

Effectuation and Causation as Decision-making Strategies by Nascent Entrepreneurs in South Africa

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ABSTRACT

The study aimed to evaluate the influence of causation and effectuation decision-making strategies on the performance of nascent entrepreneurship ventures in South Africa. The study utilised a cross-sectional, quantitative approach. The empirical study was composed of 75 independent samples that were obtained from nascent entrepreneurs in South Africa.

The main findings of the study suggest an association between effectuation and venture performance. Evidence was also found to suggest a positive association between the effectuation sub-dimensions of affordable loss, pre-commitment and experimentation. There was, however, no association found between flexibility and venture performance. Contrary to the stated hypothesis, a positive relationship was found between causation and venture performance. Overall the study finds evidence to support the view that entrepreneurs employed both effectuation and causation logics with a certain level of success for the venture. The findings of the study indicate that venture performance was not necessarily influenced by the decision to utilise effectual or causal decision-making strategies. However, effectual decision-making strategies had a greater influence on venture performance when compared to causal decision-making strategies.

The findings of the study provide evidence in support of the theoretical arguments put forward by Sarasvathy (2001), that effectuation has a positive impact on the performance of a new venture. The implication for entrepreneurs is that effectuation provides a different method that entrepreneurs can utilise in the formation of new ventures. Should entrepreneurs determine that the environment in which they are operating or the opportunities they are pursuing are characterised by high levels of uncertainty, effectuation is a possible alternative to causation. This research makes a contribution to the discourse about the suitability of effectuation as a decision-making logic that entrepreneurs can apply in emerging economies.

Key words: Decision-making Process; Effectuation; Causation; Venture Performance; Nascent Entrepreneurship

DECLARATION

I, **Wandile Malinga**, declare that this research report is my own work except as indicated in the references and acknowledgements. It is submitted in partial fulfilment of the requirements for the degree of Master of Management in the Field of Entrepreneurship at the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in this or any other university.



.....
Wandile Marvin Malinga

Signed at WBS

On the 31 day of MAY 2018.

DEDICATION

I dedicate this research report to my grandparents, Evelyn and Raphael Dlamini who instilled in us through example and teachings the importance of self-development, education and always taking pride in oneself *“Ngiyabonga bo Mandela”*.

To my grandfather, you remain my role model and the barometer by which I measure my development and success as a man. Thank you for the lessons on the many drives to Dundee and Wasbank, those fading memories remain dear to me.

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Mbali, I can truly say that this would not have been possible without your constant guidance, selfless support and grace. Thank you for always supporting my dreams and impulses. I am grateful to and for you.

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CHAPTER 1 : INTRODUCTION TO STUDY

1.1 INTRODUCTION

The creation, development and long-term sustainability of Small, Medium and Micro Enterprises (SMMEs) are fundamental to address and resolve socio-economic challenges that persist in developing countries and economies such as South Africa. In South Africa, this has been clearly acknowledged through the National Development Plan (NDP). The NDP views the establishment of sustainable SMMEs as a central to the achievement of key objectives that will undoubtedly promote and contribute to socio-economic change (National Planning Commission, 2011).

These objectives include the reduction of unemployment to 6% by 2030 (unemployment was measured at a fourteen-year high of 27.7% recorded in Quarter 2: 2017). This will be achieved primarily through the stimulation and development of SMMEs. The NDP predicts that SMMEs will contribute 90% of all new jobs created in this country by 2030 and that the progressive growth of the economy will in part be from the contribution of sustainable SMMEs (National Planning Commission, 2011; Statistics South Africa, 2017; South African Institute of Chartered Accountants [SAICA], 2016).

It is, however, imperative to state that when pursuing the demanding task of new venture creation and development, developing economy entrepreneurs are faced with unique problems and sometimes seemingly insurmountable challenges. This is evident as developing economies, such as South Africa, are characterised by uniquely high business failure rates (SAICA, 2016; Corrigan, Darroll & Rankin, 2013). These challenges include:

- A lack of capital for nascent entrepreneurs to establish and develop their businesses, which is further exacerbated by the difficulty in obtaining financial aid from private and public institutions (SAICA, 2016)
- Inadequately skilled entrepreneurs who require development in business management and other competencies that are paramount to the successful creation and development of new ventures (SAICA, 2016)

- Structures to support nascent entrepreneurs remain largely ineffective (SAICA, 2016)
- Nascent entrepreneurs need to overcome significant barriers to entry in the markets in which they aspire to operate (SAICA, 2016)

(SAICA, 2016).

The uniqueness and gravitas of these challenges necessitate consideration of the manner in which developing economy entrepreneurs approach the overall process of entrepreneurship. This includes the identification of opportunities, the creation of new ventures and the decision-making strategies that support these processes (Alvarez & Barney, 2005; Chandler, DeTienne, McKelvie, & Mumford, 2011; Reymen, Andries, Berends, Mauer, Stephan, & Burg, 2015; Sarasvathy, 2001; Shane & Venkataraman, 2000).

It is, therefore, of fundamental importance that through sustained empirical research we continue to develop, interrogate and reconsider our understanding of the manner in which entrepreneurs behave, the methods and cognitive processes and heuristics that entrepreneurs utilise to facilitate decision-making under conditions of uncertainty and the actions that entrepreneurs choose to take under various circumstances (Alvarez & Barney, 2005; Reymen et al., 2015; Sarasvathy, 2001). This continued reconsideration necessitates the examination of emerging theoretical perspectives and methods that challenge traditional perspectives and models of entrepreneurship. It requires that researchers interrogate and determine the suitability and usability of these emerging theories in various environments, contexts and geographies.

The ultimate goal of this exhaustive process is the practical application and utilisation of theories that are deemed effective and which bring with them the promise of reshaping the entrepreneurial process and enhancing the possibility of developing a higher rate of sustainable entrepreneurial ventures (Chandler et al., 2011; Fisher, 2012; Perry, Chandler & Markova, 2012; Read, Song & Smit, 2009; Reuber, Fischer, & Coviello, 2016; Salamon, 2016; Sarasvathy, 2001; Urban & Heydenrych, 2015).

In ground-breaking research, Sarasvathy (2001) introduced a decision-making strategy that leverages effectuation processes, rather than the traditional and well-established processes of causation that are utilised in the creation of new ventures.

The effectuation model proposes an alternative to the entrepreneurial process and more importantly, challenges many aspects of the causation model. A critical example of such a challenge lies in the treatment of opportunity: causation logic contends that opportunities exist and the onus lies with the entrepreneurs to identify and exploit them, while effectuation logic affirms that opportunities are not in abundance and therefore must be created by entrepreneurs (Roach, Ryman & Makani, 2016; Sarasvathy, 2001).

In proposing this paradigm shift, Sarasvathy (2001) notes that effectuation is not meant to displace causation and underpins the importance of both logics as tools available to an entrepreneur to use, depending on the context and the actions that are required to be taken by the entrepreneur. This, then, allows for agility in the application of the alternative logics, with the possibility of applying both logics simultaneously or a different logic at a different phase of the venture as the context and profile of the venture changes (Alvarez & Barney, 2005; Sarasvathy, 2001; Sarasvathy, 2009).

Central to the introduction of this alternative approach to new venture creation is the belief that entrepreneurs must utilise decision-making approaches and strategies that are suitable for their environment and circumstances, with a specific focus on the level of risk and uncertainty within that environment (Sarasvathy, 2001; Sarasvathy, 2009). Sarasvathy (2001) argues that in highly uncertainty environments and when the future cannot be reasonably forecast, effectuation decision-making strategies are superior. Alternatively, causation decision-making strategies are a better fit in environments or circumstances where risk is present, but the entrepreneur can use mechanisms on hand to estimate the distribution of the risk and to forecast the future (Sarasvathy, 2001; Sarasvathy, 2009).

This empirical research study aims to assess the relationship between the use of traditional causation decision-making strategies and emerging effectual decision-making strategies, in the performance of nascent entrepreneurship ventures in South Africa.

1.2 THEORETICAL BACKGROUND TO STUDY

The study has theoretical roots in three domains; namely, effectuation, causation and venture performance. The study aims to evaluate the influence of causation and effectuation decision-making strategies on the performance of nascent entrepreneurship ventures in South Africa.

1.2.1 Causation: A logic of prediction

Traditionally, a structured and defined process has been followed by entrepreneurs in the creation of new ventures. This process of new venture creation was referred to by Sarasvathy (2001) as the causation approach (Sarasvathy, 2001; Sarasvathy, 2009).

Causation relies on predictive strategies and aligns itself with a school of thought that believes that opportunities exist within the environment but require alert entrepreneurs to identify and eventually exploit them (Fisher, 2012; Read et al., 2009; Sarasvathy, 2001; Sarasvathy, 2009; Urban & Heydenrych, 2015). When employing this approach, the entrepreneur identifies a specific outcome and subsequently engages in a systematic process of identifying suitable opportunities in existing and mature markets (Chandler, DeTienne, & Mumford, 2007). The entrepreneur then embarks on a process of collecting resources that will be required to achieve this preconceived outcome. This process is supported by detailed planning and analysis through the use of predictive instruments that allow the entrepreneur to obtain as much information about the unknown future and thus to control it. The ultimate goal of this systematic process is for the entrepreneur to acquire a competitive advantage (Chandler et al., 2011; Fisher, 2012; Sarasvathy, 2001).

Fundamental to this approach is rigorous planning and analysis of information that facilitates rational decision-making by an entrepreneur and culminates in the selection of an opportunity with the highest expected rate of return (Chandler et al., 2011; Fisher, 2012; Perry et al., 2012; Sarasvathy, 2001; Sarasvathy, 2009). Sarasvathy (2009) simplistically describes this approach as the jigsaw puzzle approach, meaning that as with a jigsaw puzzle the final picture exists, but the entrepreneur is tasked with bringing the various elements together to complete the picture (Chandler et al., 2011; Sarasvathy, 2001).

1.2.2 Effectuation: A logic of control

Sarasvathy (2001) proposed an alternative path and approach to new venture creation; namely, the effectuation approach. Termed the logic of expert entrepreneurs. Effectuation was designed to provide entrepreneurs with heuristics that are intended for use in conditions of uncertainty – an environment in which many entrepreneurs operate – and therefore should have a positive influence on new venture performance (Read et al., 2009). Effectuation relies on non-predictive strategies and aligns itself with the school of thought that believes that entrepreneurial opportunities are created by entrepreneurs (Fisher, 2012; Read et al., 2009; Urban & Heydenrych, 2015; Sarasvathy, 2001; Sarasvathy, 2009). This approach represents a paradigm shift in our understanding of the entrepreneurship process. It asserts that new venture creation is a process driven by four sub-dimensions and principles of effectuation which guide the behaviour of effectuators (entrepreneurs who utilise effectuation logic), namely; experimentation, affordable loss, pre-commitments and flexibility (Fisher, 2012; Read et al., 2009; Sarasvathy, 2001; Sarasvathy, 2009; Urban & Heydenrych, 2015).

The approach positions effectuation as an outward-looking process whereby an entrepreneur takes an inventory of the resources and assets at their disposal, including their knowledge, expertise, competences, skillset and social capital. Based on those resources, the entrepreneur determines the most suitable outcome or objective to pursue. There is no preconceived idea of the ultimate profile of the new venture to be created; however, there is agility and responsiveness to information derived from experimentation and approaches in the market. The feedback from the market drives the decision about which opportunity to pursue, the business model to follow and the ultimate profile of the new venture (Chandler et al., 2011; Read et al., 2009; Sarasvathy, 2001; Sarasvathy, 2009).

Sarasvathy (2009) described this approach as a “patchwork quilt” approach, meaning that like a patchwork quilter, the entrepreneur assembles resources that are already at their disposal and continually experiments with these resources until a feasible opportunity develops (Chandler et al., 2011; Sarasvathy, 2001; Sarasvathy, 2009).

1.2.3 Venture performance

Organisational performance is a key dependent variable in management research. The primary reason for the importance of this construct is that it is central to the measurement of the survival and failure of ventures. Richard, Devinney, Yip and Johnson (2009) maintain that:

“Measuring it is essential in allowing researchers and managers to evaluate the specific actions of firms and managers, where firms stand vis-à-vis their rivals, and how firms evolve and perform over time. Its importance as the ultimate evaluative criterion is reflected in its pervasive use as a dependent variable” (p. 719).

The study focuses exclusively on nascent entrepreneurs, and this imposed a limitation on the accessibility and availability of widely accepted objective measures of financial performance (Richard et al., 2009). The study will, therefore, use employment growth, which is a subjective self-reported measure, when assessing venture performance.

This approach was considered to be accurate in measuring venture performance, as previous studies have indicated that the manager’s opinion on the current performance of the venture was indicative and consistent with the actual performance of the venture when compared to objective measures of performance (Urban & Heydenrych, 2015).

1.3 CONTEXT OF THE STUDY

The Global Entrepreneurship Monitor (GEM) South Africa (Report 2016/2017), which is compiled yearly and provides an analysis of global and country-specific levels of entrepreneurship and other key indicators, noted with great concern the chronically low levels of entrepreneurial intention and activity among South Africans (Herrington, Kew & Mwanga, 2017). The report notes a persistent trend of deterioration and decline of entrepreneurial intentions, activity and new business ownership (Herrington et al., 2017).

In 2016, the percentage of South Africans engaged in nascent entrepreneurial activity was recorded as 3.9%, while the average for the same measure in the African continent was recorded as 10.5%. A similar trend was noted in the measurement of

Total Entrepreneurship Activity, where the overall percentage of South Africans who were engaged in nascent entrepreneurship or owner-managed new businesses was noted at 6.9%, while the average for the same metric in the African continent was noted at 17.6% (Herrington et al., 2017). Combine the low levels of entrepreneurial intention and participation with the high levels of business mortality as noted in 2013 by Minister of Trade and Industry, Rob Davies, who declared the following:

“... (of) seven small businesses started in South Africa, in one year only two of them will continue to be in existence. In other words, five of them will be out of business within a year” (Corrigan et al., 2013, p. 3).

South Africa finds itself in the middle of a perfect storm. There has been limited progress in addressing the high levels of unemployment. The country's population sits at approximately 57 million people (Statistics South Africa, 2017). The Quarterly Labour Force Survey (Quarter 2: 2017) Report estimates that the unemployment ratio was 27.7%, and the employment/population ratio (absorption rate) was 43.3%, meaning that only 43.3 % of the total working-age population (15–64) are currently employed or – rather more alarmingly – 64.7% of the total working age population remain unemployed. Statistics South Africa further reveals that approximately 31.1% of youth between the ages of 15–24 were not employed, in school or being trained (Statistics South Africa, 2016). A deepening inequality persists within the country and growth continues to stagnate (National Planning Commission, 2011).

Therefore, in the context of these significant socio-economic challenges, the importance of entrepreneurship as a key driver to the growth of the South African economy cannot be overemphasised. The Entrepreneurial Ecosystem of South Africa: A Strategy for Global Leadership (2017) Report identifies the need for South Africa to produce entrepreneurs who are innovative and who create new ventures that are primed for domestic and international growth (Global Entrepreneurship and Development Institute, 2017).

In the study of the South African entrepreneurial ecosystem, existing bottlenecks that were prohibiting the achievement of growth-oriented entrepreneurial ventures in South Africa were defined. One of the key obstacles to entrepreneurial growth was identified as a lack of knowledge and skills among entrepreneurs, which manifested in the

inability of and failure by entrepreneurs to assess market potential and to plan adequately for market entry and expansion (Global Entrepreneurship and Development Institute, 2017).

This finding is indicative of a need for the interrogation of the suitability of the decision-making processes and strategies that are adopted by entrepreneurs in the process of opportunity recognition, development, evaluation and execution (Ardichvili, Cardozo & Ray, 2003). The ability of an entrepreneur to identify and pursue the right opportunities for their business and their environment is fundamental to the success of any entrepreneurial venture (Stevenson, Roberts & Grousbeck, 1985 as cited in Ardichvili et al., 2003). One of the key drivers and competencies that could impact the ultimate performance of an entrepreneurial venture is the decision-making strategy adopted by an entrepreneur, as this influences the behaviour and action taken by an entrepreneur, which may ultimately shape the outcome, whether successful or unsuccessful, of the business venture (Perry et al., 2012; Sarasvathy, 2001; Salamon, 2016).

The development of successful and sustainable entrepreneurial ventures has been identified as a key driver in the stimulation and growth of developing market economies (National Planning Commission, 2011). The impact of successful and sustainable ventures in society is far-reaching and includes the creation of employment opportunities within the economy, the reduction of poverty and the development of an entrepreneurial culture within the country. It is, therefore, of fundamental importance that emerging theories and methods that challenge traditional processes are interrogated to determine their suitability and usability in various environments. These theories should thereafter be applied in practice if they are expected to enhance the possibility of developing a higher rate of sustainable entrepreneurial ventures (Chandler et al., 2007; Perry et al., 2012; Read et al., 2009; Reuber et al., 2016)

The following sections of this chapter will outline the significance of the study, state the problem statement, clearly define the terms and constructs applicable and outline the assumptions made as a part of the study.

1.4 CONTRIBUTION OF THE STUDY

The study aims to contribute to the advancement of entrepreneurship research by evaluating the influence of causation and effectuation decision-making strategies on the performance of nascent entrepreneurship ventures in South Africa.

Sarasvathy (2001), in her seminal work, concluded that effectuation is not meant to displace causation and underpins the importance of both logics as tools available for an entrepreneur to adopt. She places the onus on future researchers to conduct empirical research geared to ascertain the contexts and circumstances where causation or effectuation provide an entrepreneur with the best opportunity for creating and developing a sustainable venture. This research study aims to contribute to the debate and resolution of this question by assessing the suitability of each approach in the context of a resource-constrained and developing market such as South Africa.

The research study furthermore aimed to make a contribution in addressing a gap in the literature that was identified by Perry et al. (2012) who made the following comments:

- Moderate to slow progress in the development of effectuation research and determined that effectuation research is still very much in its infancy. This view was also supported by Read et al. (2009) who note the theoretical maturity of effectuation research but lamented the lack of empirical measurement of the construct.
- A lack of empirical testing of effectuation and encouraged researchers to conduct effectuation research.
- The importance of continued empirical research into effectuation because it proposes an alternative method, process and strategy that entrepreneurs can follow in instances and situations where traditional methods, such as the causation strategy are not suitable.
- A need to assess and explore the relationship between effectuation and established constructs. This assessment is supported by Urban and Heydenrych (2015) and Read et al. (2009), who through their work into effectuation identified a

deficiency in quantitative research that assesses the relationship between effectuation and other constructs such as performance.

The study aims to leverage off the work conducted by Chandler et al. (2011), who contributed to the advancement of research into causation and effectuation by developing validated measures for the two constructs with the aim of promoting future empirical research. The research study aims to:

- Leverage off these validated measures and attempt to answer the appeal made by Chandler et al. (2011) by contributing to literature through using their measures in the examination of the entrepreneurial process.
- Contribute to the literature in this field by using these measures in a different context, that of a resource-constrained and developing country such as South Africa.
- Contribute to entrepreneurship literature, as research studies where causation and effectuation are tested remain scarce. The promotion of such research is integral to the development of our understanding.

(Chandler et al., 2011; Perry et al., 2012).

Perry et al. (2012) outline the importance of interrogating the universal applicability of the predominantly used and taught causation-based model of entrepreneurship and the consideration of competing models such as the effectuation-based model. This research study aims to contribute to this requirement by assessing the applicability and the suitability of these decision-making strategies in a resource-constrained and developing country (South Africa). Similar studies have been conducted, notably:

- Sarasvathy (2001) conducted an assessment of 27 business founders, who through predefined criteria were considered to be expert entrepreneurs. These expert entrepreneurs were asked to verbally describe the process that they would follow in identifying an existing market or creating a new market for a new product.
- Read et al. (2009) contributed to effectuation literature by conducting a meta-analysis of prominent research studies conducted on the subject of effectuation. The authors attempted to determine the multi-dimensional variables relationship with the performance of new ventures.

- Rust (2011) conducted a research study focusing on nascent entrepreneurship ventures in the United States of America that was isolated to those operating within dynamic industries. The objective of the research was to ascertain whether the decision by entrepreneurs to utilise causation or effectuation decision-making processes influenced the survival of ventures within a dynamic industry.
- Urban and Heydenrych (2015) assessed the relationship between effectuation logic, technological orientation and venture performance. This study was, however, limited to the renewable energy sector in South Africa.
- Chidakwa (2016) utilised causation and effectual decision-making models to assess the entrepreneurial processes of high-growth ventures in Zimbabwe.
- Salamon (2016) assessed the extent to which the application of causal or effectual decision-making strategies by German entrepreneurs at business start-up phase influences the ultimate success of the venture.

Studies conducted on this topic have produced differing conclusions:

- Sarasvathy (2001), in an assessment of 27 expert entrepreneurs determined that 63% of the sampled entrepreneurs used effectual reasoning 75% of the time in the manner in which they absorbed information and made decisions.
- Read et al. (2009) concluded that there is indeed evidence of a positive relationship between an effectual approach to strategy making and new venture performance. However, they could not conclude on the relationship of affordable loss, which is a sub-dimension of effectuation, and venture performance.
- Rust (2011) determined that there are no purely causal or effectual ventures as entrepreneurs tend to use a blend of the two logics. He concluded that neither approach is a definite predictor of sustained venture performance; however, he further concluded that the causation approach improves the probability of sustained venture performance by 10% (23%–33%) when compared to the effectual approach.
- Urban and Heydenrych (2015) established that only three dimensions of effectuation (pre-commitment, experimentation and flexibility) had a significant positive impact on performance.
- Chidakwa (2016) concluded that the characteristics and principles of effectuation decision-making are utilised by high-growth ventures in emerging markets.

