to new ways of doing business	4.223684	0.842198
DCs	Sensing-Cap1	Cognisant / aware of market change ahead of rivals	4.184211	0.904957
	Sensing-Cap2	Use market information to improve business performance	4.236842	0.892464
	Absorptive-Cap	Use external information to transform business processes	4.184211	0.933960
	Adaptive-Cap1	Respond quickly to changes in customers need and changes in business environments	4.289474	0.780013
	Adaptive-Cap2	Adapt quickly to shifts in our business goals / strategies	4.106667	0.952569
	Innovative-Cap1	Willing to try new and innovative ways of doing business	4.266667	0.859499
	Innovative-Cap2	Introduce new products / services which are at the cutting edge of technology	4.053333	1.064073
	Networking-Cap	Partner with other organisation(s)	4.135135	1.150632
	Integrative-Cap1	Willing to take technology related risks	4.157895	0.909984
	Integrative-Cap2	Embrace new technologies easily	4.146667	0.910796
	Integrative-Cap3	Successfully combine newly acquired knowledge with existing knowledge	4.360000	0.746885
	Integrative-Cap4	Combine external resources / knowledge with internal resources / knowledge to meet the goals and objectives of the firm	4.213333	0.793442
Integrative-Cap5	Manage both internal and external changes	4.253333	0.839777	

average (mean > 3). This indicates that respondents in general agreed with the questions that the constructs measured. The findings clearly indicate that the responses were not normally distributed, but the values of standard deviation (Std. dev.) show that the respondents were distributed around the mean.

Testing the relationships of constructs

It is important to know the collinearity (relation-

ship) between independent constructs, as well as conducting both reliability and validity tests for all the constructs (Cavana et al., 2001). Collinearity (sometimes called multi-collinearity) exists when "there are strong linear relationships among independent variables" (Allison, 1999; Kleinbaum et al., 2008: 305). The reliability and validity tests measure the goodness of the constructs: reliability tests measure the extent to which the measure (construct) is error free, while validity tests ensure the ability of the constructs to measure the intended concept (Cavana et al.,

2001). The correlation of independent constructs, reliability and validity tests of the independent and dependent constructs are therefore presented.

Correlation of DCs

To measure the strength of the relationship between DC constructs (there is no need to find the correlation between the competitive advantage constructs, because multi-collinearity does not affect the dependent variable (Allison, 1999)], a Spearman rank order correlation was conducted.

Table 2. Spearman rank order correlations of DC constructs.

Constructs	Sensing-Cap1	Sensing-Cap2	Absorptive-Cap	Adaptive-Cap1	Adaptive-Cap2	Innovative-Cap1	Innovative-Cap2	Networking-Cap	Integrative-Cap1	Integrative-Cap2	Integrative-Cap3	Integrative-Cap4	Integrative-Cap5
Integrative-Cap5													1.0000
Integrative-Cap4												1.0000	0.5865**
Integrative-Cap3											1.0000	0.6202**	0.5147**
Integrative-Cap2										1.0000	0.4485**	0.4214**	0.3971**
Integrative-Cap1									1.0000	0.5359**	0.4989**	0.5752**	0.5347**
Networking-Cap								1.0000	0.3520**	0.2547*	0.1830	0.4348**	0.2801*
Innovative-Cap2							1.0000	0.1281	0.4867**	0.4097**	0.3061**	0.3046**	0.3724**
Innovative-Cap1						1.0000	0.4180**	0.4099**	0.6163**	0.5748**	0.6339**	0.6347**	0.4751**
Adaptive-Cap2					1.0000	0.6069**	0.3679**	0.3702**	0.5098**	0.5125**	0.6369**	0.5723**	0.4903**
Adaptive-Cap1				1.0000	0.7140**	0.5571**	0.2963**	0.3835**	0.4912**	0.3852**	0.5453**	0.6465**	0.3966**
Absorptive-Cap			1.0000	0.2396*	0.4550**	0.4174**	0.2085	0.2803*	0.4589**	0.2575*	0.4275**	0.3557**	0.3252**
Sensing-Cap2		1.0000	0.3198**	0.4402**	0.3558**	0.4549**	0.2186	0.1173	0.2944**	0.4166**	0.4697**	0.4367**	0.3258**
Sensing-Cap1	1.0000	0.5445**	0.3083**	0.2187	0.2878*	0.2854*	0.0772	0.1560	0.2761*	0.3291**	0.4335**	0.3497**	0.3780**

Spearman rank order correlations (SA Data) MD pairwise deleted marked correlations are significant at *p <0.0500, **p <0.0100.

Since DC constructs were measured on an ordinal scale, a Spearman rank order correlation was considered appropriate to evaluate the strength of the relationship between the constructs (Cavana et al., 2001). Table 2, shows that most of the constructs are significant at p < 0.01 and only correlation between Adaptive-Cap1 and Adaptive-Cap2 exceeded 0.7. High correlation was handled by removing Adaptive-Cap2 from subsequent analysis.

Reliability of constructs

The reliability test in Table 3 indicates that all the constructs had Cronbach alpha (α) coefficients above 0.90. It can be concluded that the measuring instrument is reliable and the internal consistency reliability of the constructs is good (Cavana et al., 2001).