- Salamon (2016) could not conclusively determine whether the use of causation or effectuation provided an entrepreneur with an advantage in the process of creating a successful venture.

1.5 PROBLEM STATEMENT

Entrepreneurial decision-making has been identified as a fundamental contributor to the success of entrepreneurial ventures in conditions of uncertainty (Chandler et al., 2011; Perry et al., 2012; Sarasvathy, 2001; Sarasvathy, 2009). This research study was conducted in the developing economy of South Africa, where the failure rate for new ventures is extraordinarily high and therefore, exhibits characteristics of environments where there is a prevalence of high levels of uncertainty (Corrigan et al., 2013).

This research therefore aimed to evaluate the influence of causation and effectuation decision-making strategies on the performance of nascent entrepreneurship ventures in South Africa.

1.6 RESEARCH PURPOSE, RESEARCH QUESTION AND AIM OF THE STUDY

1.6.1 Research purpose

The purpose of the study is to assess the influence of causation and effectuation decision-making strategies on the performance of nascent entrepreneurship ventures in South Africa when applied in the business start-up phase.

1.6.2 Research question

The following research question will be addressed in the research study:

Does the decision by the entrepreneur to utilise effectuation or causation decision-making strategies at start-up influence the performance of nascent and new entrepreneurship ventures?

1.6.3 Research aims

The research study aims to expand on current academic research by assessing the influence of causation and effectuation decision-making strategies in the business start-up phase on the performance of nascent entrepreneurship ventures in South

Africa. In doing so, the research study aims to contribute to entrepreneurship literature by:

- Assessing whether the Effectuation Theory proposed by Sarasvathy (2001), in which the process followed in the creation of new ventures is characterised by experimentation, affordable loss, pre-commitment and flexibility, is a suitable alternative to the predominantly utilised causation approach. Causation is characterised by a plan based approach that includes market opportunity identification, efficient resource collation and stringent adherence to a plan in order to achieve the required results and obtain a sustainable competitive advantage (Andersson, 2011; Chandler et al., 2011).
- Assessing which approach results in a higher proportion of successful new ventures and therefore contributes to the debate about which approach is more suitable and appropriate, specifically in the context of a resource-constrained and developing market such as South Africa (Chandler et al., 2011).

The study focused on nascent entrepreneurs, irrespective of the sector or industry in which the entrepreneurial venture is participating. A similar approach was followed by Salamon (2016) in a study conducted in Germany. This research study primarily targeted entrepreneurs who were currently participating or had previously undergone incubation within incubators that are administered in South Africa. However, entrepreneurs who had not participated in an incubation programme but who meet the criteria of a nascent entrepreneur as conceptualised in Section 1.7 were accepted.

1.7 CONCEPTUAL/THEORETICAL DEFINITION OF TERMS

- **Causation:** A structured and defined process in the creation of new ventures that relies on rigorous planning and analysis of information that facilitates rational decision-making by the entrepreneur and that culminates in the selection of an opportunity with the highest expected rate of return. A specific outcome or opportunity is identified by the entrepreneur and only after that does the entrepreneur begin the process of collecting the resources required to achieve this preconceived or predetermined outcome and ultimately to acquire a competitive

advantage (Chandler et al., 2011; Fisher, 2012; Perry et al., 2012; Sarasvathy, 2001; Sarasvathy, 2009).

- **Effectuation:** An alternative approach to new venture creation as proposed by Sarasvathy (2001). This asserts that new venture creation is a process driven by four sub-dimensions and principles of effectuation that guide the behaviour of effectuators (entrepreneurs who utilise effectuation logic); namely, experimentation, affordable loss, pre-commitments and flexibility (Fisher, 2012; Read et al., 2009; Sarasvathy, 2001; Sarasvathy, 2009; Urban & Heydenrych, 2015).
- **Nascent Entrepreneurship:** These are entrepreneurial ventures undertaken by entrepreneurs aged between 18–64 and where the entrepreneurs have committed resources to starting a business. However, at this stage, the remuneration costs such as salaries, wages and payments to owners have not been paid for a period exceeding three months (Herrington et al., 2017). In this study, nascent entrepreneurs will also include entrepreneurial ventures undertaken by entrepreneurs aged between 18–64 that have paid remuneration costs such as salaries, wages and payments to owners for a period exceeding three months but less than 42 months (Herrington et al., 2017) and small businesses as defined in the National Small Business Act (Republic of South Africa, 1996).
- **Venture Performance:** The study focused exclusively on nascent entrepreneurs, which posed a limitation on the accessibility and availability of widely accepted objective measures of financial performance such as Return on Investment. The study, therefore, will utilise a subjective self-reported measure, employment growth, when assessing venture performance. This approach was deemed accurate in measuring venture performance, as previous studies have indicated that the manager's opinion on the current performance of the venture was indicative and consistent with the actual performance of the venture when compared to objective measures of performance (Urban & Heydenrych, 2015).

1.8 ASSUMPTIONS

The following assumptions were made in conducting the research study:

- Owners/lead entrepreneurs are best placed to answer the questions posed in the online survey, as they were the primary decision makers. (Chandler et al., 2011).
- Respondents would answer questions truthfully and to the best of their ability allowing the researcher to garner the best value from responses and data derived from responses (Heydenrych, 2013). The link to the online survey was emailed to all research participants.
- Respondents did not suffer from recall bias, which is the inability of a respondent to accurately recollect what they were thinking at the time due to the passing of time (Perry et al., 2012).

1.9 DELIMITATIONS OF THE STUDY

The following delimitations were observed in the study:

- The research study focused on nascent entrepreneurs in South Africa, irrespective of the sector or industry in which the entrepreneurial venture is participating or intends to participate. Salamon (2016) followed a similar approach in his research study conducted in Germany.
- The research study primarily targeted entrepreneurs who were participating or had previously participated in an incubation programme with incubators administered within the Republic of South Africa. However, with the knowledge that research survey response rates are very low, entrepreneurs who have not participated in an incubation programme but who meet the criteria of a nascent entrepreneur as conceptualised in Section 1.7 were accepted.
- The targeted respondents of the research survey are owners/lead entrepreneurs of the sampled ventures as they are deemed to have the required knowledge of the key details and activities conducted as part of the creation of the new venture (Chandler et al., 2011).

CHAPTER 2: LITERATURE REVIEW

2.1 INTRODUCTION

The following chapter provides a detailed analysis of the literature relevant to the study and it is structured as follows:

The chapter begins by exploring the theoretical background of decision-making strategies focusing on rational, intuitive and improvisational decision-making processes and their applicability to the entrepreneurial process.

The chapter then explores entrepreneurial decision-making, defines risk and uncertainty and discusses prediction and control as mechanisms to manage an uncertain future. Entrepreneurial opportunity is then explained through the use of the Discovery and Creation Theory.

A detailed analysis is conducted of causation and effectuation as standalone theoretical perspectives that are designed to describe the decision-making logic and subsequent behaviour of entrepreneurs when engaging in the entrepreneurial process. This analysis is not in keeping with previous studies, such as the seminal work by Sarasvathy (2001), which presented causation and effectuation as essentially two sides of the same coin by comparing and contrasting the principles that drive the two logics when introducing them to the reader. This is done deliberately to highlight the principles, characteristics, benefits and shortcomings of each decision-making logic independently from the other so that entrepreneurs can distinguish the merits of both logics.

The analysis is followed by overviewing and contrasting the alternative theoretical perspectives. The dependent variable, venture performance, is analysed and operationalised in relation to the study. Key terms are defined, key differentiating principles are outlined, and constructs are operationalised.

The chapter concludes by introducing, discussing and connecting the research hypotheses to literature that supports the hypotheses that have been proposed as part of this research paper.

2.2 Theoretical Background: Decision-Making

In introducing decision-making strategies as a broad construct, the research paper will lean on the work conducted by Mintzberg and Westley (2001), who describe three predominant and comprehensive decision-making methods that are applicable to the entrepreneurship process. These are rational “think first” decision-making, intuitive “seeing first” decision-making and improvisational “doing first” decision-making (Cunha, 2007; Mintzberg & Westley, 2001). The subsection below will expand on each of these decision-making strategies and relate them to the field of entrepreneurship.

2.2.1 Rational “think first” decision-making process

Rational decision-making processes, or what Mintzberg and Westley (2001) labelled the “think first” model of decision-making, is the most predominantly used method of decision-making. The decision-making logic is conceptualised by a systematic approach composed of four key steps to decision-making, namely:

“Define → Diagnose → Design → Decide”

(Mintzberg & Westley, 2001, p. 89).

When utilising this decision-making approach, an entrepreneur begins by defining the issue or conundrum at hand and a root-cause analysis is then conducted to diagnose the problem. When the entrepreneur understands the situation and when the root cause of the issue is clear, they are then in a position to develop solutions in the design step. Lastly, based on the knowledge gained from applying the previous steps, the entrepreneur determines the most feasible and appropriate action to take to resolve and address the issue (Cunha, 2007; Mintzberg & Westley, 2001).

The authors argue that rational “think first” decision making, although predominantly used, cannot be universally used in decision-making because it does not represent the normal processes that individuals follow when they make decisions naturally (Cunha, 2007; Mintzberg & Westley, 2001).

2.2.2 Intuitive “seeing first” decision-making processes

The second prominent method of decision-making is the intuitive decision-making process. This decision-making technique was labelled by Mintzberg and Westley (2001) as the “seeing first” model of decision-making and is also comprised of four key steps to decision-making; namely,

“Preparation → Incubation → Illumination → Verification”

(Mintzberg & Westley, 2001, p. 90)

When applying this decision-making logic, entrepreneurs begin by utilising and leveraging their human and intellectual capital, which is the knowledge, expertise, competences and skillsets that entrepreneurs have acquired over time through formal structures (education and training initiatives) and informal structures (lived experiences). Intellectual capital enhances entrepreneurial alertness by preparing entrepreneurs with the adequate combination of attributes to exploit entrepreneurial opportunities. This is referred to as the preparation phase of intuitive decision-making (Cunha, 2007; Venter, Urban, Beder, Oosthuizen, Reddy, & Venter, 2015; Zivdar, Imanipour, Talebi & Hosseini, 2017).

In the incubation phase, the entrepreneur consciously and subconsciously assesses entrepreneurial opportunities by applying their unique set of experiences, competencies and skills. The illumination phase refers to the culmination of the incubation phase when an entrepreneur conceives an innovative idea. The last phase is referred to as the verification phase, where the entrepreneur confirms the merits of the opportunity that has been identified or the entrepreneurial idea that has been conceived (Cunha, 2007; Mintzberg & Westley, 2001).

2.2.3 Improvisational “doing first” decision-making processes

The third and last method of decision-making is improvisational decision-making. This decision-making technique was labelled by Mintzberg & Westley (2001) as the “doing first” model of decision-making and is composed of three key steps; namely:

“Enactment → Selection → Retention”

(Mintzberg & Westley, 2001, p. 91).

As the name suggests, this decision-making process is driven by action. In instances where an entrepreneur is not sure of the path to follow or the opportunity to pursue, this approach prescribes that the entrepreneur acts and experiments and is referred to as the enactment phase of improvisational decision-making. Through this constant experimentation, an entrepreneur is able to determine in the selection phase (which opportunity can be successfully pursued or which action should be taken), while immediately abandoning those opportunities and actions that are found to be unsuccessful. The retention phase refers to a process of preservation, inculcation and repeated use of successful behaviours. This approach is particularly suitable for entrepreneurs in instances where there is an absence of data required to support rational decision-making (Mintzberg & Westley, 2001; Vuorinen, 2015).

The rational “think first”, intuitive “seeing first”, and improvisational “doing first” decision-making processes provide a broad understanding of the foundations of decision-making theories, their applicability to entrepreneurship and their influence on emerging and traditional theories, such as effectuation and causation.

Table 1 provides an overview of the various circumstances where each of the decision-making processes that were identified by Mintzberg and Westley (2001) are most suitable.

Table 1: Circumstances where decision-making approaches are most suitable

Decision-making process	Under what circumstances is the decision-making process mostly suitable?	Example
Rational (“think first”) decision-making process	• The problem or dilemma is well defined • There is reliable data available to the decision maker to support rational processes • The rationale for decision-making can be logically documented and understood • Control can be exercised	Enhance production process
Intuitive (“seeing first”) decision-making processes	• A combination of many elements assembled to create an innovative solution • There is total commitment to these solutions • Solutions are adequately communicated across various environments	New product development
Improvisational (“doing first”) decision-making processes	• The situation is unusual or new, and there is inadequate data or information on the subject. (These situations exist when entrepreneurs create or enter new markets) • Complex and intricate requirements would impede the process • A few simple relationship rules can help people move forward	New market development/ Introduction of disruptive technologies

Source: Mintzberg & Westley (2001)

2.3 ENTREPRENEURIAL DECISION-MAKING

Entrepreneurial decision-making theory concerns itself with the cognitive processes and the differing methods of thinking employed by entrepreneurs when creating and exploiting new entrepreneurial opportunities or identifying, evaluating and exploiting existing entrepreneurial opportunities (Cunha, 2007; Mintzberg & Westley, 2001; Grichnik, Baier, & Faschingbauer, 2016).

Entrepreneurial decision-making is central to the creation of new ventures, primarily because decisions made and subsequent actions taken by entrepreneurs who are engaged in the process of new venture creation are of fundamental importance in determining and influencing the ultimate success of a venture. However, because entrepreneurs, in line with Schumpeter's Theory of Creative Destruction, are mostly in pursuit of the creation and development of new markets, novel products and methods of production, these key decisions are often taken using limited, unreliable and often contradictory information in unique conditions of high uncertainty (Alvarez & Barney, 2005; Knight, 1921; Sarasvathy, 2001; Schumpeter, 1934; Sarasvathy, 2009; Shane & Venkataraman, 2000).

Figure 1 illustrates the environment in which Schumpeterian entrepreneurs prefer to operate. Quadrant 4 represents a scenario whereby an entrepreneur is engaged in the process of creating a new product for which a market does not exist and therefore will need to be established. Sarasvathy (2009) describes this quadrant as a suicide quadrant, as it is characterised by Knightian uncertainty.

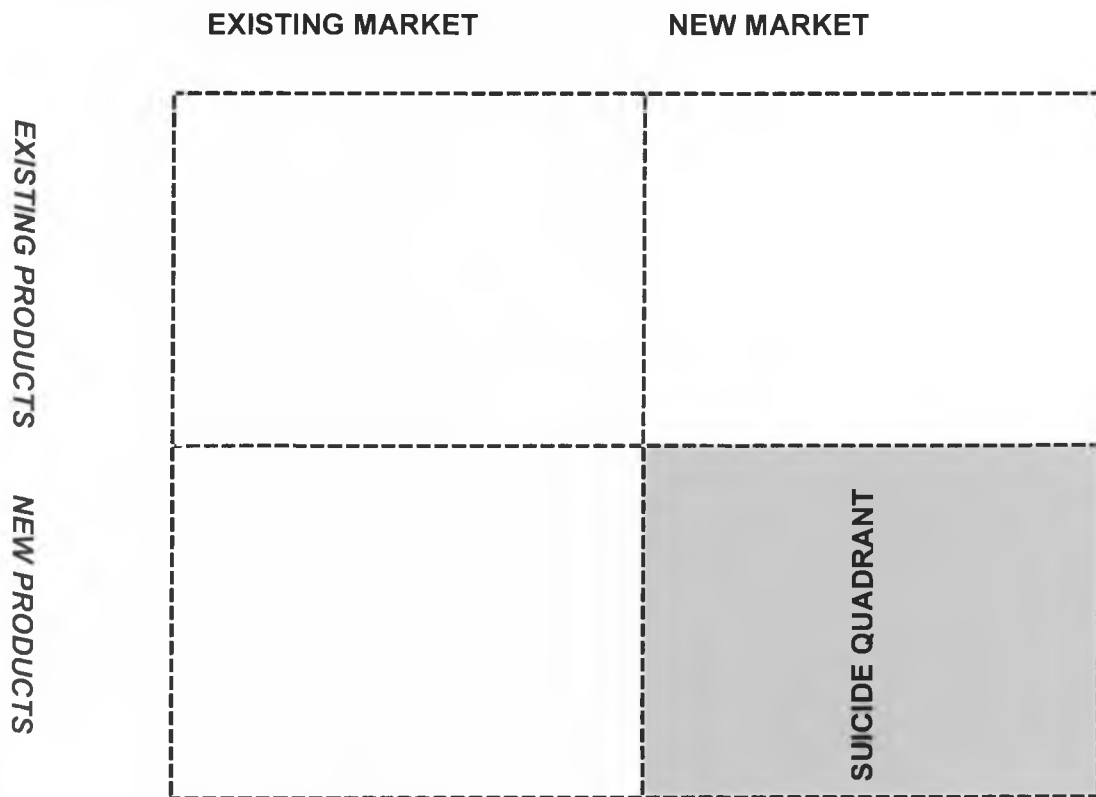


Figure 1: Typology of new venture business models

Source: Sarasvathy (2009)

It is this uncertainty and lack of reliability of information that makes it challenging for entrepreneurs to determine how to structure and coordinate a new venture. It is also, however, this uncertainty that was identified by Knight (1921) as a key necessity and a requirement for the existence of profit. Conditions that are considered risky are regarded by Knight (1921) as less profitable or not profitable at all, and they are therefore unattractive to entrepreneurs.

Uncertainty is, in fact, what differentiates entrepreneurial decision-making from other forms of decision-making in different spheres that are judged to be taken in conditions of risk and not uncertainty (Alvarez & Barney, 2005; Reymen et al., 2015).

Alvarez and Barney (2005) aptly describe this nexus between entrepreneurial opportunity and entrepreneurial decision-making as follows:

"If the economic value associated with a new market opportunity is uncertain, then it is difficult to know, for sure, which resources should be assembled and coordinated, how resource assembly and coordination decisions should be made, and what the residual profits from exploiting such an opportunity might be" (Alvarez & Barney, 2005, p. 777).

An understanding of the concepts of risk and certainty is crucial to our comprehension of causation and effectuation and their fit or applicability in the entrepreneurial process. This assertion is supported by prominent literature on the subject, such as **Chandler et al. (2011)**, who, in their validation study of measures for causation and effectuation, found that the relationship between causation and uncertainty is negatively aligned, while the relationship between effectuation, particularly its sub-dimension of experimentation, is positively aligned with uncertainty.

Sarasvathy (2009) supports this finding and posits that in situations when an entrepreneur is required to make a decision where the distribution of risk is known, the entrepreneur should utilise the traditional approach to decision-making, which leverages off analysis and prediction instruments (for example, the causation process). Sarasvathy also asserts that in situations where the distribution of risk is not known, the entrepreneur should adopt estimation techniques (for example, the effectuation process).

The following subsection expands on the concepts of risk and uncertainty as they relate to the entrepreneurship process and lays a foundation for the interrogation of the appropriateness of causation and effectuation decision-making theories, differing conditions of risk and uncertainty.

2.3.1 Entrepreneurial decision-making: Defining risk and uncertainty

There are multiple schools of thought and disciplines that have defined the concepts of risk and uncertainty but for this study, we leverage the initial work of Knight (1921) and subsequent interpretations of his work in describing and explaining risk and uncertainty. In its simplest form, risk refers to instances and circumstances where the distribution of a future event or result is known to the participants or entrepreneurs.

Uncertainty, on the other hand, refers to instances and circumstances where the distribution of a future event or result is not known (Brooke, 2010; Knight, 1921).

In providing a practical explanation of the concepts of risk and uncertainty, we will use “Rock–Paper–Scissors”, a game familiar to many people, which is used to resolve disputes and disagreements, in an entertaining manner, throughout the world. When engaging in a duel of “Rock–Paper–Scissors”, each opponent can either select rock, paper or scissors as their weapon of choice for the duel. The rules of the game are clear to both participants: rock defeats scissor, scissor defeats paper, paper defeats rock. When the participants are engaged in this duel, they can predict and measure with adequate precision the probability of victory and defeat. “Rock–Paper–Scissors” is an example of an activity that is characterised by risk (Sarasvathy, 2009).

We then consider a similar scenario where the ultimate prize is still defeating an opponent and resolving a squabble through a duel; however, in this scenario there are no parameters and no rules. Available weapons have not been defined and the rules of engagement have not been stipulated. Let us call this game “Not Known, Unknown and Unknowable”. In this scenario, when the participants engage in their duel, they cannot predict the probability of victory or defeat. They do not know which weapons are at the disposal of their opponent, the strength of each weapon in relation to the other weapons, the rules and parameters of the game and they cannot refer to previous duels for information because the game has never been played before. The game of “Not Known, Unknown and Unknowable” is an example of an activity that is characterised by uncertainty (Sarasvathy, 2009).

Knight (1921) describes and distinguishes between three types of uncertainty that apply to the entrepreneurial process of new venture creation:

- The first type of uncertainty is identified as instances where the distribution of the future is known, and therefore the individual entrepreneur can make use of available information to calculate or predict the odds for success or failure; however, they cannot predict success or failure (Brooke, 2010; Knight, 1921; Sarasvathy, Dew, Velamuri & Venkataraman, 2003; Sarasvathy, 2009).
- The second type of uncertainty is identified as instances where the distribution of the future is available to the entrepreneur but it is not known in advance. The

entrepreneur in this scenario is required to estimate the distribution through a process of repeated experimentation and learning from experiences. In this scenario, the entrepreneur cannot determine the probability of success or failure; however, they are able to determine and decipher the likelihood of the ultimate success of a new venture through feedback and information obtained from multiple experiments. The fundamental driver for the continued experimentation is the belief that it will bear great reward (Brooke, 2010; Kerr, Nanda & Rhodes-Kropf, 2014; Knight, 1921; Sarasvathy et al., 2003; Sarasvathy, 2009).

- The third and last type of uncertainty is referred to as true uncertainty or Knightian uncertainty (Sarasvathy, 2009). True uncertainty, as the name implies, refers to instances where the future is completely unknown and cannot be known to the entrepreneur. In this scenario, the entrepreneur is unable to utilise information or historical data to calculate or predict the odds for success or failure, as it does not exist. Should an entrepreneur pursue opportunities that exist in an environment of true uncertainty, they stand to benefit significantly from a short-lived monopoly in profit (Brooke, 2010; Knight, 1921; Sarasvathy et al., 2003). This is explained and expanded upon by Brooke (2010) interpreting true uncertainty. The author interprets the relationship between true uncertainty and profit as follows: "...uncertainty is the condition necessary for profit to exist. If the future is merely risky, then profit cannot exist" (Brooke, 2010, p. 7).

Table 2 provides a summary of approaches that are deemed suitable for use when navigating through the complexities of the various types of uncertainty that was identified by Knight (1921).

Table 2: Suggested approaches in dealing with uncertainty

Type of uncertainty	Suggested approaches to dealing with uncertainty
Known distribution-unknown result	Predictive strategies, analytical methods
Unknown distribution-unknown result	Predictive strategies, estimation methods, experimentation, testing, iterative learning
Unknowable distribution-unknown outcome	Non-predictive strategies, effectuation

Source: Knight, 1921; Sarasvathy, 2009

2.4 INDEPENDENCE OF CONTROL FROM PREDICTION

The concepts of prediction and control are central to strategy development and entrepreneurship because they frame and direct how entrepreneurs should manage a risky and uncertain future. Wiltbank, Dew, Read and Sarasvathy (2006), in their assessment of strategy making and management tools, recognised that when dealing with future actions there are two predominant methods that are put forward by scholars. Prediction approaches subscribe to the view that predicting the future is paramount to controlling it (Sarasvathy, 2001; Sarasvathy, 2009; Wiltbank et al., 2006). On the other hand, adaptation approaches contend that the need for predicting the future becomes less relevant when the entrepreneur can quickly respond and adapt to the changes (Wiltbank et al., 2006).

Positioning quadrants are captured in the left-hand side of the proposed framework (Figure 2). Read et al. (2009) described these positioning approaches as “opportunities found” approaches as they are intended to fit or position a firm within an exogenous environment.

Rational planning approaches (Quadrant 1), view prediction as an enabler of control and therefore manage an uncertain future through prediction. Prediction allows entrepreneurs to take comfort that the decision or approach that they are taking will result in a favourable outcome and therefore those entrepreneurs who are superior at prediction will consistently perform better than those that are not (Wiltbank et al., 2006). Such approaches require management to be continuously aware of crucial market information and data and continuously analyse such data, thus ensuring that they are aware of market trends and align their strategies accordingly (Schendel & Hofer, 1979 as cited in Wiltbank et al., 2006). Planning strategies are adopted by entrepreneurs who perceive the environment to be outside their control but predictable. Sarasvathy (2001) fashioned the term “causation” to refer to this grouping of approaches.

Adaptive approaches (Quadrant 2), view learning as an enabler to adaptation and therefore align with the view that agility and flexibility enable an organisation to adapt rapidly to ever-changing situations, placing them in a position to take advantage of this disequilibrium. Adaptive strategies are utilised by entrepreneurs who perceive their environment to be unpredictable. These approaches advocate a reduction of use of predictive instruments and an increased reliance on experimentation, iterative learning and flexibility to take advantage of emergent opportunities (Masakowski, 1997; Sarasvathy, 2001; Schoemaker, 2002 as cited in Wiltbank et al., 2006; Wiltbank et al., 2006).

A key component of adaptive strategies is learning through experimentation as it provides an opportunity for entrepreneurs to obtain feedback from the market and thus revisit their strategy to respond to such feedback (Wiltbank et al., 2006). This approach recognises that the processes that come with the planning approach are cumbersome, onerous and can sometimes result in stubbornness by the organisation to deviate from the predetermined strategy (Wiltbank et al., 2006). The approach places value on agility and responsiveness through the ability to respond to opportunity creating disequilibrium in the market (Mintzberg, 1990). The approach has received empirical support for its appropriateness for use in conditions of uncertainty (Wiltbank et al., 2006).

Wiltbank et al. (2016) acknowledge that the ultimate objective, regardless of the strategy-making approach applied by an entrepreneur, is to achieve the goals and outcomes that they initially set out to achieve. They argue that even though the planning and adaptive techniques are fundamentally different in their treatment of prediction, it is their positioning of the organisation within an external environment that they critique. Their argument lies in the fact that planning and adaptive approaches to strategy making emphasise positioning, meaning that they essentially manage or try to predict the outside environment and outside factors that could influence the organisations. Additionally, they state:

“In environments characterized by Knightian uncertainty, prediction and control are not just empirically mismatched; they are conceptually at odds. Prediction can never be adequate for the purpose of control, even in principle, because of the role of human creative action in actually producing a non-existent – not just a hard-to-predict – future” (Wiltbank et al., 2006, p 998).

They contend that in environments of Knightian uncertainty, where Schumpeterian entrepreneurs innovate, create new products and markets, prediction is not an effective tool to obtain control. They maintain that in these environments, entrepreneurs need to obtain control of an uncertain future independently from prediction.

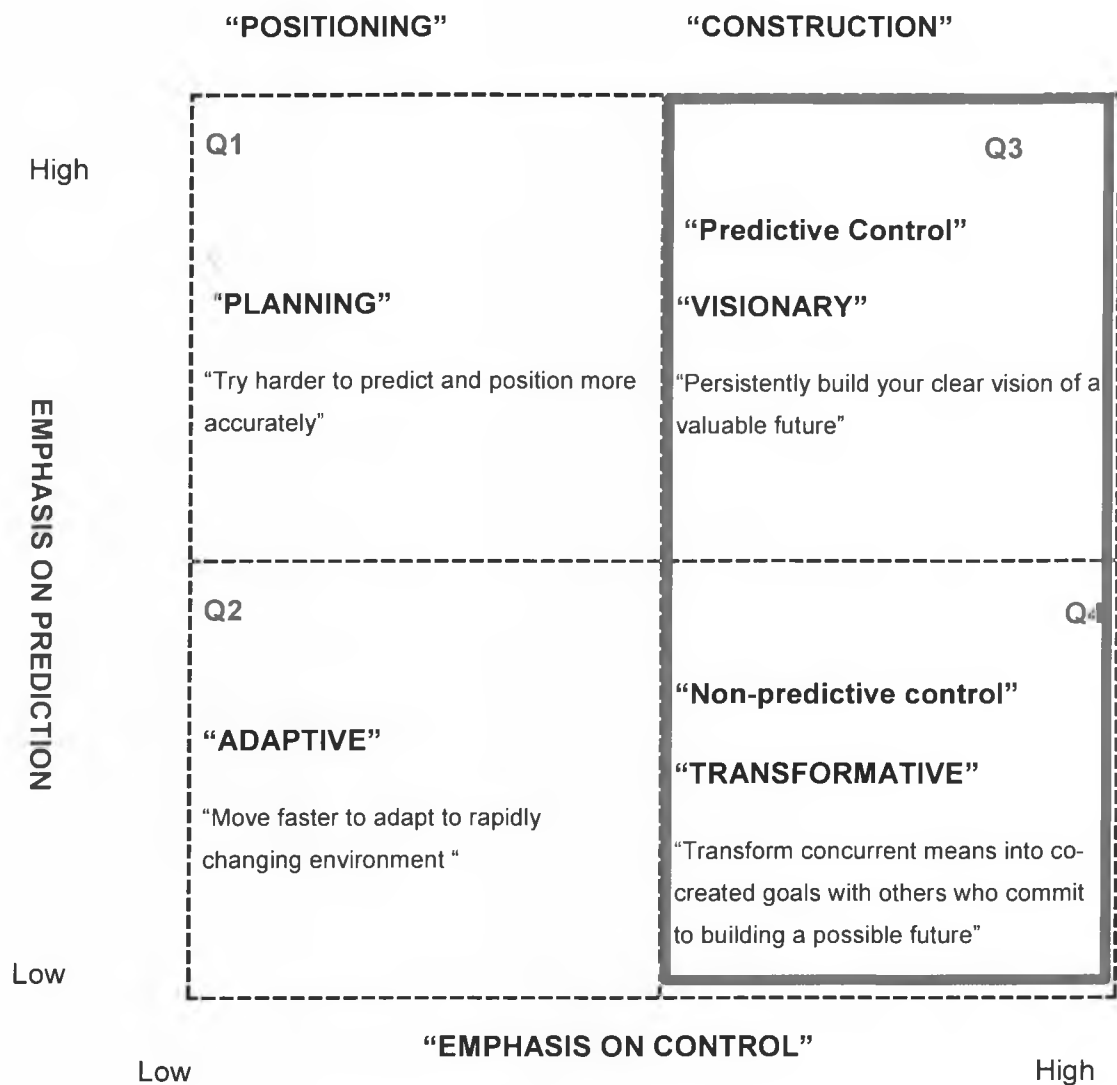


Figure 2: Framework for prediction and control

Source: Wiltbank et al., 2006 (p. 983)

Therefore, they present an alternative approach to strategy making that would result in the same positive outcomes, but that places the control for creation in the hands of proactive entrepreneurs. It requires that entrepreneurs control internal factors that are within the control of the organisation and do not try to predict or adapt to outside factors that are not in their control (Wiltbank et al., 2006).

They develop and suggest additional dimensions to the framework (Figure 2) that outline key strategic approaches to the management of the future that rely on control and not prediction. Figure 2 illustrates the framework of control with the positioning approaches, previously discussed, including rational planning and adaptive approaches in the left-hand quadrant and the emergent construction approaches with the visionary and transformative approaches in the right-hand quadrant.

Construction approaches are fundamentally different to positioning approaches as they focus on the proactive initiatives and actions of entrepreneurs in their effort to form the future (Wiltbank et al., 2006). Read et al., (2009) describe these construction approaches as opportunities-made approaches intended to form an endogenous environment.

Construction approaches are at play in instances where entrepreneurs develop and create new markets and products as they "...assume either the non-existence of key elements of the environment (presenting opportunities for constructing them), or the organization's ability to affect the evolution of those elements in significant ways" (Wiltbank et al., 2006, p. 989).

Visionary strategies (Quadrant 3) are utilised by entrepreneurs who perceive the environment as predictable and flexible, thus open to manipulation in order to achieve their set goals. There is a strong emphasis on both control and prediction. These entrepreneurs pursue predetermined future outcomes or visions and proactively try to make their vision or goals a predetermined reality (Wiltbank et al., 2006).

Transformative strategies (Quadrant 4) are used by entrepreneurs who perceive that the future does not exist and therefore seek to create it through collaboration with others. These approaches pursue the creation of new markets and products without the use of predictive or visionary strategies (Wiltbank et al., 2006; Sarasvathy, 2001). Goals are not clearly outlined from the onset but are developed over time and with experience (Sarasvathy, 2001). An example of transformative strategy is the effectuation model that was introduced by Sarasvathy (2001); this will be expanded upon later in the chapter.

The value in the contribution of Sarasvathy (2001) to entrepreneurial literature lies in the additional possibilities that are available to entrepreneurs in the process of strategy making. The value lies in the interrogation of the suitability of traditional approaches to modern-day entrepreneurship and decision-making and the introduction of new processes and methods. It is then up to the entrepreneur, with an understanding of the environment they operate in, to adopt the correct approach to strategy making (Wiltbank et al., 2006).

2.5 ENTREPRENEURIAL OPPORTUNITY: DISCOVERY AND CREATION THEORY

The question of whether entrepreneurial opportunities are created through the actions of proactive entrepreneurs or whether entrepreneurial opportunities are discovered by alert entrepreneurs has been debated by entrepreneurs and scholars alike (Alvarez & Barney, 2007). Entrepreneurship literature has leaned towards research on the discovery of opportunities, and there is an insufficient body of knowledge covering how entrepreneurs create opportunities (Read et al., 2009). Establishing whether entrepreneurs search for opportunities or create opportunities is significantly important, as the outcome of that examination will drive and influence the approach that should be taken by entrepreneurs in their pursuit of entrepreneurial opportunities. It will also influence the type of skill (searching or creating through experimentation) that entrepreneurs need to enhance to improve their ability to exploit opportunities (Alvarez & Barney, 2007).

There are two predominant schools of thought in entrepreneurship literature that seek to explain the relationship between individual entrepreneurs and opportunities. The first of these affirms that opportunities exist within the environment and that it is incumbent on alert entrepreneurs to identify these opportunities and eventually exploit them (Alvarez & Barney, 2007). This school of thought is supported by scholars such as Shane (2003) and Shane and Venkataraman (2000). The second school of thought credits the existence of entrepreneurial opportunities firmly to the action taken by entrepreneurs to create such opportunities (Alvarez & Barney, 2007). This school of thought is supported by Sarasvathy (2001).

The Discovery Theory and the Creation Theory are two theories that align to the schools of thought mentioned previously. These theories are designed to enhance our

understanding of the origin of entrepreneurial opportunities and explain the process behind the formation of entrepreneurial opportunities.

The subsection below will briefly explain each theory and its relevance to the entrepreneurial process.

2.5.1 Discovery Theory

The Discovery Theory of Entrepreneurial Action supports the view that entrepreneurial opportunities exist in markets as a result of imbalances within those markets. The theory differentiates itself from other theories in that it asserts that imbalances in the market are caused by changes and movements in outside factors that influence that market. These factors include changes in what customers want and need, developments in technology and changes in the legislative and political environment (Alvarez & Barney, 2007; Shane, 2003; Shane & Venkataraman, 2000).

If opportunities exist naturally in markets and are formed by outside influences that cause competitive imbalances within those markets, it can, therefore, be interpreted that entrepreneurial opportunities exist in the absence of entrepreneurial action (Alvarez & Barney, 2007).

The theory therefore asserts that it is, in fact, alert entrepreneurs who actively scan and search the environment who position themselves, not to create opportunities, but to identify and exploit existing opportunities (Alvarez & Barney, 2007).

Decision-making conducted according to the Discovery Theory is performed in conditions of risk rather than uncertainty. As has been highlighted in previous sections of the chapter, environments that are characterised by risk are those where an entrepreneur can calculate the probability of success or failure or the outcome of decisions and actions taken. This is possible, as there is adequate information available to facilitate these calculations (Knight, 1921); this is in line with the discovery theory, which promotes the collection and analysis of data by alert entrepreneurs to assess the possible outcome of pursuing entrepreneurial opportunities (Alvarez & Barney, 2007).

2.5.2 Creation Theory

The Creation Theory places the onus, control and initiative for the existence of entrepreneurial opportunities in the hands of the entrepreneur. The theory asserts that entrepreneurial opportunities are formed through the proactive action of entrepreneurs and not through external forces that are not within the control of entrepreneurs (Alvarez & Barney, 2007; Sarasvathy, 2001).

In the absence of ready and waiting entrepreneurial opportunities, it is only then through entrepreneurial action and market responses to those actions that entrepreneurial opportunities are developed, re-developed and eventually created. The Creation Theory advocates the creation of new markets and not just the exploitation of existing markets. Innovative entrepreneurs can introduce new products and services within these new markets (Alvarez & Barney, 2007).

Decision-making conducted under the Creation Theory is conducted under conditions of uncertainty rather than risk. The primary reason for this is based on the core assumption of the theory that entrepreneurial opportunities do not naturally exist in the environment. Therefore, if these opportunities do not naturally exist, there is no feasible way in which entrepreneurs could collect the necessary information to conduct calculations to determine the probability of success or failure or the outcome of decisions and actions taken (Knight, 1921; Alvarez & Barney, 2007).

Alvarez and Barney (2007) note that there is no empirical evidence to claim or to prove the superiority of the one theory over the other; however, it is important that entrepreneurs are able to clearly establish the conditions that they operate in, based on their understanding of the theories, for their actions to be effective. This is supported by Wiltbank et al. (2016). As an example, the Discovery Theory is synonymous with conditions characterised by risk and therefore an entrepreneur must be able to identify this and rely on the correct risk mitigation tools and approaches that are suitable for this environment.

Table 3 provides an overview of the key assumptions on opportunities, the entrepreneur and decision-making of the Discovery and Creation Theories.

Table 3: Key assumptions: Discovery and Creation Theory

Assumption	Discovery Theory	Creation Theory
Opportunities	Opportunities naturally exist autonomously from entrepreneur action within the markets	Opportunities are formed through the proactive action of entrepreneurs
Entrepreneurs	Entrepreneurs differ from non-entrepreneurs by their ability to identify and discover opportunities	Entrepreneurs may or may not differ from non-entrepreneurs before an opportunity is created but differ after creation
Decision making	Characterised by risk	Characterised by uncertainty

Source: Alvarez & Barney, 2007

In the previous section of the research report, decision-making as a broad construct that is applied across multiple disciplines and applies to entrepreneurship was introduced. This provides the theoretical background necessary to support our understanding and subsequent analysis of causation and effectuation as decision-making strategies. Entrepreneurial decision-making in conditions characterised by risk, uncertainty and Knightian uncertainty was explained. Prediction and control and their relevance to strategy making were introduced, and the research report briefly explained two key theories that are fundamental to our comprehension of causation and effectuation: the Creation Theory and the Discovery Theory. These four components: decision-making, risk and uncertainty, prediction and control and entrepreneurial opportunity (creation and discovery theory) form the basis of causation and effectuation and therefore provide a foundation for the analysis of causation and effectuation decision-making strategies.

2.6 EFFECTUATION: AN EMERGING THEORY

The following section provides a detailed analysis of effectuation as a theory and as an entrepreneurial decision-making strategy. The section begins with a brief explanation of the reasoning, the need and the gap in entrepreneurship literature that necessitated the development of effectuation as a theory. Thereafter, effectuation as

a decision-making logic is unpacked, and the principles and sub-dimension that support the logic are explained.

2.6.1 A need for diverse theoretical perspectives

The motivation for the creation and development of effectuation as a theory and logic of decision-making centres primarily on the desire to address three pertinent concerns and gaps within the field of entrepreneurship. The first of these concerns is encapsulated in the question: how do entrepreneurs navigate through and deal with Knightian uncertainty when they embark on the process of creating a new venture? Sarasvathy (2001) identified this as a key opportunity to expand on the significant work that was conducted by Knight (1921) who, as presented in the previous section, identified three types of uncertainty that are pertinent to the process of entrepreneurship. In addition, Knight (1921) identified approaches that are suitable for entrepreneurs to use as tools to navigate through the first two types of uncertainty; however, Knight fell short of identifying and suggesting an approach that entrepreneurs could utilise in dealing with the most significant type of uncertainty: Knightian uncertainty (Sarasvathy, 2009).

The second gap in the literature that Sarasvathy (2001) seeks to address through the development of the Effectuation Theory is the absence of a decision-making strategy that would assist entrepreneurs in navigating through a complex but common state of “goal ambiguity” (Sarasvathy, 2009, p. 70). Sarasvathy describes goal ambiguity as a common occurrence in the process of entrepreneurship whereby entrepreneurs who embark on the process of new venture creation, have not and sometimes cannot determine the ultimate goal and objective of the new venture. This occurs mainly when entrepreneurs are in pursuit of novel outputs, in line with Schumpeter’s Theory of Creative Destruction. In many instances, these entrepreneurs are not sure of the ultimate product that they intend to sell, as it has not been developed and the market they intend to sell into, as it does not exist (Sarasvathy, 2009; Schumpeter, 1934).

Lastly, Sarasvathy (2009) sought to address “environmental isotropy” (p. 69), a state of ambiguity whereby entrepreneurs are not certain which pieces of available data and information they should register and therefore allow to influence their decision-making and which they should discard (Sarasvathy, 2009). This is a dangerous state for an

entrepreneur and often results in entrepreneurial inertia, whereby an entrepreneur does not act purely because of the uncertainty that characterises the situation.

2.6.2 Conceptualising effectuation

A logic of control which affirms the view that a need for predicting the future by entrepreneurs becomes less relevant when entrepreneurs can control it (Sarasvathy, 2001; Sarasvathy, 2009; Wiltbank, Dew, Read, & Sarasvathy, 2006). Sarasvathy, Kumar, York and Bhagavatula (2014) capture the essence of this view by stating, "...effectuation consists of heuristics that embody non-productive forecasting control as opposed to predictive tools" (p. 72).