Validity test of constructs

Factor analysis was used to determine construct validity. Since this study is exploratory in a nature, loading cut off was set to 0.4. Table 4 shows that the respondents were clear about the questions and all the constructs loaded cleanly. By using Varimax normalized, each of the constructs loaded to only one of the two factors without having cross loading. It was discovered that both factors have at least five constructs; hence the factors are considered stable (Costello and Osborne, 2005).

However, the statistical analysis indicated Behavioural-Innov1 and Behavioural-Innov2 constructs, that were predicted to be competitive advantage constructs, are actually DCs constructs. This might be due to the way the questions were worded. Therefore, Behavioural-

Innov1 and Behavioural-Innov2 were grouped as part of DCs constructs in subsequent analysis. Table 5 shows that the two factors explained above 51% of the variance in the data.

Forward stepwise analysis in multiple regression

Investigating the impacts of DCs on competitive advantage, calls for use of a multiple regression analysis. A multiple regression analysis was considered appropriate because, a multiple regression analysis is good for making predictions, and it is designed to make prediction error as small as possible (Allison, 1999). A multiple regression analysis can be used to describe the direction, examine the effects, strength and extent of the relationship between

Table 3. Reliability test of constructs.

Variable name	Constructs	Mean if – deleted	Var. if – deleted	StDv. if – deleted	Itm-Totl - Correl.	Alpha if – deleted
Competitive advantage	Process-Innov	72.62500	116.6788	10.80180	0.425765	0.909377
	Market-Innov	71.65278	109.8378	10.48035	0.677158	0.902181
	Strategic-Innov	71.97222	113.4159	10.64969	0.573837	0.905237
	Product-Innov1	71.51389	113.6942	10.66275	0.500555	0.907753
	Product-Innov2	71.40278	112.5183	10.60747	0.596756	0.904606
	Behavioural-Innov1	70.98611	114.6804	10.70889	0.602350	0.904521
	Behavioural-Innov2	70.84722	114.0183	10.67794	0.686242	0.902679
DCs	Sensing-Cap1	70.90278	118.4211	10.88215	0.403633	0.909437
	Sensing-Cap2	70.83334	116.7222	10.80381	0.507806	0.906865
	Absorptive-Cap	70.88889	117.5710	10.84302	0.428535	0.908935
	Adaptive-Cap1	70.77778	115.5062	10.74738	0.656559	0.903709
	Innovative-Cap1	70.81944	112.5368	10.60834	0.764200	0.900754
	Innovative-Cap2	71.04166	114.4010	10.69584	0.513032	0.907044
	Networking-Cap	70.95834	118.5122	10.88633	0.297822	0.913922
	Integrative-Cap1	70.91666	112.4931	10.60627	0.722979	0.901479
	Integrative-Cap2	70.94444	114.4691	10.69903	0.612006	0.904274
	Integrative-Cap3	70.70834	116.1233	10.77605	0.654941	0.903976
	Integrative-Cap4	70.86111	114.3974	10.69567	0.714989	0.902356
	Integrative-Cap5	70.84722	116.1017	10.77505	0.579917	0.905228

Summary for scale: Mean=75.0833 Std.Dv.=11.3631 Valid N:72 (SA Data) Cronbach alpha: 0.910062 Standardized alpha: 0.915769; Average inter-item corr.: 0.375191.

independent variables and a dependent variable while keeping other independent variables constant (Allison, 1999; Kleinbaum et al., 2008).

A multiple regression analysis can be a forward entry, a backward removal, a forward stepwise, a backward stepwise, or a best subsets regression analysis which can be used to examine whether an independent variable really affects the dependent variable (Allison, 1999). A forward entry follows a forward entry procedure and a backward removal follows a backward elimination procedure (Kleinbaum et al., 2008). While a stepwise regression analysis (forward and backward stepwise regression) combines forward and backward procedures, it permits re-examination at every step (Kleinbaum et al., 2008). A forward stepwise regression analysis usually gives the same result as a backward stepwise regression analysis. Stepwise regression analysis was designed to identify good subset models for all possible regressions, it chooses the variables by adding one variable at a time to the previously chosen variable(s) (Rawlings et al., 2001).

A forward stepwise regression analysis was considered appropriate to investigate the impacts of DCs on competitive advantage (the result is presented in Table 6). The analysis shows that all the competitive advantage constructs are highly significant at $p < 0.05$. The independent variable (DC constructs) explained approximately

11% variance in Process-Innov ($p < 0.0207$), 33% variance in Market-Innov ($p < 0.0001$), 19% variance in Strategic-Innov ($p < 0.0008$), 10% variance in Product-Innov1 ($p < 0.0226$) and 23% variance in Product-Innov2 ($p < 0.0002$). For example, Process-Innov had F value of 4.10894 which is significant at $p < 0.0207$. This result shows that 0.326228 (Multiple R) is the multiple correlation among the independent variables and the dependent variable (Process-Innov), and approximately 11% (multiple $R^2 = 0.106425$) of the variance have been explained by the independent variable. In the column degree of freedom ($df = 2$) – Model, the number represents the number of independent variables that contributed to the dependent variable (Process-Innov), it should be noted that stepwise regression uses the concept of partial correlation of variables, because often the independent variables are correlated, so that once one of the variables has entered the equation, the remaining have nothing extra to add (Rawlings et al., 2001).