Sarasvathy (2001) through interaction with expert entrepreneurs modelled and created a theory that is designed and grounded in the belief that individual entrepreneurs through their actions create and form the future and its associated events. This emerging theory firmly positions the entrepreneur as the central instigator in the creation of future events. It is therefore only through their initiative and proactive action that the future is created and therefore controlled (Sarasvathy, 2001; Sarasvathy, 2009; Sarasvathy et al., 2014).

Effectuation provides a model for entrepreneurs to adopt in environments that are characterised by constant change and that are typified by a high level of uncertainty (Sarasvathy, 2001; Sarasvathy, 2009). In this type of environment, the target market and the customer can only be established based on actual results rather than forecasts. This, therefore, necessitates the ability and willingness by an entrepreneur to revisit and re-establish goals and objectives based on the outcome of these results. This is possible because when applying the effectuation model, entrepreneurs are not focused on goals that they cannot control, but they concentrate more on controlling the means and resources that are at their disposal (Sarasvathy, 2001; Sarasvathy, 2009).

Sarasvathy (2001) proposed behavioural principles that capture the essence of effectual logic. These have been interrogated, developed and revisited by the author and multiple scholars over the years as the profile of effectuation has increased. These principles are noted as a set of given means ("Bird in the hand" principle), the

affordable loss principle, pre-commitments and strategic partnerships (“crazy quilt” principle), exploiting environmental contingencies through flexibility (“lemonade” principle), continuous experimentation and the “pilot in a plane” principle (Chidakwa, 2016; Sarasvathy, 2009)

The next subsection will unpack and explain each behavioural principle that is associated with of effectuation.

2.6.3 A set of given means principle (“Bird in the hand” principle)

Initially known as a “Bird in the hand” principle, this principle of effectuation is at the very core of what effectuation is and what it is not. It is what differentiates effectuation from other theories and logics of decision-making, such as causation. As has been already alluded to in earlier sections of this chapter, effectuation aligns itself with the school of thought that believes that entrepreneurial opportunities are created by entrepreneurs (Fisher, 2012; Read et al., 2009; Sarasvathy, 2001; Sarasvathy, 2009; Urban & Heydenrych, 2015). Therefore, in the process of creating and exploiting entrepreneurial opportunities, an effectuator, who is the central protagonist, has three types of means or resources at their disposal. Sarasvathy (2009) described these means as “who I am”, “what I know” and “who do I know” (p. 78).

Table 4 provides a view of the various types of means/resources that effectuators have at their disposal and should utilise when engaging in the process of entrepreneurship.

Table 4: Set of means available to effectuators

Level	Who am I?	What do I know?	Who do I know?
Individual level	• Intellectual capital including personal knowledge and abilities • Traits • Individual preference	What the individual entrepreneur knows and has learnt	Social capital: Network of personal and professional relationships

Source: Sarasvathy 2001; Sarasvathy 2009; Chidakwa, 2016

The first of these means refers to the individual identity and characteristics of the entrepreneur (“who I am”) (Sarasvathy, 2009, p. 78). These characteristics include,

but are not limited to, the abilities and individual traits, religious and cultural beliefs of the individual entrepreneur. It is the experiences that mould and make that individual unique (Sarasvathy, 2001; Sarasvathy, 2009; Sarasvathy et al., 2014). The second in a set of means refers to the knowledge at the disposal of the effectuator ("what do I know"). The last in a set of means at the disposal of an effectuator refers to the social capital at the disposal of the individual entrepreneur ("who do I know"). These are the networks that the entrepreneur has built through interaction with individuals in formal and informal settings (Sarasvathy, 2001; Sarasvathy, 2009; Sarasvathy et al., 2014).

The theory of effectuation, therefore, requires an entrepreneur to establish the extent of the means at their disposal through a process of reflection and self-interrogation. The product of the process of self-interrogation and stocktaking by an effectuator should be an indication of which opportunities an effectuator can pursue, based on the set of means at their disposal.

Figure 3 is an illustration of the effectual approach in terms of the treatment of goals and the resources (means) required to achieve those goals. When utilising effectual logic, the entrepreneur defines the means at his disposal and attempts to utilise those means in pursuit of multiple-end goals (Duening, Shepherd, & Czaplewski, 2012).

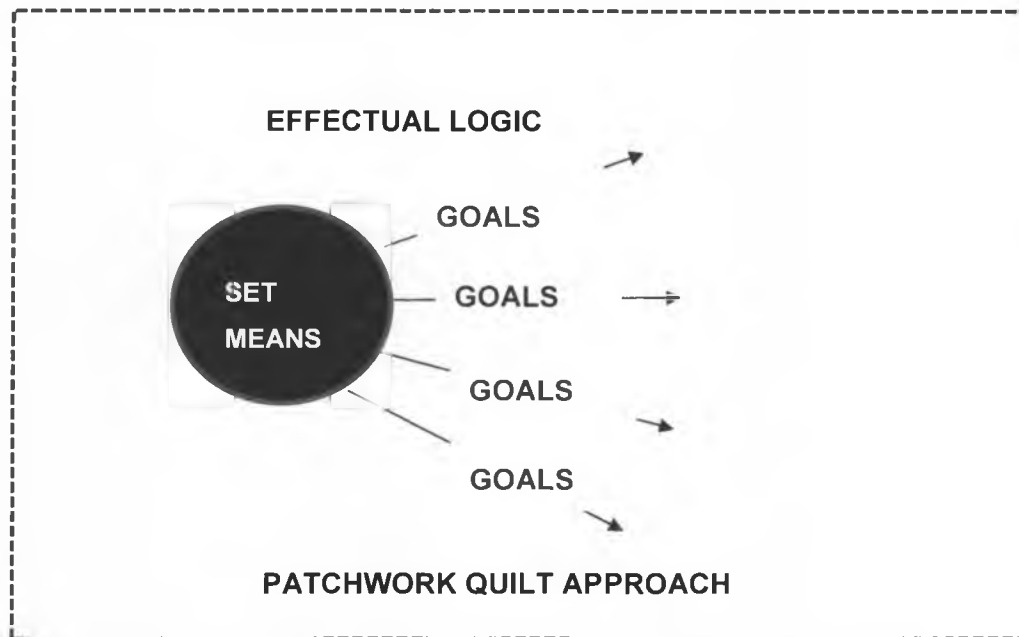


Figure 3: Illustration of Mean-Goal relationship under effectuation model

Source: Adapted from Society for Effectuation Action (2017). Retrieved 28 May 2017 from http://www.effectuation.org/?page_id=20

Once an effectuator has established the extent of the resources he has at his disposal, he can then progress and apply the next principle of effectuation: affordable loss.

2.6.4 Affordable loss principle

A prudent approach in the pursuit of entrepreneurial opportunities where resources (defined through the application of a set of given means principle) that are committed by the entrepreneur or the entrepreneurial venture are limited to what stakeholders can afford to lose in pursuit of that entrepreneurial opportunity (Chandler et al., 2007; Chandler et al., 2011; Sarasvathy, 2001; Sarasvathy, 2009).

Affordable loss is characterised by a focus on limiting the downside potential of pursuing entrepreneurial opportunities. This means that entrepreneurs must explore and utilise methods of creating new and innovative products and delivering these products to new or existing markets in the least resource and capital-intensive manner, thus limiting the outlay of key resources such as time and money, essentially reducing or managing risk (Read & Sarasvathy, 2005; Sarasvathy, 2009).

The affordable loss construct is a fundamental principle that entrepreneurs need to apply when utilising the effectuation model, specifically at the business start-up phase as the construct dictates through non-predictive methods which experiments should be pursued by the entrepreneur (Chandler et al., 2011; Sarasvathy, 2001; Sarasvathy, 2009).

The affordable loss principle forces effectuators to ascertain, prior to pursuing an opportunity, whether the entrepreneurial venture will continue to exist in the event of a complete failure of the venture/opportunity that they are pursuing. Any ventures that are judged to breach the affordable loss threshold are not considered or pursued any further. They are essentially viewed as a waste of resources and ultimately hinder the pursuit of other more lucrative ventures that fit the requirement of the affordable loss principle (Duening et al., 2012; Chandler et al., 2007; Chandler et al., 2011; Sarasvathy, 2001; Sarasvathy, 2009; Urban & Heydenrych, 2015).

Once an effectuator has established the extent of resources at his disposal and the portion of what he is willing to lose in pursuit of an entrepreneurial opportunity, he can then progress and apply the next principle of effectuation, pre-commitments and strategic partnerships principle ("Crazy Quilt" principle).

2.6.5 Pre-commitments and strategic partnerships principle ("Crazy Quilt" principle)

Effectuators leverage networks and enter into strategic business alliances with various stakeholders, including customers, suppliers and other strategic partners. Effectuators welcome partnerships and the possibility of co-creation, which is in line with the "patchwork quilter" analogy introduced in the previous chapter, where multiple stakeholders, who bring unique and differing means, come together and create something of significance. The affinity to partnerships is driven by the intention to manage the risk that comes with an unpredictable future and ultimately driving the growth of the new venture through strategic alliances and partnerships (Chandler et al., 2011; Sarasvathy, 2001; Sarasvathy, 2009; Urban & Heydenrych, 2015).

Sarasvathy (2009) notes that the principle of pre-commitments and strategic partnerships supplement and combine effectively with the previously mentioned principles of effectuation. It allows effectuators, who at this stage have determined

what means they have on hand and defined the resources they are willing to lose should the venture fail, to supplement their means and resources through partnership with other stakeholders who have committed tangible resources. These partnerships are instrumental to an effectuator as they allow the venture to deliver products to new or existing markets in the least resource and capital-intensive manner for the effectuator (Read & Sarasvathy, 2005; Sarasvathy, 2009).

2.6.6 Exploiting environmental contingencies through the flexibility principle (“Lemonade” principle)

Effectuators welcome, value and exploit environmental contingencies through their flexibility. The “Lemonade” principle grounds itself in the belief that the future is dynamic and ever changing and the entrepreneur cannot therefore predict the events that will occur in the future. However, an effectuator, through his adaptability, can take advantage of opportunities that stem from these unexpected events and lead to unexpected discoveries (Chandler et al., 2011; Duening et al., 2012; Sarasvathy, 2001; Sarasvathy, 2009; Urban & Heydenrych, 2015).

Effectuators view contingencies as an opportunity to shape and reshape the final look of the venture. This is possible because there is no pre-commitment to the look of the final venture and there is a willingness to shape the venture as more information is received. Effectuators take advantage of surprises and view them as entrepreneurial opportunities that they can exploit through their flexibility and lack of stringent and predefined goals (Duening et al., 2012; Sarasvathy, 2001; Sarasvathy, 2009; Sarasvathy et al., 2014).

2.6.7 “Experimentation” principle

The experimentation principle refers to the willingness by the effectuators to continuously experiment with an array of products and business models when attempting to enter or create a market. Through this experimentation and guided by the feedback received from experiments, the effectuator ultimately settles on the most feasible business to pursue and embarks on a process of obtaining a sustainable competitive advantage (Chandler et al., 2007; Chandler et al., 2011; Sarasvathy, 2001; Sarasvathy, 2009; Urban & Heydenrych, 2015).

This is a fail-forward approach, where experiments that prove to be unsuccessful are immediately abandoned and with that experience and knowledge in hand, the entrepreneur, without wasting additional time and resources, continues experimenting with other products and business models (Chandler et al., 2007; Chandler et al., 2011; Sarasvathy, 2001; Sarasvathy, 2009; Urban & Heydenrych, 2015).

2.6.8 “Pilot in a plane” principle

The Effectuation Theory reaffirms the entrepreneur as the protagonist in the creation and fabrication of an unpredictable future (Sarasvathy, 2009). It is that belief that is at the very core of the “Pilot in a Plane” principle. Sarasvathy (2009) uses an analogy that is appropriate in describing an act whereby an individual is regaining control. She describes this principle by likening it to having a pilot in a plane who has been tasked with overseeing, managing, mitigating and controlling an unpredictable future (Sarasvathy, 2009).

Figure 4 provides an illustrative process flow applied when utilising the effectuation approach to entrepreneurship. The diagram displays the process articulated above, beginning with a set of means (“who I am”, “what I do” and “who I know”) at the disposal of an entrepreneur. This is followed by a definition of goals (“what can I do?”) based directly on the unique set of means at the disposal of the effectuator. This is followed by engagement with stakeholders and the formation of strategic alliances which entail a commitment of resources and the reduction of uncertainty and risk.

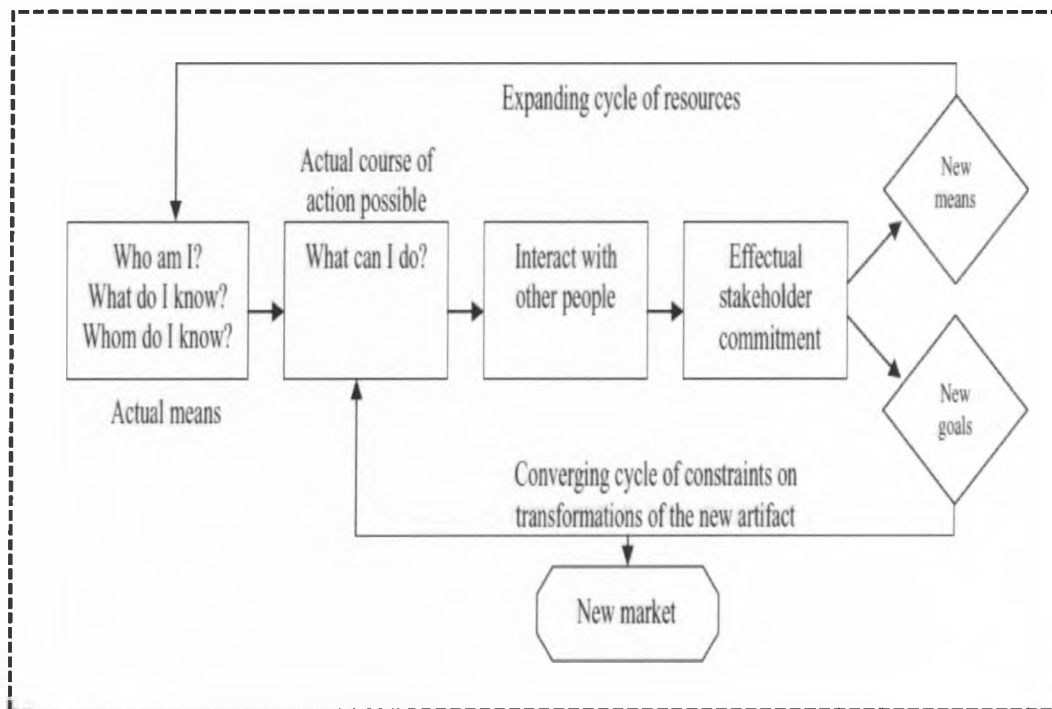


Figure 4: Effectuation approach to entrepreneurship

Source: Sarasvathy & Dew, 2005 (p. 5)

In this study, effectuation is measured and conceptualised as a multi-dimensional construct with four sub-dimensions: experimentation, affordable loss, flexibility and pre-commitments. The study will leverage measures of effectuation that were validated (Chandler et al., 2011) and will, therefore, contribute to literature through the utilisation of their measures in the examination of the entrepreneurial process.

Table 5 provides a synopsis of the key principles, characteristics and behavioural attributes that define and differentiate effectuation as a theory and decision-making logic.

Table 5: Effectual approach: Key principles and summary of theoretical perspective

PERSPECTIVE	EFFECTUAL APPROACH
The need for predicting the future becomes less relevant when we can control it (Sarasvathy, 2001; Sarasvathy, 2009).	
Reason acting	Means-oriented: Resources-driven approach where available resources and assets dictate the most probable objective and outcome to pursue.
View on risk and resources	Affordable loss: A prudent approach to the pursuit of opportunities. Resources that are committed are limited to what stakeholders can afford to lose in pursuit of an opportunity. The focus is on limiting the downside potential while experimenting with as many approaches as deemed feasible (Sarasvathy, 2001; Read & Sarasvathy, 2005).
Attitude towards outsiders	Partnerships: Entrepreneurs leverage on networks and enter into business alliances to drive the growth of the new venture and manage the risk that comes with an unpredictable future (Sarasvathy, 2001).
Attitudes towards unexpected contingencies	Leveraging: Contingencies are viewed as opportunities. To leverage off such contingencies, the entrepreneur must be agile; constantly rethinking and continuously transforming their idea of the ultimate business venture (Sarasvathy, 2001).
Outlook on the future	Creative: Reliance on short-term experimentation in the identification of future opportunities.

Source: Chandler et al., 2011; Dew, Read, Sarasvathy, & Wiltbank, 2009a; Mthanti, 2013; Read et al., 2009; Sarasvathy, 2001; Reymen et al., 2015.

2.7 CAUSATION: A TRADITIONAL THEORETICAL PERSPECTIVE

The following section provides a detailed analysis of causation as a theory and an entrepreneurial decision-making strategy. The section begins by conceptualising

causation as a decision-making strategy. Causation is then unpacked, and the five principles that support the logic are explained.

2.7.1 Conceptualising causation

Sarasvathy (2001) coined the term causation to describe a grouping of traditional approaches and perspectives that seek to define and explain the process of new venture creation by employing an array of managerial and business management principles and methods of thinking (Duening et al., 2012; Sarasvathy, 2001).

Causation is a logic of prediction which affirms a common view that predicting the future is central to controlling it (Sarasvathy, 2001; Sarasvathy, 2009). Fundamental to causation is reliance on the application of rational processes by entrepreneurs when detecting entrepreneurial opportunities. The results of these rational processes form the basis on which entrepreneurs identify entrepreneurial opportunities and conduct further analysis on these opportunities (Chandler et al., 2007; Sarasvathy, 2001).

Entrepreneurs applying causation as a model of entrepreneurship identify a specific outcome or opportunity and subsequent to identification of this outcome, the entrepreneur engages in a process of collecting resources required to achieve this preconceived or predetermined outcome and ultimately to obtain a competitive advantage (Chandler et al., 2011; Perry et al., 2012; Sarasvathy, 2001; Sarasvathy, 2009).

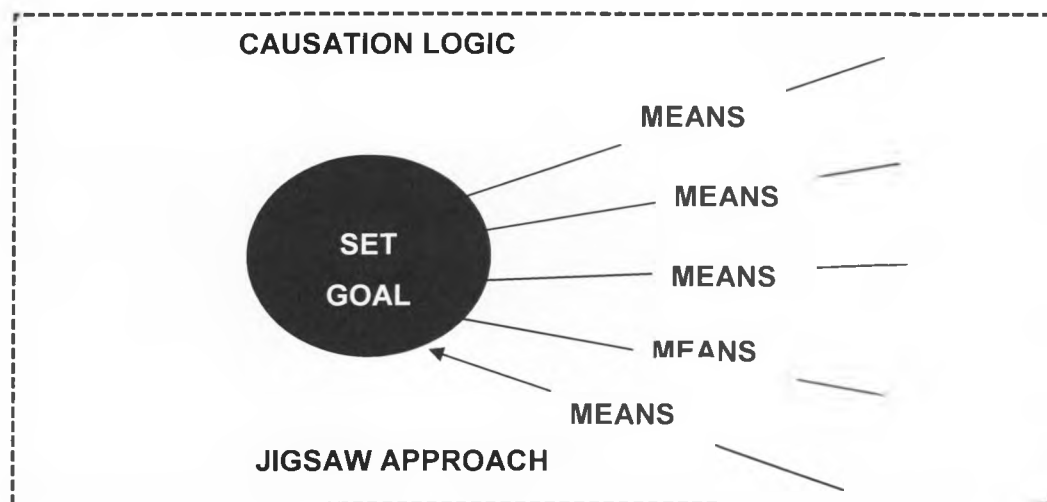


Figure 5: An illustration of the relationship between goals and resources (means) when applying the causation model.

Source: Adapted from Society for Effectuation Action (2017). Retrieved 28 May 2017 from http://www.effectuation.org/?page_id=20

Causation relies on predictive strategies and views the future as an extension of the past. It is highly dependent on extensive planning and analysis of results that are produced by these predictive instruments, and therefore they form central mechanisms in the management, mitigation and control of risk (Sarasvathy, 2001; Sarasvathy, 2009; Wiltbank, Sudek & Read, 2009). As causation is grounded on the assumption that the distribution of outcomes can be predicted through the use of statistical calculations and prediction instruments, it was therefore cited by Sarasvathy (2001) as an unsuitable strategy to apply in environments that are characterised by Knightian uncertainty (Chandler et al., 2007; Sarasvathy, 2001; Sarasvathy, 2009).

The causation model is an effect-dependent approach to new venture creation and firmly aligns itself with a school of thought that affirms that opportunities exist within the environment but require alert entrepreneurs to identify and eventually discover and exploit them (Fisher, 2012; Read et al., 2009; Sarasvathy, 2001; Sarasvathy, 2009; Shane & Venkataraman, 2000; Urban & Heydenrych, 2015).

The model is represented by a systematic and structured approach that is focused on a predetermined objective. The process is initiated by an upfront identification of the

end goal and objective of the venture. All action taken after that is geared towards the facilitation and pursuit of that goal (Chandler et al., 2011; Sarasvathy, 2001; Sarasvathy, 2009). These actions include establishing any contributing factors that will facilitate the accomplishment of the objective, gathering the required resources and developing capacity, expertise and capability (Wiltbank et al., 2009).

Typically, an entrepreneur applying the causation model would initiate the process of new venture creation through an assessment of the environment and an analysis of the opportunities that exist within that environment. Once this process has been completed, and an opportunity has been identified, an entrepreneur is then in a position to conduct target market analysis, whereby they will identify and analyse the needs of the specified target market. This is followed by developing a business plan and collating resources that will be used in the creation of the new venture. Every course of action that is taken by an entrepreneur in the process described above is informed by an effort to maximise the return on the investment that will ensue from taking that course of action or pursuing that entrepreneurial opportunity (Chandler et al., 2007; Sarasvathy, 2001).

Sarasvathy (2001) proposed principles that capture the essence of causation logic. These have been interrogated, developed and revisited by the author and multiple scholars over the years as the profile of effectuation has increased. These principles begin with a given goal, concentrating on expected returns, emphasising competitive analysis, exploiting pre-existing knowledge and trying to predict a risky future.

The next subsection will unpack and explain each behavioural principle associated with causation.

2.7.2 Concentrating on expected returns

Causation models view the task of new venture creation as a process that is intrinsically aligned to the maximisation of expected returns. Therefore, maximisation of returns forms the basis of every action taken by an entrepreneur. Every opportunity pursued by the entrepreneur is pursued with a clear focus on the upside potential (Dew et al., 2009a; Sarasvathy, 2001; Sarasvathy, 2009).

When utilising the causation model, entrepreneurs commit the required resources in pursuit of a predefined opportunity. They generate suitable strategies that will result in the highest level of success (Sarasvathy, 2001).

2.7.3 Emphasising competitive analysis

Causation models view outsiders as competitors. Relationships are driven and guided by extensive market research and competitive analyses and these form the foundation upon which entrepreneurs construct a competitive advantage. Entrepreneurs who utilise causation models apply strategies whereby they protect and retain information and knowledge from outsiders (Sarasvathy, 2001; Sarasvathy, 2009).

2.7.4 Exploiting pre-existing knowledge

Causation models leverage and exploit knowledge and expertise that are already in existence and can be utilised by the entrepreneur to obtain a competitive advantage (Sarasvathy, 2011).

2.7.5 Trying to predict a risky future

At the core of causation models is the belief that predicting the future is central to controlling it. Causation models are dependent on predictive strategies and view the future as an extension of the past, therefore firmly focusing on the aspects of an uncertain future that can be predicted through prediction instruments (Sarasvathy, 2001; Sarasvathy, 2009).

Figure 6 provides an illustrative process flow applied when utilising the causal approach to entrepreneurship.

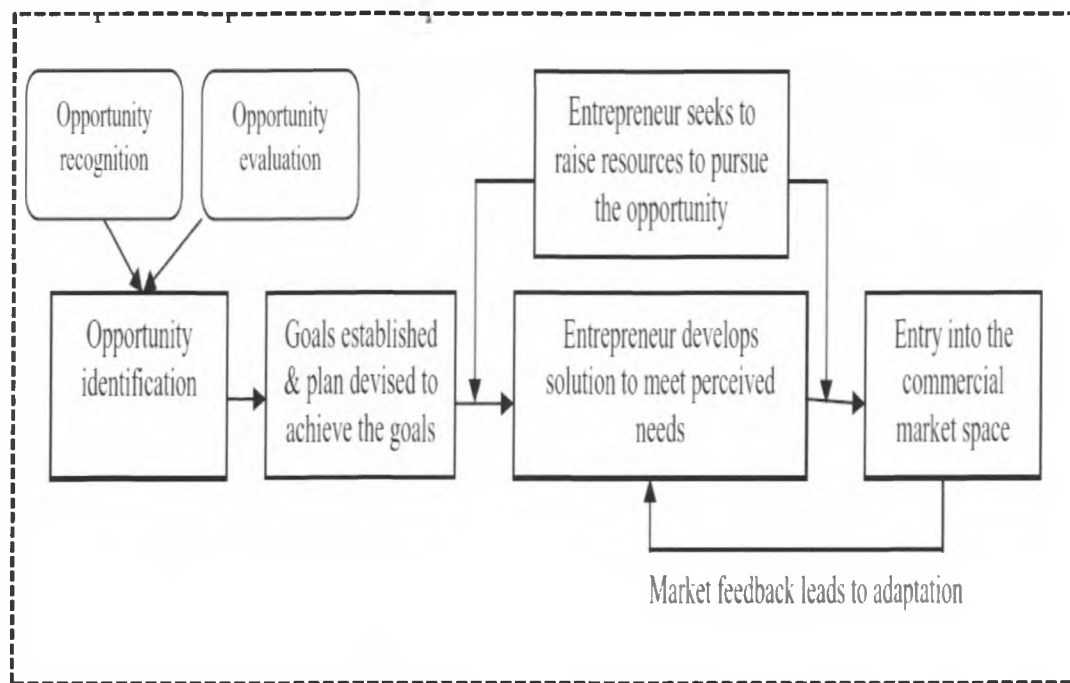


Figure 6: Causation approach to entrepreneurship

Source: Fisher, 2012 (p. 1024)

The key elements captured in Figure 6 will be unpacked and expanded upon in the section below.

2.7.6 Entrepreneurial opportunities

Historically, research in entrepreneurship has mainly focused on the individual entrepreneur and considered the act of entrepreneurship as a consequence of the action of the individual participating in entrepreneurial activity. This has resulted in the neglect of the role of opportunities in the entrepreneurial process (Eckhardt & Shane, 2003; Read et al., 2009; Shane & Venkataraman, 2000).

Entrepreneurial opportunities are defined as the creation and introduction of new goods, services, raw materials, markets, and processes as a result of the formulation of new methods of creation or production that result in a new output (Eckhardt & Shane, 2003).

Eckhart and Shane (2003), through their review of entrepreneurship literature, identify three methods of classifying entrepreneurial opportunities; namely, centre of changes, sources of opportunities and the originator of the change.

a. Centre of changes:

The authors assert that entrepreneurial opportunities are not limited only to the introduction of new products and services, they can also be revealed through disruption to other parts of the entrepreneurial value chain. Entrepreneurial opportunities manifest through various streams, such as:

- the creation and introduction of innovative products and the delivery of innovative service;
- the identification of new markets around the world that can be exploited to generate value;
- unearthing and creating new raw materials that are used to create outputs;
- formulation of new methods of creation or production that result in a new output; and
- identification of innovative methods of structuring and organising to increase efficiency and create additional value.

(Eckhardt & Shane, 2003; Schumpeter, 1934)

b. Sources of opportunities:

Opportunities can be differentiated based on their foundation or point of origin. Through their review of literature, Eckhardt and Shane (2003) identify and classify the primary classifications for sources of opportunities. Key elements are discussed below:

- **Changes in supply and demand:** Opportunities are generated from both changes of supply (enhanced methods of production, organisation and the development of efficient processes) and demand (the changes in what customers want and their tastes create opportunities for entrepreneurs to fulfil customer needs).
- **Improved productivity versus generation of wealth:** Productivity-enhancing sources of entrepreneurship are those that stem from a desire by entrepreneurs to increase efficiencies. Rent-seeking sources of entrepreneurial opportunities are those that stem from a desire for self-enrichment (Baumol, 1993 as cited in Eckhardt & Shane, 2003).

- **Irregular information:** Information asymmetry refers to a state of disruption of the status quo, alteration or modification of factors within and outside the entrepreneurial value chain that result in a disturbance and a re-evaluation of the current way of doing things. It is within this disturbance that entrepreneurship opportunities occur whereby entrepreneurs who are first to access this new information are able to take advantage of the transitional state by accessing raw materials at lower prices, creating innovative and cost-effective products and therefore deriving the highest value. Competing schools of thought believe that opportunities exist regardless of new information. The belief is that information is inherently dynamic, and therefore because of constant change and evolution, it is not always correct. Entrepreneurs who utilise new information are therefore prone to making errors based on this information, which creates an imbalance in supply and demand. Other entrepreneurs who are aware of this imbalance can take advantage of this situation (Eckhardt & Shane, 2003).

c. Creator of change:

The originator of change was identified as the participant who is responsible for the disruption that causes the manifestation of an opportunity. Key actors were identified as entities, governments, suppliers, customers and new entrants into the market (Klevorick, Levin, Nelson & Winter, 1995 as cited in Eckhardt & Shane, 2003).

2.7.7 Opportunity recognition

Shane and Venkataraman (2000) contend that opportunity recognition is a subjective process, meaning it is dependent on the individual entrepreneur to identify an opportunity. They identify two key contributors towards the ability of individuals to identify opportunities; namely, information learnt previously by the individual that allows them to take advantage of an opportunity and a mental state and intuition of the

individual that allows them to leverage information and take advantage of opportunities.

2.7.8 Opportunity evaluation

The decision by an entrepreneur to pursue an opportunity that has been identified is primarily driven by the type of opportunity that the entrepreneur has identified and the character of the individual entrepreneur (Shane & Venkataraman, 2000).

In order to decide to pursue an opportunity, the nature of the opportunity has to be appealing to the entrepreneur. The entrepreneur must believe that they have an opportunity to generate sufficient value from pursuing such an opportunity. The value expected to be garnered must be perceived by the entrepreneur to have the possibility of exceeding the resources that will be committed to the venture. This is referred to as the nature of the opportunity (Schumpeter, 1934; Kirzner, 1973; as cited in Shane & Venkataraman, 2000).

The belief that sufficient value can be generated from the exploitation of a recognised opportunity is not enough to ensure that all entrepreneurs will pursue that opportunity. Often entrepreneurs weigh the projected benefits that they will gain from pursuing an entrepreneurial opportunity against benefits that they could accrue elsewhere by taking an alternative action, referred to as the opportunity cost (Shane & Venkataraman, 2000).

Another factor that sways the exploit or not decision is the skills and expertise at the disposal of the entrepreneur, meaning that if an entrepreneur has already been exposed to the key skills required to successfully pursue an opportunity, they are more likely to pursue that opportunity. The entrepreneur's inclination (or lack thereof) to risk taking and the availability of resources are central to the pursuit and exploitation of opportunities. These are all considered based on the character of the individual (Shane & Venkataraman, 2000).

Table 5 provides a synopsis of the key principles, characteristics and behavioural attributes that define and differentiate causation as a theory and decision-making logic.

Table 5: Key differentiating principles and summary of theoretical perspective: Causation approach

PERSPECTIVE	CAUSATION APPROACH
Predicting the future is central to controlling it (Sarasvathy, 2001)	
Reason acting	Goal-oriented: Objective driven approach where the objective or outcome is predetermined and the resources required to pursue the objective are collected subsequently (Sarasvathy, 2001).
View on risk and resources	Expected return: Entrepreneurs commit the required resources in pursuit of a predefined opportunity. They generate suitable strategies that will result in the highest level of success. The focus is on increasing upside potential (Sarasvathy, 2001).
Attitude towards outsiders	Competitive analysis: Entrepreneurs employing this logic view outsiders as competitors. Relationships are driven and guided by competitive analyses and obtaining a competitive advantage (Sarasvathy, 2001).
Attitudes towards unexpected Contingencies	Avoiding: Total avoidance of contingencies. Complete reliance on the accuracy of predictive instruments, planning and achievement of predetermined targets (Sarasvathy, 2001).
Outlook on the future	Predictive: Views the future as an extension of the past. This approach, therefore, necessitates the use of prediction mechanisms (Sarasvathy, 2001).

Source: Chandler et al., 2011; Dew et al., 2009a; Mthanti, 2013; Read et al., 2009; Reymen et al., 2015; Sarasvathy, 2001.

In this study, effectuation is measured and conceptualised as a unidimensional construct. The research study will, therefore, leverage measures of effectuation that were validated and therefore contribute to literature through the utilisation of their measures in the examination of the entrepreneurial process (Chandler et al., 2011).

2.7.9 Overview of causation and effectuation entrepreneurial theories

Fisher (2012) analysed and broke down the various elements of causation and effectuation from a theoretical perspective. Table 6 provides a summary and an opportunity to recap on the principles that define and differentiate causation and effectuation.

Table 6: Overview of causation and effectuation approaches

ELEMENTS	CAUSATION APPROACH	EFFECTUAL APPROACH
Variables, constructs, concepts	Objective-driven approach where the outcome is predetermined and the resources required to pursue said objective are collected subsequently. Typical causation process: 1. Define the outcome or objective 2. Forecast the Return on Investment 3. Analyse competitive environment 4. Predicting the future and therefore controlling it.	Resources-driven approach where available resources and assets dictate the most probably objective and outcome to pursue. Typical effectuation process: 1. Define the means/resources at the disposal of the entrepreneur. 2. Affordable loss: Resources commitment limited to what stakeholders can afford to lose in pursuit of an opportunity. 3. Partnerships: Leverage on networks and enter into business alliances to drive the growth of the new venture and manage the risk that comes with an unpredictable future. 4. Leveraging: Contingencies are viewed as opportunities. Agility, constant rethinking and continuous transformation.
Relationship between opportunity and uncertainty	Opportunity identification and exploitation are typically conducted in existing markets where levels of uncertainty are lower.	Opportunity identification and exploitation are typically conducted in new markets where levels of uncertainty are higher with a view of exploiting first-to-market of early entrant advantages while managing the

ELEMENTS	CAUSATION APPROACH	EFFECTUAL APPROACH
		risk through a prudent resource commitment and management strategy.
Decision	Predictive: Views the future as an extension of the past. This approach, therefore, necessitates the use of prediction mechanisms, which include information gathering and analysis.	Creative: Reliance on short-term experimentation and the identification of future opportunities.

Source: Fisher, 2012; Sarasvathy, 2001; Sarasvathy, 2009.

2.8 VENTURE PERFORMANCE AND GROWTH MEASURES

Organisational and venture performance is a key dependent variable in management research. The primary reason for the importance of this construct is that it is central to the measurement of the survival and failure of ventures (Richard et al., 2009). The importance of this dependent variable is outlined in the following observation by Richard et al. (2009):

“Measuring it is essential in allowing researchers and managers to evaluate the specific actions of firms and managers, where firms stand vis-à-vis their rivals, and how firms evolve and perform over time. Its importance as the ultimate evaluative criterion is reflected in its pervasive use as a dependent variable” (p. 719).

Even though venture performance is a key construct in management research, there is still a distinct lack of consistency in the various studies in how the construct is defined and ultimately measured (Gerba & Viswanadham, 2016; Read et al., 2009; Richard et al., 2009). In an assessment of research papers that included a measure of the construct, Richard et al. (2009) established that out of 213 research papers reviewed that included performance as a variable, 207 different measures of performance were utilised by the researchers.

This, of course, has a downstream and longer-lasting impact as it hampers the comparability of research findings. Measuring the performance of small and medium ventures is considered to be even more challenging when compared to the measurement of more established enterprises; this is because of the multi-dimensional and multi-faceted nature of the measure and the distinct lack of a generally accepted universal measure that measures small venture performance (Gerba & Viswanadham, 2016; Read et al., 2009).

2.8.1 Objective measures of organisational performance

The multi-dimensional nature of measurements for venture performance includes objective and subjective measures of venture performance. The section below will briefly expand on the classifications of venture performance.

Objective measures of organisational performance are those measures reported and captured utilising accounting and financial market measures. Accounting measures are the most common and the traditional method of evaluating and assessing organisational performance (Richard et al., 2009). Table 7 provides a summary of key accounting measures for venture performance.

Table 7: Accounting measures of performance

Accounting Measure	Description of Measure
Sales	Revenue generated by the organisation through the sale of goods and service.
Sales growth	Percentage change of sales period to period.
Market share	Current revenue generated by the firm in the market divided by the total value the revenue generated by all players in that market and expressed as a percentage.
Profit margin	Net operating profit/sales.
Return on Assets (ROA)	Net profit divided/shareholder's equity.
Return on Investment (ROI)	Net operating profit /book value of assets.

Source: Richard et al., 2009

2.8.2 Subjective measures of organisational performance

Subjective measures of performance are designed to derive a view of the performance of a venture by asking key individuals within organisations about the performance of the venture (Richard et al., 2009). These measures are divided into two subcategories; namely, fully subjective measures and quasi-objective measures.

- In assessing subjective measures of performance, Richard et al. (2009) assert that:

“Fully subjective self-report measures allow researchers to address latent performance constructs directly. Instead of asking for opinions on some objective measure, as in the case of quasi-objective measures, fully subjective self-report questions assess the underlying performance construct itself” (p. 736).

When utilising subjective measures of performance, researchers attempt to determine the performance of an organisation by asking the respondents to benchmark their organisational performance against that of a competitor or, alternatively, respondents could be asked to assess their organisation's performance against how they expected the organisation to perform (Richard et al., 2009).

The benefits of using subjective measures of performance lie in the flexibility of the measures. This affords the researchers the ability to tailor the questions to measure and address components of organisational performance directly (Richard et al., 2009). There are, however, drawbacks to utilising subjective measures of performance; these include the comparative and subjective nature of these measures that expose them to unreliability, as they are purely reliant on the responses of individuals. This is further exacerbated by the fact that respondents could suffer from recall bias (the inability of a respondent to accurately recollect what they were thinking at the time due to the passing of time) or they could inadvertently inflate or deflate organisational performance in their responses (Richard et al., 2009).

- When utilising quasi-objective measures of performance, a researcher will request that a respondent responds on venture performance by asking them to relate their venture performance to objective financial measures of performance. Typically, a researcher would request a respondent to rate their venture's performance when compared with competitor's venture performances, such as sales growth, revenue growth and net profit margin (Richard et al., 2009; Wiklund & Shepherd, 2003).

It is, however, incumbent on the researcher to evaluate the suitability of the use of subjective and objective measures of performance dependent on the context of their research study.

2.8.3 Defining venture performance

In defining venture performance, the research study ascribes to the view and deduction made by various scholars that small venture performance, small venture growth and small venture success are indistinguishable measures and are therefore

assumed to be synonymous in measuring the development of small ventures (Gerba & Viswanadham, 2016; Wiklund & Shepherd, 2005). The synonymy lies in the use of similar indicators to measure venture performance, growth and success. The most common of these indicators include objective indicators sales growth, return on investment and subjective indicators, such as the number of employees (Gerba & Viswanadham, 2016; Wiklund & Shepherd, 2005). This view is supported by Wiklund and Shepherd (2005) who, in their research, identified multiple studies that utilised venture growth as a proxy or representation of venture performance. They also identify that in the context of small ventures “growth as a measure of performance may be more accurate and accessible than accounting measures of financial performance” (p. 80)

Therefore, in defining venture performance for the purposes of this research paper, we leverage off the definition that was put forward by Sandberg (2003), who defines small venture performance as “the ability of small businesses to contribute to job and wealth creation through business start-up, survival, and growth” (p. 409).

This is the definition that will be adopted as the definition for venture performance in this study. The definition is consistent with views of South Africa's aspirational and guiding document, the NDP. This document views entrepreneurs and entrepreneurial ventures as the primary actors and agents of change in the reduction of unemployment to 6% by 2030 (unemployment was measured at a fourteen-year high of 27.7% in Quarter 2: 2017) (Statistics South Africa, 2017).

This will be achieved primarily through the stimulation and development of SMMEs, which are predicted by the NDP to contribute 90% of all new jobs created in this country by 2030. SMMEs are also predicted to contribute towards the progressive growth of the economy, in part through the contribution of sustainable SMMEs (National Planning Commission, 2011; SAICA, 2016; Statistics South Africa, 2017). The definition is particularly fitting in the context of South Africa, which continues to suffer from structural unemployment and very low growth in employment.

2.8.4 Operationalising venture performance

The research paper, therefore, operationalises small venture performance as a commonly used measure of growth: this is the number of full-time and part-time people employed by the firm. Employment growth, the dependent variable, was operationalised as the relative growth in employment in terms of an increase in the number of full-time and part-time employees over a three-year period.

The study adopts the definition presented by the Organisation for Economic Co-operation and Development (OECD) for high-growth firms as the base measure for positive firm performance through employment growth (Chidakwa, 2016).

They defined a high-growth firm as an organisation with an "average annualised growth in employees or turnover of at least 20% per annum over a three-year period" (Eurostat-OECD, 2007, p. 61).

All firms that are deemed to have a higher annualised growth based on the responses will be assumed to be performing positively.

There are positives and negatives to using employment growth as the sole measure of performance. The positives have been identified as the fact that employment growth is indicative of the development of the venture through an increase in the members that make up the venture. Human capital or employment growth, as previously mentioned, has been identified as a proxy for venture performance and growth and, lastly, employment growth is not as intrinsically tied to the commercial activities of the firm as sales growth. The negatives have been identified because employee growth is sometimes not the best indicator of profitability and therefore may need to be considered with other indicators (Vrontis & Rossi, 2016).

2.9 RESEARCH QUESTION/HYPOTHESIS DISCUSSION

In the section below the research question will be reintroduced and the hypotheses will be discussed in detail.

2.10 RESEARCH QUESTION

The following research question will be addressed in the study:

2.10.1 Main research question

Does the decision by the entrepreneur to utilise effectual or a causation decision-making strategies at start-up impact the performance of nascent and new entrepreneurship ventures?