DISCUSSION

The literature on dynamic capabilities largely consists of conceptual and theoretical studies, rather than empirical studies. A very little work has been undertaken to identify

Table 4. Validity test of constructs: Factor analysis of constructs.

Variable name	Constructs	Factor – 1	Factor – 2
Competitive advantage	Process-Innov	0.122539	0.662110
	Market-Innov	0.325583	0.804969
	Strategic-Innov	0.249845	0.726874
	Product-Innov1	0.086868	0.839528
	Product-Innov2	0.237087	0.778205
	Behavioural-Innov1	0.599679	0.284747
	Behavioural-Innov2	0.719600	0.267585
DCs	Sensing-Cap1	0.508929	0.066000
	Sensing-Cap2	0.573716	0.168903
	Absorptive-Cap	0.502531	0.098823
	Adaptive-Cap1	0.677431	0.292218
	Innovative-Cap1	0.766176	0.338509
	Innovative-Cap2	0.507864	0.273800
	Networking-Cap	0.402368	0.030148
	Integrative-Cap1	0.720154	0.312536
	Integrative-Cap2	0.678666	0.200543
	Integrative-Cap3	0.727981	0.210396
	Integrative-Cap4	0.749864	0.276560
Integrative-Cap5	0.769861	0.030199	
Expl.var		5.864123	6.095246
Prp.totl		0.254962	0.320802

Factor loadings (Varimax normalized) (SA Data). Extraction: Principal components (Marked loadings are >.400000).

Table 5. Variance explained by 2 factors.

Factor	Eigenvalue	Total variance (%)	Cumulative eigenvalue	Cumulative %
1	7.819315	41.15429	7.819315	41.15429
2	1.931803	10.16738	9.751117	51.32167

Eigenvalues (SA Data) Extraction: Principal components.

Table 6. Forward stepwise analysis in multiple regression.

Variable	Process-Innov	Market-Innov	Strategic-Innov	Product-Innov1	Product-Innov2
p	0.020608	0.000001	0.000706	0.022577	0.000121
F	4.10894	16.64363	8.07576	4.00695	10.30581
MS - Residual	1.008510	0.915586	0.929063	1.242020	0.933504
df - Residual	69	69	69	69	69
SS - Residual	69.58718	63.17544	64.10534	85.69936	64.41175
MS - Model	4.14391	15.23867	7.50288	4.97671	9.62051
df - Model	2	2	2	2	2
SS - Model	8.28782	30.47734	15.00577	9.95342	19.24103
Adjusted - R ²	0.080524	0.305876	0.166192	0.078089	0.207692
Multiple - R ²	0.106425	0.325429	0.189680	0.104058	0.230011
Multiple - R	0.326228	0.570464	0.435522	0.322580	0.479594

Test of SS whole model vs. SS residual (SA Data).

the types of dynamic capabilities that can lead to competitive advantage within the SMEs from the developing countries contexts. Through an online based survey of South African SMEs, our paper provides empirical evidence that shows the types of organisational capabilities or dynamic capabilities that can assist SMEs to achieve competitive advantage. Our paper clarifies the notion that dynamic capability alone can lead to competitive advantage.

From constructs validity tests in Table 4, this result indicates that sensing and integrative capabilities and behavioural innovativeness are part of DCs constructs. This study extends DC literature to include sensing and integrative capabilities and behavioural innovativeness. This findings confirms the literature (Jusoh and Parnell, 2008; Lindblom et al., 2008; Morgan et al., 2009; Parida, 2008; Wang and Ahmed, 2007), and disproves Ambrosini and Bowman's (2009) argument.

Sensing capability can enable SMEs to capitalise on new opportunities and to respond quickly to customers' needs and the business environments, ahead of rivals. SMEs with sensing capability will be able to demonstrate anticipatory skills and predict customers' response to change ahead of rivals.

Integrative capability can assist SMEs to adequately put into use all its resources to generate long-time returns in changing environments. SMEs with integrative capability will be able to use past experiences, resources and capabilities to manage both internal and external changes, ahead of competitors.

Behavioural innovativeness (now referred to as behavioural capability) is the ability of SMEs to embrace a culture that motivates the introduction of new concepts, new processes and new strategies and that can be sustained over time to achieve competitive advantage. Behavioural capability is the ability to motivate individuals, teams and management to new ways of doing things in a changing business environment.

It can also be deduced from Table 6 that DCs have significant roles to play in achieving competitive advantage. Therefore, DCs are capable of influencing a firm's VRIN resources to achieve competitive advantage in a fast changing business environment (Ambrosini and Bowman, 2009). The empirical findings largely indicate that DCs have significant impacts on competitive advantage, and that SMEs need to go beyond the level of acquiring resources and move to the level of transforming the resources to capabilities, in order to remain competitive in a changing environment.

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