2.11 HYPOTHESIS DEVELOPMENT

2.11.1 Effectuation and venture performance

Effectuation was initially introduced worldwide in 2001 as an emerging theory. The theory has captured the imagination of scholars as it proposes an alternative method, process and strategy that entrepreneurs can follow in instances where the traditional methods, such as the causation approach are not suitable (Perry et al., 2012).

Over the years there has been an increase in research studies that include effectuation as a variable in the study (Read et al., 2009). This has therefore answered the initial observations raised by Perry et al. (2012) and Read et al. (2009), who noted moderate to slow progress in the development of effectuation research and determined that effectuation research is still very much in its infancy.

The next phase in the development of the theory was identified as a need to assess and explore the relationship between effectuation and established constructs such as performance. (Perry et al., 2012; Read et al., 2009; Urban & Heydenrych, 2015). The establishment of measures for effectuation has assisted progress in the exploration by scholars of the relationship between effectuation and performance. Studies conducted on this topic have produced differing conclusions:

- Read et al. (2009) contributed to effectuation literature by conducting a meta-analysis of prominent research studies conducted on the subject of effectuation. The authors attempted to determine the relationship between effectuation and the performance of new ventures. They hypothesized that based on the fact that effectuation reflects the heuristics of expert entrepreneurs there would be a positive relationship between effectual approaches and new venture performance. Figure 7 represents the model put forward to support this hypothesis.

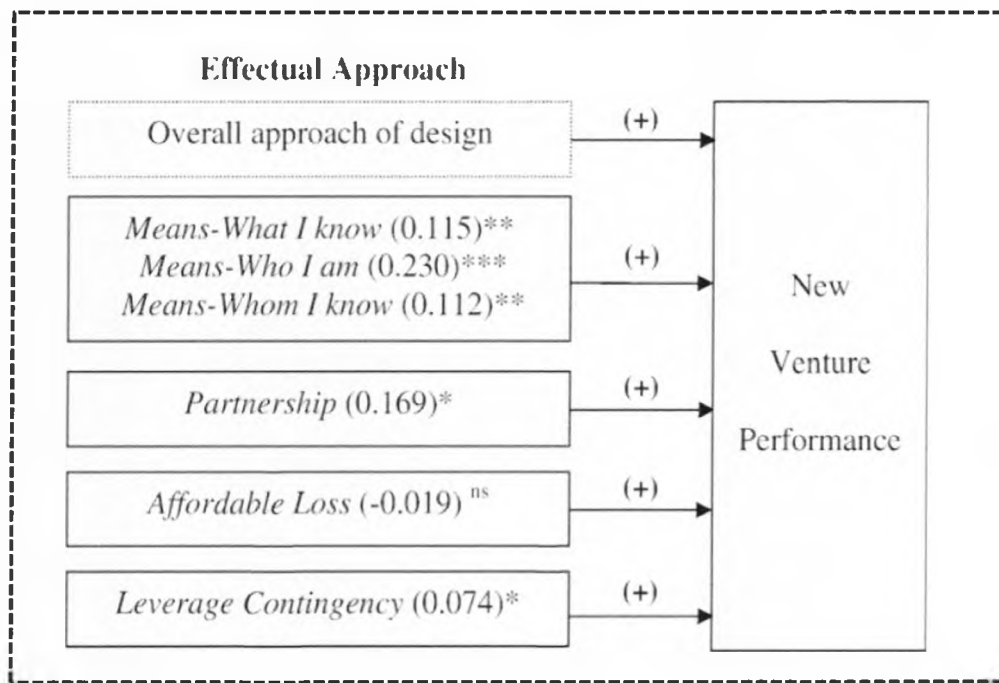


Figure 7: Theoretical model of an effectual approach on new venture performance

Source: Read et al., 2009 (p. 577)

The meta-analytical study looked at data from 9 897 new ventures, and they concluded that there is indeed evidence of a positive relationship between effectual and new venture performance. They could not, however, conclude on the relationship of affordable loss, which is a sub-dimension of effectuation, and venture performance.

- Rust (2011) conducted a research study that focused on nascent entrepreneurship ventures in the United States of America and then focused on those operating in dynamic industries. The objective of the research was to ascertain whether the decision by entrepreneurs to utilise causation or effectuation decision-making processes influenced the survival of ventures in a dynamic industry. The author determined that there are no purely causal or effectual ventures, as entrepreneurs tend to use a blend of the two logics. Rust (2011) concluded that neither approach is a definite predictor of sustained venture performance; however, he further concluded that the causation approach improves the probability of sustained venture performance by 10% (23%–33%) when compared to the effectual approach.
- Urban and Heydenrych (2015) assessed the relationship between effectuation logic, technological orientation and venture performance, limited to the renewable energy sector in South Africa. The authors established that only three dimensions of effectuation (pre-commitment, experimentation and flexibility) had a significant positive impact on performance.
- Chidakwa (2016) used causation and effectual decision-making models to assess the entrepreneurial processes of high growth ventures in Zimbabwe. The author concluded that the characteristics and principles of effectuation decision-making are utilised by high growth ventures in emerging markets.
- Salamon (2016) assessed the extent to which the application of causation or effectual decision-making strategies by German entrepreneurs at the business start-up phase influence the ultimate success of the venture. The author could not conclusively determine whether the use of causation or effectuation provided an entrepreneur with an advantage in the process of creating a successful venture.
- Cai, Guo, Fei and Liu (2017) in their study of the effect of effectuation on the performance of 266 ventures in transitional economy China determined that effectuation has a positive effect on new venture performance.

Sarasvathy (2001) identified that when dealing with an unpredictable future, expert entrepreneurs embarked on a process of experimentation and iterative learning. This allowed them to obtain feedback from the market and through that feedback, they could unearth the underlying distribution of the future. This process is synonymous

with effectuation and therefore informs our hypothesis that in the emerging market of South Africa, where the new venture mortality rate is chronically high and therefore indicative of an environment where the future cannot be managed through prediction, and synonymous with environments characterised by Knightian uncertainty, effectuation is a suitable alternative to causation.

Hypothesis 1:

Alternate Hypothesis 1: There is a positive relationship between effectual decision-making strategies and venture performance.

Null Hypothesis 1: There is no relationship between effectual decision-making strategies and venture performance.

Chandler et al. (2011), determined that effectuation is a formative, multi-dimensional construct with four sub-dimensions; namely, affordable loss, pre-commitments, flexibility and experimentation. The research report, therefore, extends the main hypothesis as follows:

a) **Alternative Hypothesis 1a:** There is a positive relationship between **affordable loss** and venture performance.

Null Hypothesis 1a: There is no relationship between **affordable loss** and venture performance.

b) **Alternative Hypothesis 1b:** There is a positive relationship between **pre-commitment** and venture performance.

Null Hypothesis 1b: There is no relationship between **pre-commitment** and venture performance.

c) **Alternative Hypothesis 1c:** There is a positive relationship between **flexibility** and venture performance.

Null Hypothesis 1c: There is no relationship between **flexibility** and venture performance.

d) **Alternative Hypothesis 1d:** There is a positive relationship between **experimentation** and venture performance.

Null Hypothesis 1d: There is no relationship between **experimentation** and venture performance.

2.11.2 Causation and venture performance

Hypothesis 2:

As causation is grounded on the assumption that the distribution of outcomes can be predicted through the use of statistical calculations and prediction instruments, this was therefore cited by Sarasvathy (2001) as an unsuitable strategy to apply in environments that are characterised by Knightian uncertainty (Chandler et al., 2007; Sarasvathy, 2001; Sarasvathy, 2009; Wiltbank al., 2009). This, therefore, informs the hypothesis that in emerging market South Africa, where the new venture mortality rate is chronically high and is indicative of an environment where the future cannot be managed through prediction and is therefore synonymous with Knightian uncertainty. Causation is not a suitable alternative to effectuation.

Alternative Hypothesis 2: There is a negative relationship between causation decision-making strategies and venture performance.

Null Hypothesis 2: There is no relationship between causation decision-making strategies and venture performance.

2.12 CONCLUSION OF LITERATURE REVIEW

Effectuation proposes this paradigm shift from the traditional causation model. However, as already noted by Sarasvathy (2001), effectuation is not meant to displace causation. Sarasvathy underpins the importance of both logics as tools available for an entrepreneur to utilise, depending on the context and the actions that are required

to be taken by the entrepreneur. This allows for agility in the application of the alternative logics, with the possibility of applying both logics simultaneously or a different logic at a different phase of the venture as the context and profile of the venture changes (Alvarez & Barney, 2005; Sarasvathy, 2001; Sarasvathy, 2009).

Read et al. (2009) hypothesis that based on the fact that effectuation reflects the heuristics of expert entrepreneurs there would be a positive relationship between effectual approaches and new venture performance. They concluded that there is indeed evidence of a positive relationship between effectual and new venture performance. Urban and Heydenrych (2015) assessed the relationship between effectuation logic, technological orientation and venture performance. They established that only three dimensions of effectuation (pre-commitment, experimentation and flexibility) had a significant positive impact on performance. Cai, Guo, Fei and Liu (2017) in their study of the effect of effectuation on the performance of 266 ventures in transitional economy China determined that effectuation has a positive effect on new venture performance. These results from previous studies paired with the understanding of effectuation, based on the literature review, therefore inform the research hypothesis which states that, there is a positive relationship between effectual decision-making strategies and all of its sub-dimensions (affordable loss, pre-commitment, flexibility and experimentation) and venture performance.

Causation is grounded on the assumption that the distribution of outcomes can be predicted through the use of statistical calculations and prediction instruments, this was therefore cited by Sarasvathy (2001) as an unsuitable strategy to apply in environments that are characterised by Knightian uncertainty (Chandler et al., 2007; Sarasvathy, 2001; Sarasvathy, 2009; Wiltbank al., 2009). This, therefore, informs the hypothesis that in emerging market South Africa, where the new venture mortality rate is chronically high and is indicative of an environment where the future cannot be managed through prediction and is therefore synonymous with Knightian uncertainty. Causation is not a suitable alternative to effectuation and therefore, there is a negative relationship between causation decision-making strategies and venture performance.

Based on the hypotheses above the following conceptual framework is presented. The conceptual framework utilises the entrepreneurial process as formulated in the GEM. It was then amended to include the hypothesis for this research report.

2.13 Conceptual Framework of Hypotheses

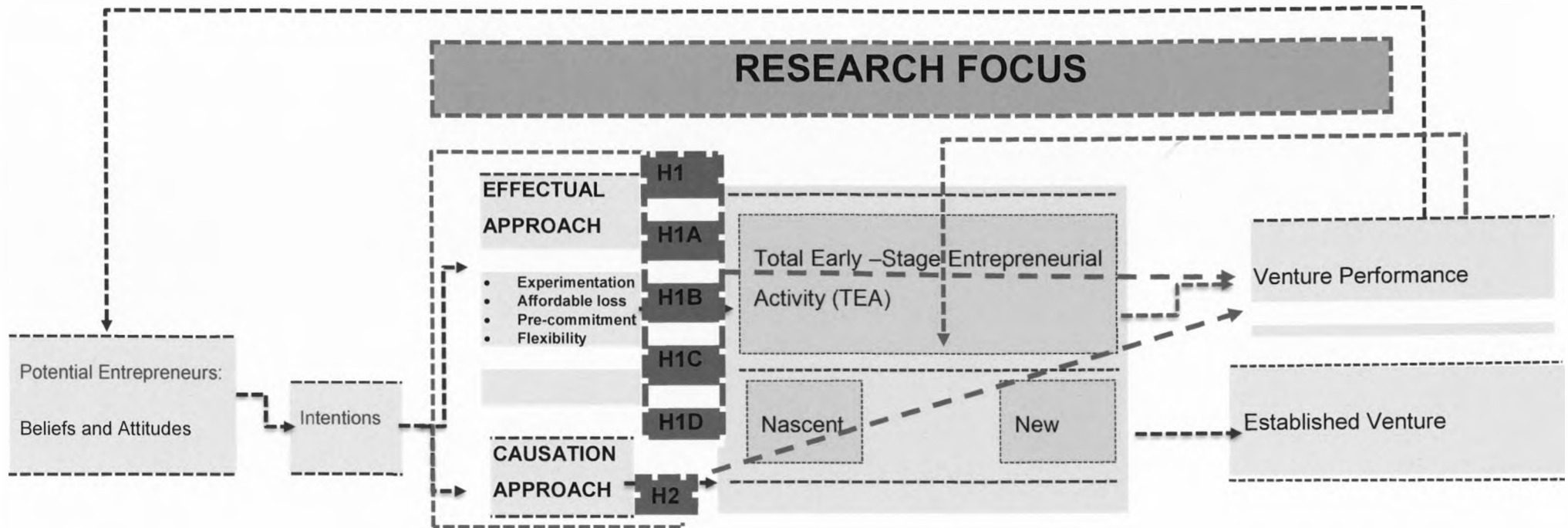


Figure 8 Entrepreneurial Landscape and conceptual framework: Adapted from GEM Global Report 2011

Source: Kelley, Donna, Singer & Herrington, 2012 (p. 5)

CHAPTER 3 : RESEARCH METHODOLOGY

In the previous chapter, a detailed analysis of literature relevant to the study was conducted. The key variables effectuation, causation and venture performance were explained.

The current chapter will outline and discuss the research methodology research and research design that were used for this study. The intended population and preferred sampling method will be described. The research instrument and procedure for data collection and analysis will also be specified.

3.1 RESEARCH METHODOLOGY/PARADIGM

The research study will adopt positivism as the paradigm location for this research study. Positivism is described as a perspective where measurement instruments are utilised to determine and evaluate a cause and effect relationship in an objective manner (Leedy & Ormrod, 2015).

The use of positivism as the paradigmatic location for the research study is in line with the use of validated measures for effectuation and causation. The positivist perspective also supports the use of quantitative research, as it requires a systematic manner of measuring the phenomenon under investigation (Cooper & Schindler, 2014; Leedy & Ormrod, 2015)

The methodological approach is in line with recommendations provided by Perry et al. (2012) and previous studies that have considered a similar subject, such as Heydenrych (2013), Rust (2011) and Salamon (2016).

3.2 RESEARCH DESIGN

The research design outlines the plan that the research study will follow in achieving its purpose and ultimately answering the research question specified in Chapter 2 (Cooper & Schindler, 2014).

A cross-sectional development design was employed in the study. This method allows for the collection of the required data at a point in time (Cooper & Schindler, 2014;

Leedy & Ormrod, 2015). This approach is in line with previous studies that have considered a similar subject, such as Heydenrych (2013), Rust (2011), Salamon (2016) and Urban & Heydenrych (2015). The study will follow a similar approach to that applied by Heydenrych (2013) and Urban and Heydenrych (2015), who selected the firm as the level of analysis as it represents an aggregate of individuals. Similarly, the unit of analysis or participation element was identified as the owner, owner/manager, partner or shareholder of the respondent firms.

The research study used primary survey data that was collected through the use of an online survey (Appendix A). The primary research instrument that was employed was developed and validated by Chandler et al. (2011) and is designed to test the entrepreneur's use of causation logic (a unidimensional construct) and effectuation logic (a multi-dimensional construct), made up of four sub-dimensions; namely, experimentation, affordable loss, pre-commitments and flexibility.

The primary research instrument, as conceived by Chandler et al. (2011), was supplemented by the inclusion of a third construct, venture performance, which is the dependent variable of the research study and therefore necessitates assessment. Wiklund and Shepherd (2003) determined that venture performance is a multi-dimensional construct. For the purpose of this research, the number of part time and full-time employees will be adopted as the sole measure of venture growth and performance.

3.3 POPULATION AND SAMPLE

3.3.1 Target Population

The target population for the research study is nascent entrepreneurial ventures as defined Chapter 1. The study will focus on nascent entrepreneurs, irrespective of the sector or industry in which the entrepreneurial venture is participating. These nascent entrepreneurs will be limited to entrepreneurs who are currently participating or have previously undergone incubation in incubators administered in South Africa. These entrepreneurs will form the primary source of data for the research study. The South Africa Business Incubator Establishment Handbook: A Guide to Establishing Business Incubators in South Africa estimated that there are approximately 105 business incubators distributed across the 9 provinces in South Africa (Department of Trade

and Industry, 2014). It is not possible to estimate the population size of incubatees (businesses who are currently or have previously participated in an incubation programme) because incubators do not share this information about their database of entrepreneurs as a result of legislative and regulatory requirements.

Entrepreneurs who had not participated in an incubation programme but who met the criteria of a nascent entrepreneur as conceptualised in Section 1.7 were accepted.

Table 8: Summary of sample and sampling method

Variable	Description
Target population	Entrepreneurship ventures in South Africa that have been incubated at an incubator administered in South Africa. Entrepreneurs who had not participated in an incubation programme but who met the criteria of a nascent entrepreneur as conceptualised in Section 1.7 were accepted.
Geographical survey	South Africa
Target sample size	Target sample size 150
Sampling unit	Owner/managers, founding members, partners and shareholders
Confidence interval	95%

3.3.2 Sample and sampling method

Non-probability sampling was employed in the research study. The technique was chosen as the technique of choice because of its cost effectiveness, and it is deemed to be less time-consuming than probability. The technique does, however, come with some disadvantages, mainly that the probability of selecting population elements is unknown (Cooper & Schindler, 2014). A combination of judgemental and convenience

sampling was utilised for this study. Judgemental sampling allowed the researcher to ensure that the sample of respondents conformed to the criteria of the nascent entrepreneur as conceptualised in Section 1.7. However, as a result of low responses to the survey, an element of convenience sampling was utilised for the study.

The following reasons are put forward for the use of these techniques:

- As a result of legislative and regulatory requirements incubators do not share information about their database of entrepreneurs. A limited number of incubators (2), were willing to distribute a link or the survey to their database of entrepreneurs; however, they were not willing to divulge the number of participants within each of their databases.
- The response rate to the survey distributed by the participating incubators was particularly poor with less than 20 responses received between November 2017 and December 2017. In January 2018, the participating incubators agreed to redistribute the survey and the response rate improved marginally.
- As a result of the poor response rate convenience sampling was then applied whereby a link to the survey was distributed to entrepreneurs on popular social networks such as LinkedIn. Links to the survey were also distributed directly to entrepreneurs via email. Contact details of those entrepreneurs were obtained through advertising pamphlets distributed by incubators or small business promotional segments on enterprise development and incubator websites.

The process of determining an optimal sample size to support statistical analysis, such as factor and multiple regression analysis, has not been clearly defined and open to contention. This research report will utilise the participant/ variable ratio to determine the sample size (Field, 2013; Galawe, 2017). The research assignment will utilise the rule of thumb of 10 - 15 observations per variable and therefore the targeted 150 should provide a good sample size (Field, 2013; Galawe, 2017).

3.4 THE RESEARCH INSTRUMENT

The research study utilised an online survey to collect data (Appendix A). This method of data collection was considered to be appropriate, and it is recommended by Perry et al. (2012). The survey was distributed to incubated entrepreneurs at small business incubators within South Africa and entrepreneurs who had not participated in an incubation programme but who met the criteria of a nascent entrepreneur as conceptualised in Section 1.7 were accepted.

Chandler et al. (2011) developed, tested and validated scale items for the measurement of effectuation and causation. In developing the measure, the authors aimed to

“...create measures that would allow us to differentiate between start-up processes following a predominant logic of causation vs. those following a predominant logic of effectuation” (Chandler et al., 2011, p. 377).

These will be utilised directly for this study. A seven-point Likert-type scale was utilised with ratings ranging from strongly agree to strongly disagree; this is consistent with the Likert-type scale that was utilised by Heydenrych (2013) and Urban and Heydenrych (2015). Effectuation was identified as a multi-dimensional construct with four sub-dimensions, which have been catered for in the questionnaire. Causation was identified as a unidimensional construct and has been depicted as such in the questionnaire.

As the study is aimed at nascent entrepreneurship ventures subjective, self-reported measures of performance were used to measure venture performance.

Wiklund and Shepherd (2003) identified ten different dimensions of performance including growth in the number of employees. They requested research participants to benchmark their own performance against two of their closest competitors. While Poon, Ainuddin and Junit (2006) in their measurement of venture growth asked top management to rate the performance and growth of the venture against their own expectations, they considered the top manager's perception of the performance of the firm is consistent with actual venture performance.

In this research, the number of employees was utilised as the sole measure of venture growth and performance. Employment growth was operationalised as the relative growth in employment in terms of an increase in the number of full-time and part-time employees over a three-year period. Respondents were asked to provide an indication of growth on a five-item index ranging from 0–10% to over 40%. Venture owners, managers, founding members, partners and shareholders were asked to provide a view on the growth of the venture using this measure.

The online survey was distributed utilising the Qualtrics Survey tool as it allows for extraction of data that is compatible and it is usable on STATA version 14 statistical software that was employed as the statistical analysis tool for the research.

3.4.1 Summary of sections in research instrument

Table 9: Summary of sections in research instrument

Section	Description	Question Number	Source of questions	Psychometric scale type
Introduction to survey	Brief message stating the purpose of the research.	Q1.1	Author	N/A
Consent form	Consent form to be completed by participants providing consent for participation.	Q2.1	Author	N/A
Business background Information	Venture background information required to categorise the business.	Q3.1–3.7	Author	Closed-ended multiple-choice questions
Causation	Questions designed to identify the use of key attributes of causation logic.	Q4.1– 4.8	Chandler et al., 2011	Seven-point Likert scale
Effectuation	Questions designed to identify the use of key attributes of effectuation logic including sub-dimensions: experimentation, affordable loss, flexibility and pre-commitment.	Q5.1–5.13	Chandler et al., 2011	Seven-point Likert scale
Venture performance	Measures of performance.	Q6.2–6.3	Wiklund & Shepherd (2003)	five-item index

3.5 PROCEDURE FOR DATA COLLECTION

The research study used a self-administered online survey as the primary method for the collection of data (Appendix A: Research Survey).

A link to the self-administered online survey was distributed to incubators across the country. The South Africa Business Incubator Establishment Handbook: A Guide to Establishing Business Incubators in South Africa compiled a listing of incubators in South Africa (not meant to be exhaustive list), this was used as a guide for which incubators to contact. Additionally, incubators that were not included on the list were also contacted. The two incubators that committed to distributing the link national footprint and therefore the responses received would have been from business across the various provinces.

The response rate to the survey distributed by the participating incubators was particularly poor with less than 20 responses received between November 2017 and December 2017. In January 2018, the participating incubators agreed to redistribute the survey and the response rate improved marginally.

As a result of the poor response rate a link to the survey was distributed to entrepreneurs on popular social networks such as LinkedIn. Links to the survey were also distributed directly to entrepreneurs via email. Contact details of those entrepreneurs were obtained through advertising pamphlets distributed by incubators or small business promotional segments on enterprise development and incubator websites.

3.6 DATA ANALYSIS AND INTERPRETATION

3.6.1 Descriptive statistics

Descriptive statistics is a method of analysis that is adopted to determine the features, patterns, characteristics and spread of data through the use of summaries about the sample that was utilised (Aljandali, 2016; Cooper & Schindler, 2014).

An initial examination was performed on the raw data received from participants through the use of descriptive statistics. Key measures such as the mean (measures

of central tendency) and standard deviation (measures of dispersion) are presented in the statistical analysis section of the research paper (Aljandali, 2016).

3.6.2 Correlation analysis

Correlation analysis will be used to determine if there is an association between the independent variables causation and effectuation and the dependent variable venture performance.

3.6.3 Exploratory and confirmatory factor analysis

Chandler et al. (2011) used exploratory factor analysis to ascertain the primary dimensionality of the items that were utilised in their questionnaire. An exploratory factor analysis was conducted for the amended survey that was employed for this research paper.

3.7 VALIDITY AND RELIABILITY OF RESEARCH

3.7.1 External validity and internal validity

Chandler et al. (2011) determined that there was adequate evidence for the content, face, predictive and construct validity of the measures of causation and the four sub-constructs of effectuation. Scale validity is situation and sample specific, and therefore an appropriate statistical examination was conducted to assess the research instrument validity as part of the research paper.

3.7.2 Reliability

Chandler et al. (2011) determined that there was adequate evidence supporting the reliability and validity of their measure of causation processes and reliability and validity of sub-components of effectuation. Scale reliability is situation and sample specific, and therefore appropriate statistical examinations were conducted to assess the research instrument reliability as part of the research paper.

3.8 LIMITATIONS OF THE STUDY

The following limitations were identified:

- The research study focused on nascent entrepreneurs in South Africa, irrespective of the sector or industry in which the entrepreneurial venture is participating or intends to participate. Salamon (2016) followed a similar approach in his research study conducted in Germany.
- The research study primarily targeted entrepreneurs who were participating or had previously participated in an incubation programme with incubators administered within the Republic of South Africa. However, with the knowledge that research survey response rates are very low, entrepreneurs who have not participated in an incubation programme but who meet the criteria of a nascent entrepreneur as conceptualised in Section 1.7 were accepted.
- The research study is a cross-sectional study and therefore allows for limited analysis.

CHAPTER 4 : PRESENTATION OF RESULTS

4.1 INTRODUCTION

In the previous chapter, the research methodology and the design adopted for this study were introduced and explained. The intended population and preferred sampling method were described. The research instrument and procedure for data collection and analysis were specified.

The study aims to evaluate the effect of the selection of effectuation or causation decision-making strategies on the performance of nascent entrepreneurship ventures in South Africa. This chapter presents the results of the study. The data, which was obtained from survey respondents, was analysed using STATA version 14 statistical software. Data analysis was conducted in accordance with the research methodology outlined in the previous chapter.

The chapter begins with a description of the sample of respondents and the demographic characteristics of the respondents. This is followed by a review of the results of the tests conducted to determine if the data was normally distributed. The results of an analysis of the internal consistency and reliability are presented and discussed.

The inferential statistics are then presented thereafter the results from the correlation analysis examined. The research hypotheses are described and the data analysis techniques utilised to prove each hypothesis are explained. The study attempts to explain the causes and reasons in instances where the findings of the current study are not consistent with the findings of previous studies.

4.2 DESCRIPTIVE ANALYSIS

A total of 94 survey responses were received. Eighteen (18) respondents did not complete a significant portion of the survey (over 50%) and therefore their responses

were not considered for inclusion in the final analysis. One (1) response was not fully completed; however, a significant portion (52%) of the survey was completed and therefore the responses were considered for inclusion in the study. A total of 76 (n=76) responses were utilised for detailed analysis. The majority of the survey respondents were male with 53 (69.7%) of the 76 respondents. Female respondents made up 23 (30.3%) of the final tally of 76 respondents.

The section below details the demographical breakdown in accordance with the background information section as per the research questionnaire.

4.3 DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS

4.3.1 Demographic characteristics: Age of respondents

Respondents were segmented into six age groups ranging from 18–25 to over 65. Over half (53%) of the total respondents were aged 26–35; almost a quarter (24%) were aged 36–45 and 13% were aged 46–55. Less than 10% were aged 18–25, while less than 5% were aged above 55. Almost a quarter (24.5%) of male respondents and a fifth of female respondents (21.7%) were aged 36–45, while less than 10% of both male (7.6%) and female (8.7%) respondents were aged 18–25. Figure 9 provides a summary of the age profiles of the respondents.

Age of respondents

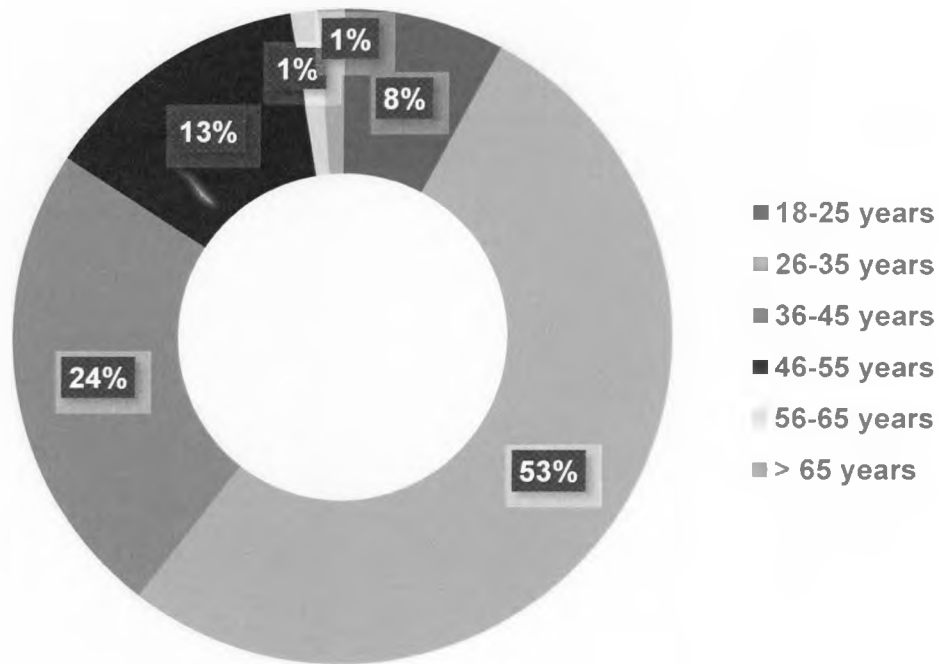


Figure 9: Demographic characteristics: Age of sample

4.3.2 Demographic characteristics: Position in venture

Respondents were asked to state the position that they currently occupy in the venture. Positions were segmented into the categories ranging from manager to shareholder. Over half (59%) of the total respondents were owners of the venture in question, while just over a quarter of the respondents (25%) classified themselves as owner/managers. An equal number of respondents (7%) classified themselves as a shareholder or partner. Only 1% of the respondents occupied the manager position in the firm. Figure 10 provides a summary of the position the respondents occupy in venture.

Position in firm

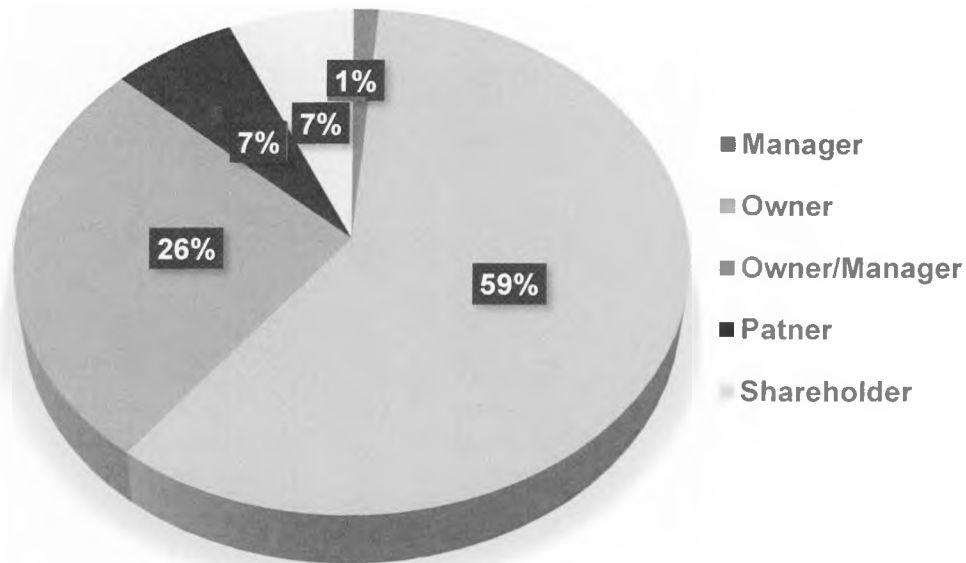


Figure 10: Demographic characteristics: Position in venture

4.3.3 Demographic characteristics: Number of years in business

Venture age was segmented into six categories ranging from less than 1 year to 9 years or more. The majority of the participants (31%) had been in business for approximately 3–4 years, while a quarter (25%) of the research participants had been in business for 1–2 years. Additional analysis of the results revealed 12% had been in business for 5–6 years and an equivalent number of participants had been in business for less than a year. A further 13% of the participants had been in business for 7–8 years and less than a tenth (7%) had been in business for 9 years or more. Figure 11 provides a summary of the number of years that the venture has been operational or in business.

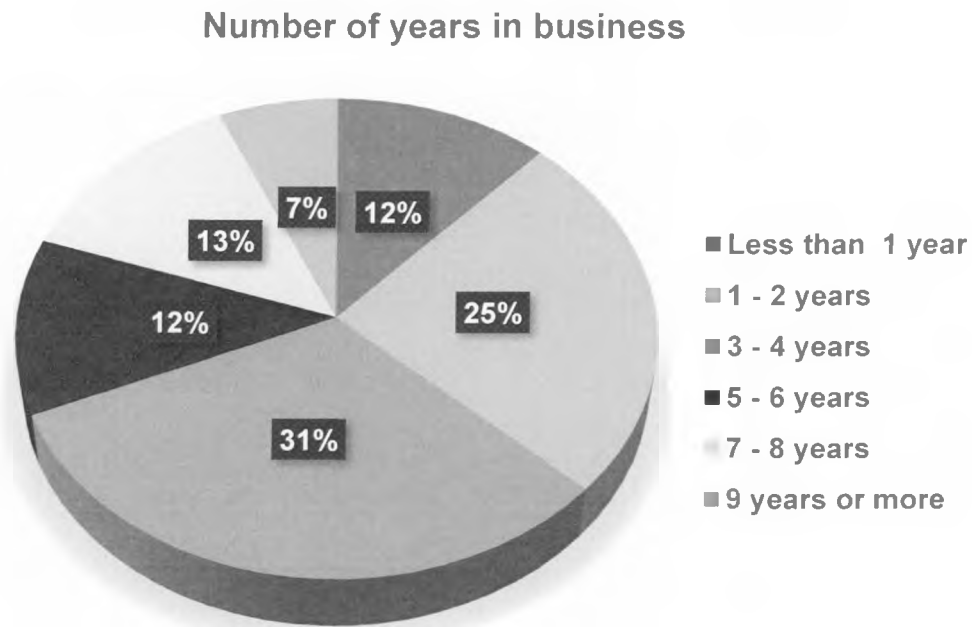


Figure 11: Demographic analysis: Number of years in business

4.3.4 Demographic characteristics: Number of people employed by the business

Responses to the question on the number of people employed by the business were segmented into the six categories ranging from less than less than three to more than 20. Nearly half of the respondents (45%) reported their businesses had less than three employees, while slightly above a third (35.5%) had 4–6 employees. Less than 10% of respondents reported having more than 10–20 employees (9.2%). Six-point six percent of the respondents reported they had more than 20 employees, and 4% reported that they had 7–9 employees. Figure 12 provides a summary of the number of employees that were employed by the venture at the time of survey response.

Number of people employed by the business

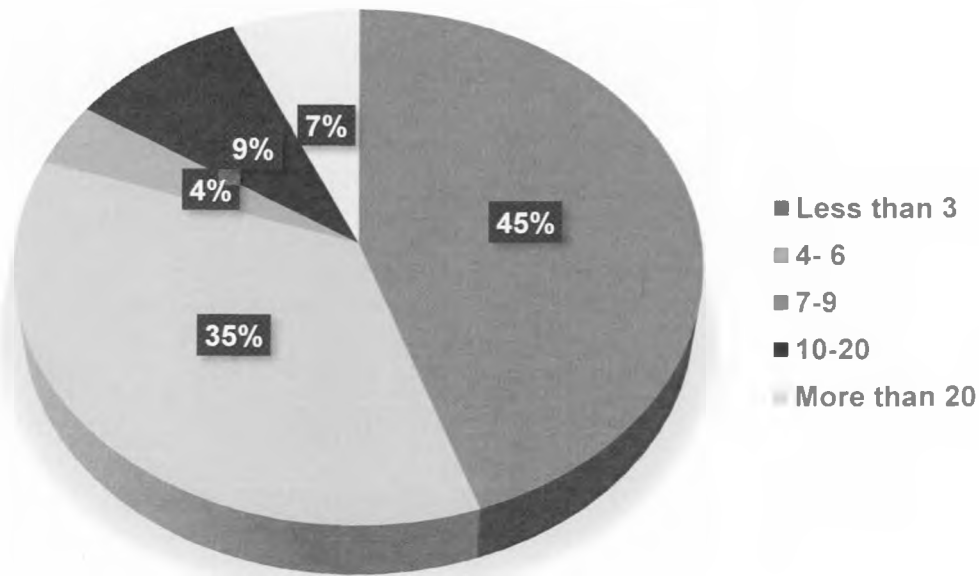


Figure 12: Demographic analysis: Number of people employed by the business

4.3.5 Demographic characteristics: Remuneration costs

Respondents were asked to state the amount of time for which the venture has been able to pay or not been able to pay remuneration costs. Over a third (36%) of respondents stated that the venture had been in a position to pay remuneration costs for three months or more, while just over a quarter (26%) stated that the venture had been in a position to pay remuneration costs for 42 months or more. A minority (13%) of the total respondents stated that the venture had not been in a position to pay remuneration costs for three months or less, while a quarter (25%) of the respondents stated that the venture had not been in a position to pay remuneration costs for three months or more.

Remuneration costs



Figure 13: Demographic analysis: Remuneration costs

4.4 DESCRIPTIVE STATISTICS: NORMAL DISTRIBUTION

Tests for normality calculate the probability that the sample was drawn from a normal population. When testing for normality, probabilities > 0.05 mean the data are normal while probabilities < 0.05 mean the data is not normal (Field, 2013). The data series that does not look normal could lead to misinterpretation of regression analysis. The results produced from the data should, therefore, be interpreted with caution.

4.4.1 Causation: Distribution

The research survey responses for the causation construct range on average between 1 and 5, with a mean of 2.4. The figure below, although almost bell-shaped, does not denote normal distribution. The responses are skewed to the left indicating general disagreement. The large kurtosis is evidence of asymmetrical data distribution.

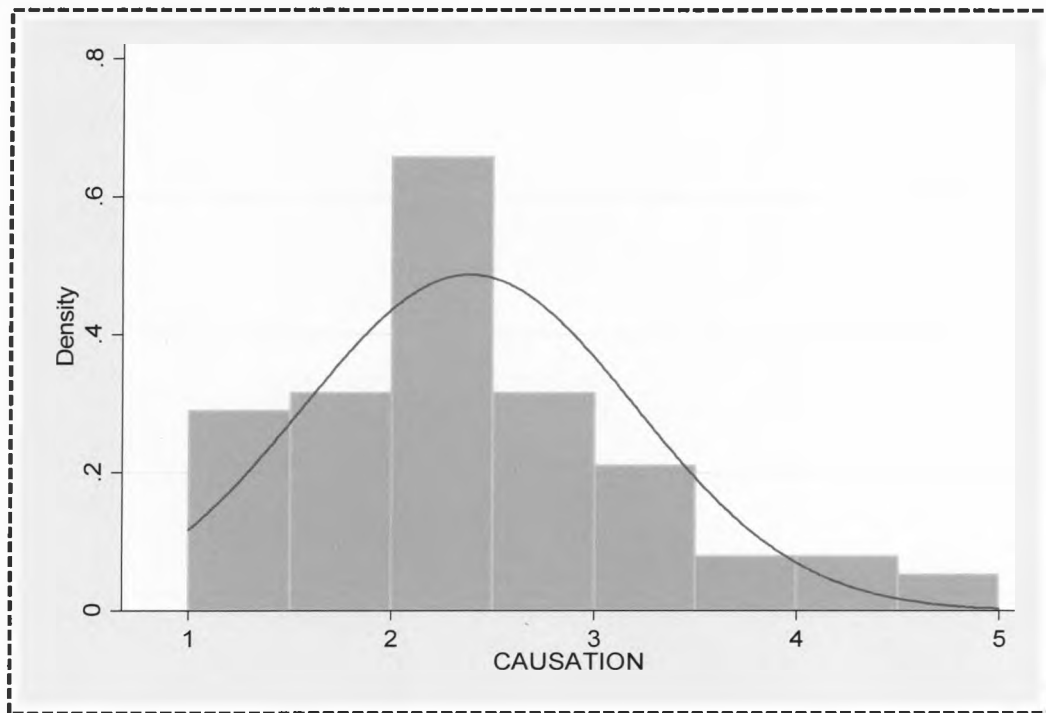


Figure 14: Distribution: Causation

4.4.2 Effectuation: Distribution

The research survey responses for the effectuation construct were, on average, pooled together between the ranges of 1 to 5, with a mean of 2.6 (higher than causation). The data is also skewed towards the left (somewhat disagree), and the asymmetric shape denotes that the data was not normally distributed. The low standard deviation indicates there was not much variation in the responses: responses were heaped towards one side. This means that the inferential models should be interpreted with caution.

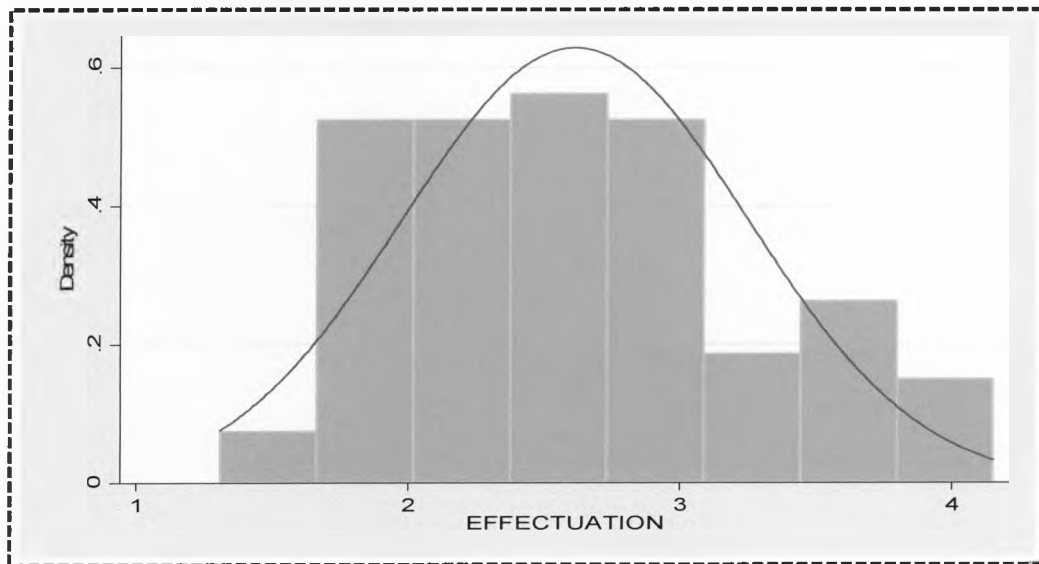


Figure 15: Distribution: Effectuation

4.4.3 Performance: Distribution

The research survey responses for the venture performance construct produced results that were skewed to the left. The majority of the responses lie below the mean (1.8). The non-bell shape denotes that the data was asymmetric, meaning that it was not normally distributed.

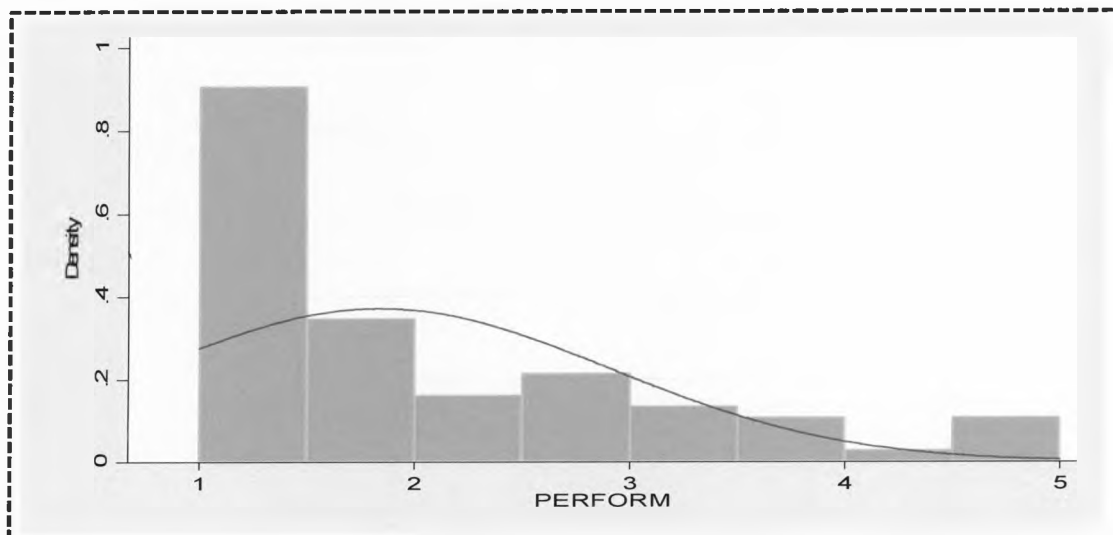


Figure 16: Distribution: Venture Performance

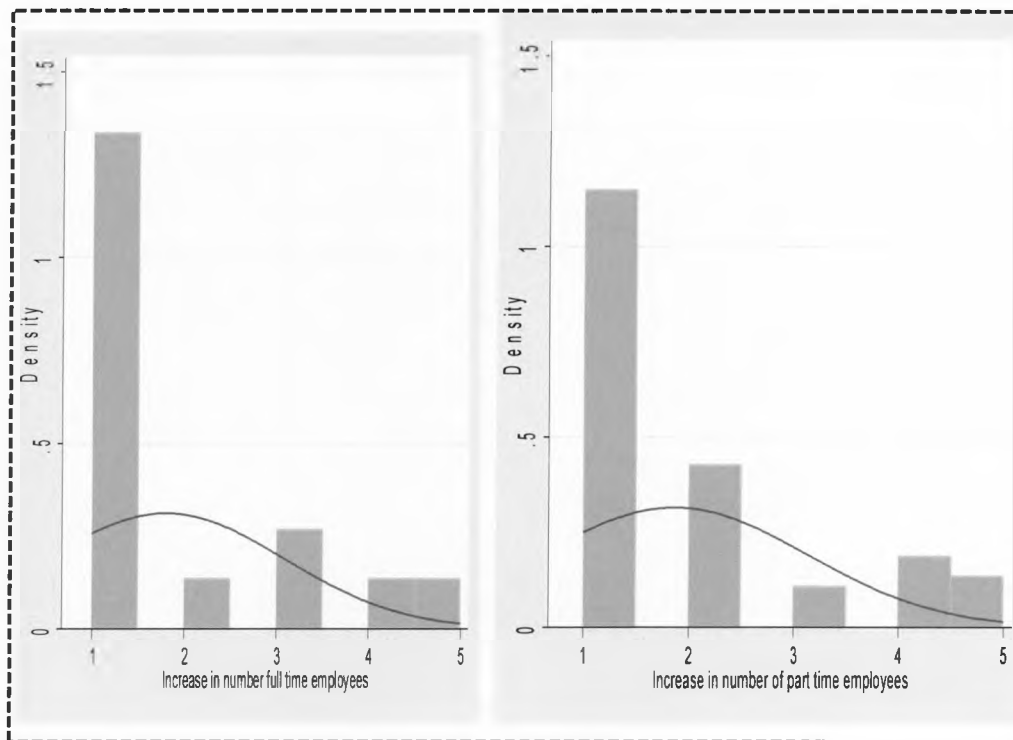


Figure 17: Distribution: Venture performance individual questions

The two figures display the distribution of the data, which is not normal and is heavily skewed to the left (0–10%).

4.5 RELIABILITY

Reliability is a process whereby the degree to which the set of chosen items measure a single one-dimensional latent construct. The examination of reliability gives the researcher comfort that the research instrument measures the subject consistently and it can be interpreted across various contexts (Bryman & Bell, 2014; Field, 2013; Salkind, 2016). Reliability is tested through the use of Cronbach's Alpha, which is a reliability technique that calculates "the average value of the reliability coefficients one would obtain for all possible combinations of items when split into two half-tests" (Gliem & Gliem, 2003, p. 48).

The reliability coefficient normally ranges between 0 and 1. The closer the results are to 1.0 the greater internal consistency of the items in the scale. Table 10 provides a summary of ranges of Cronbach Alpha results and this is overlaid with a view of which results are deemed to be excellent and which are deemed to be poor.

Table 10: Summary of Cronbach Alpha results ranges

Cronbach Alpha	Consistency
>0.9	Excellent
>0.8	Good
>0.7	Acceptable
>0.6	Questionable
>0.5	Poor

Source: Gliem & Gliem, 2003 (p. 87)

The overall Cronbach Alpha results from the survey, which included the variables of the study, causation, effectuation, was determined to be 0.7481 (Please refer to Appendix E for Cronbach Alpha per measure). The Cronbach's Alpha coefficient is higher than .70 and is therefore considered to be an acceptable measure of internal consistency. The research instrument questions (Appendix A) produced results that were reliable, therefore the questions in the study measured the subject consistently and asked what they were intended to ask and therefore are also considered to be valid.

4.6 DESCRIPTIVE STATISTICS: INDIVIDUAL QUESTIONNAIRE ITEM

The section below provides an overview of the descriptive statistics questions that were included in the questionnaire (Appendix A). Individual questionnaire items are presented in Appendix D. An analysis of the individual items reflecting the particular construct reveals the following results.

4.6.1 Descriptive statistics: Causation

Questions 4.2–4.8 of the questionnaire (Appendix A) were intended to test causation. A seven-point Likert-type scale was used where the respondents were asked to select from a range of strongly agree to strongly disagree. The mean scores for causation ranged from 1.95–2.9 (Appendix D) suggesting that, on average, the respondents “somewhat disagreed” with the questions presented to test the use of causation.

4.6.2 Descriptive statistics: Effectuation

Descriptive statistics for effectuation are divided into the four sub-dimensions of effectuation and are discussed below:

- Questions 5.1–5.4 of the questionnaire (Appendix A) were intended to test experimentation, a sub-dimension of effectuation. A seven-point Likert-type scale was used and the respondents were requested to select a response option from a range of strongly agree to strongly disagree. The mean scores for experimentation ranged from 2.6–4.1 (Appendix D). Question 5.2 had the highest mean score of 4.1, implying that the respondents were uncertain ($M=4.1$) whether the product/service that they now provide was essentially the same as originally conceptualised. The mean scores for Questions 5.1, 5.3 and 5.4 ranged from 2.6–3, suggesting that, on average, the respondents “somewhat disagreed” with the questions presented to test the use of experimentation.
- Questions 5.5–5.7 of the questionnaire (Appendix A) were intended to test affordable loss, which is a sub-dimension of effectuation. A seven-point Likert-type scale was used and the respondents were requested to select a response option from a range of strongly agree to strongly disagree. The mean scores for experimentation ranged from 1.8–2.7 (Appendix D), suggesting that, on average, the respondents “somewhat disagreed or disagreed” with the questions presented to test the use of affordable loss.
- Questions 5.8–5.11 of the questionnaire (Appendix A) were intended to test flexibility, which is a sub-dimension of effectuation. A seven-point Likert-type scale was used and the respondents were requested to select a response option from a range of strongly agree to strongly disagree. The mean scores for experimentation ranged from 1.9–3.0 (Appendix D), suggesting that, on average, the respondents “somewhat disagreed or disagreed” with the questions presented to test the use of flexibility.
- Questions 5.12–5.13 of the questionnaire (Appendix A) were intended to test pre-commitments, which is a sub-dimension of effectuation. A seven-point Likert-type scale was used and the respondents were requested to select a response option from a range of strongly agree to strongly disagree. The mean scores for experimentation ranged from 2.8–3.0 (Appendix D), suggesting that, on average,

the respondents “somewhat disagreed” with the questions presented to test the use of flexibility.

4.6.3 *Descriptive statistics: Venture performance*

Questions 6.2–6.3 of the questionnaire (Appendix A) were intended to test pre-commitments, which is a sub-dimension of effectuation. Respondents were asked to provide an indication of growth on a five-item index ranging from 0–10% to over 40%. The mean scores for experimentation ranged from 1.80–1.87 suggesting that, on average, the ventures had little increase (0–10%) in the number of full-time and part-time employees in their companies in the past three years.

4.7 PRINCIPAL COMPONENTS ANALYSIS

Principal components analysis is a method of data reduction that takes a large set of variables and summarises them using a smaller set of components or a smaller set of factors (Pallant, 2011). If a value is to be considered critical in the analysis, its eigenvalues have to be greater than 1. Eigenvalues are the variances of the principal components. Principal components analysis assumes that each original measure is collected without measurement error.

4.7.1 *Principal component analysis: Causation*

A principal component analysis was conducted for causation. Two variables from the analysis produced results where the eigenvalue was greater than 1; these are the critical factors in this subscale. The first component extracted in a principal component analysis accounted for a maximal amount of total variance in the observed variables. In this case, it accounted for 42% of the total variance in the causation subscale. The second variable had an eigenvalue of 1.09 and accounted for 15.7% of the total variance in the scale. The total variance of the two variables in the causation subscale is the sum of the variances of these two variables (57.6%). Table 11 provides a summary of results.

Table 11: Principal components – Causation

Component	Eigenvalue	Difference	Proportion	Cumulative
Comp1	2.94	1.855	0.421	0.421
Comp2	1.09	0.194	0.156	0.576
Comp3	0.90	0.167	0.128	0.704
Comp4	0.73	0.250	0.104	0.808
Comp5	0.48	0.018	0.069	0.877
Comp6	0.46	0.061	0.066	0.943
Comp7	0.40		0.057	1.000

Number of observations = 76

Kaiser-Meyer-Olkin measure of sampling adequacy=0.756

Table 12 contains component loadings, which are the correlations between the variable and the component. The two factors critical in this subscale are shown by the highest factor loadings (correlations).

The factor loadings (0.577) for Question 4.2 (“We analysed long-run opportunities and selected what we thought would provide the best returns”) were identified as the most critical factor in this subscale of causation. Question 4.8 (“We designed and planned production and marketing efforts”) was identified as the second most influential factor with a factor loading of 0.566.

To determine if the model is fit, the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was applied and showed some adequacy (0.756). This measure varies between 0 and 1, and values closer to 1 are better. Chandler et al. (2011) provided guidance that the KMO should be greater than 0.5.

Table 12: Principal components (eigenvectors) – Causation

Variable	Comp1	Comp2
Q4.2	0.3131	0.5772
Q4.3	0.3603	0.4089
Q4.4	0.444	0.2261
Q4.5	0.3454	-0.2229
Q4.6	0.3913	-0.2624
Q4.7	0.4079	-0.0973
Q4.8	0.3692	-0.5662

4.7.2 Principal component analysis: Effectuation

A principal component analysis was conducted for effectuation. Five variables were identified for effectuation where the eigenvalues were greater than 1; these are the critical factors in this subscale.

- The first component extracted in a principal component analysis accounted for a maximal amount of total variance in the observed variables. It has an eigenvalue of 3.2 and accounted for 24.8% of the total variance in the effectuation subscale.
- The second variable had an eigenvalue of 2.4 and accounted for 19% of the total variance in the scale.
- The third variable had an eigenvalue of 1.5 and accounted for 11% of the total variance in the scale.
- The fourth variable had an eigenvalue of 1.3 and accounted for 10% of the total variance in the scale.

- The fifth variable had an eigenvalue of 1.1 and accounted for 8% of the total variance in the scale.

The total variance of the two variables in the effectuation subscale is the sum of the variances of these two variables (73%). Table 13 provides an overview of the principal components for effectuation.

Table 13: Principal components – Effectuation

Component	Eigenvalue	Difference	Proportion	Cumulative
Comp1	3.23	0.749	0.248	0.248
Comp2	2.48	1.026	0.191	0.439
Comp3	1.45	0.152	0.112	0.551
Comp4	1.30	0.180	0.100	0.651
Comp5	1.12	0.308	0.086	0.737
Comp6	0.81	0.231	0.063	0.800
Comp7	0.58	0.079	0.045	0.844
Comp8	0.50	0.083	0.039	0.883
Comp9	0.42	0.051	0.032	0.915
Comp10	0.37	0.084	0.028	0.944
Comp11	0.28	0.028	0.022	0.966
Comp12	0.26	0.065	0.020	0.985

Component	Eigenvalue	Difference	Proportion	Cumulative
Comp13	0.19	-	0.015	1.000

Table 14 contains component loadings, which are the correlations between the composite variable (effectuation) and its components. The five most influential factors in this subscale are shown by the highest factor loadings (correlations). The correlations are interpreted regardless of the plus and minus sign. The most influential factor (0.596) in this subscale was Question 5.5 (“We were careful not to commit more resources than we could afford to lose”); followed by the factor loadings (0.563) for Question 5.1 (“We experimented with different products and/or business models”). The third, fourth and fifth most influential factors were Question 4.3 (0.483) (“We developed a strategy to best take advantage of resources and capabilities”); Question 5.6 (0.435) (“We were careful not to risk more money than we were willing to lose with our initial idea”) and Question 4.6 (0.406) (“We researched and selected target markets and did meaningful competitive analysis”).

Table 14: Principal components (eigenvectors) – Effectuation

Variable	Comp1	Comp2	Comp3	Comp4	Comp5
Q4.2	0.132	0.283	0.008	0.472	0.504
Q4.3	0.062	- 0.350	- 0.483	0.300	0.038
Q4.4	- 0.066	0.285	0.627	- 0.085	0.067
Q4.5	0.309	0.361	0.056	0.323	0.027
Q4.6	0.199	- 0.406	0.340	0.249	0.137
Q4.7	0.348	- 0.339	0.221	0.073	0.034

Q4.8	0.290	- 0.381	0.288	- 0.040	0.083
Q5.1	0.293	0.063	- 0.061	- 0.563	0.210
Q5.2	0.356	0.097	- 0.050	- 0.316	- 0.131
Q5.3	0.313	0.281	- 0.267	- 0.004	0.260
Q5.4	0.384	- 0.051	- 0.163	- 0.183	0.199
Q5.5	0.309	0.019	- 0.083	0.160	- 0.596
Q5.6	0.286	0.257	0.114	0.174	- 0.435

4.8 CORRELATION ANALYSIS

Correlation analysis techniques are adopted by researchers to measure the strength of a relationship between two variables (Field, 2013). The study utilised the Spearman's rank-order correlation or Spearman's correlation, which is used to measure the strength and direction of the relationship between two continuous or ordinal variables. The measure calculates a coefficient designated as r_s or ρ . The correlation coefficient can take on any value between the ranges of -1 to +1. A value of -1 indicates that a perfect negative correlation is in place between the variables, meaning that there is a negative association between the variables and when one increases the other decreases. A value of +1 indicates a perfect positive correlation between the variables, meaning that there is a positive association between the variables and when one increases the other increases. A value of 0 indicates that no correlation exists between the variables at all.

Table 15: Spearman's correlation-venture performance

	PERFORMANCE
PERFORMANCE	1
EFFECTUATION	0.0882
• Experiment	0.1364
• Affordable	-0.0615
• Flexibility	-0.0515
• Pre-commitment	0.2685*
CAUSATION	0.0668

*Two-tailed significance (0.05)

Table 15 provides a summary of association results of between the independent and dependant variable. Spearman's correlation analysis conducted to ascertain the relationship between venture performance and the independent variables. In line with the methodology presented in the previous chapter, the statistical significance was set at a 5% level.

Pre-commitment, a sub-item of effectuation, had a significant positive association with the performance of the firm ($r_s = 0.268$; $p < 0.05$), though weak. These results suggest that it could only be pre-commitment that was associated with the performance of the firm. Effectuation factors of experimentation, affordable loss (-0.0615), and flexibility (-0.0515) seem to have a weak negative association, if any, with performance. Association is not causal (a relationship), hence further tests will be conducted to test if there are any relationships between the independent variable of effectuation and causal factors and the dependent variable venture performance.

From the results presented above, there seems to be a weak positive association between causation (0.0668) and effectuation (0.0882) decision-making strategies and performance of nascent entrepreneurship ventures in this study.

4.9 RESULTS PERTAINING TO HYPOTHESIS 1

This subsection examines the effect of the selection of effectual or causal decision-making strategies on the performance of nascent entrepreneurship ventures in South Africa.

The independent samples t-test compares the difference in the means from two groups to a given value. The smaller the standard error of the mean, the more likely that the sample mean is close to the true population mean. The smaller the standard error of the mean, the larger the magnitude of the t-value and therefore, the smaller the p-value (Pallant, 2011).

Hypothesis 1 of the study proposed that there is a positive relationship between effectual decision-making strategies as used by nascent entrepreneurs and venture performance. There is a difference ($H_0: \text{mean (diff)} > 0$) between the mean scores for effectuation and firm performance. The p-value associated with the t-test is statistically significant at a 5% level ($p < 0.05$); hence, the null hypothesis ($H_0: \text{mean (diff)} = 0$) of no relationship is rejected. There is a relationship between effectuation and performance of the firm. The t-statistic is noted as positive ($t=5.6$), suggesting that there could be a positive relationship between effectuation and venture performances. Table 16 provides an overview of the results of the paired t-test: effectuation and venture performance.

Table 16: Paired t-test: Effectuation and venture performance

Variable	N	Mean	Std. Err.	Std. Dev.	95% Conf.	Interval
Effectuation	75	2.61	0.07	0.64	2.466	2.758
Venture Performance	75	1.83	0.12	1.08	1.586	2.081
Difference	75	0.78	0.14	1.20	0.503	1.055

Mean (diff) = mean (Effectuation–Performance) $t = 5.62$ $\Pr (|T| > |t|) = 0.00$

Hypothesis 1a asserts that there is a positive relationship between affordable loss as used by nascent entrepreneurs and venture performance. The results indicate that there is a difference (H_0 : mean (diff) > 0) between the mean scores for affordable loss and the performance of nascent entrepreneurship ventures in this study. The p-value associated with the t-test is statistically significant at a 5% level ($p < 0.05$); hence, the null hypothesis (H_0 : mean (diff) $= 0$) of no relationship is rejected. The t-statistic is positive ($t=3.5$), suggesting that there could be a positive relationship between affordable loss and venture performance. Table 17 provides an overview of the results of the paired t-test: affordable loss and venture performance.

Table 17: Paired t-test: Affordable Loss and venture performance

Variable	N	Mean	Std. Err.	Std. Dev.	95% Conf.	Interval
Affordable Loss	75	2.57	0.16	1.39	2.252	2.894
Venture Performance	75	1.83	0.12	1.08	1.586	2.081
Difference	75	0.74	0.21	1.81	0.323	1.157

Mean (diff) = mean (Affordable Loss–Performance) $t = 3.53$ $\Pr (|T| > |t|) = 0.00$

Hypothesis 1b posited that there is a positive relationship between pre-commitment as used by nascent entrepreneurs and venture performance. There is a difference (H_0 : mean (diff) > 0) between the mean scores for pre-commitment and performance of nascent entrepreneurship ventures in this study. The p-value associated with the t-test is statistically significant at a 5% level ($p < 0.05$); hence, the null hypothesis (H_0 : mean (diff) = 0) of no relationship is rejected. This suggests that there is a relationship between pre-commitment and performance of the firm. The t-statistics ($t=6.5$) suggests a strong positive relationship between the two variables. Table 18 provides an overview of the results of the paired t-test: pre-commitment and venture performance.

Table 18: Paired t-test: Pre-commitments and venture performance

Variable	N	Mean	Std. Err.	Std. Dev.	95% Conf.	Interval
Pre-commitments	75	2.91	0.15	1.28	2.618	3.208
Venture Performance	75	1.83	0.12	1.08	1.586	2.081
Difference	75	1.08	0.17	1.44	0.750	1.410

Mean (diff) = mean (Pre-commitments–Performance) $t = 6.51$ $Pr(|T| > |t|) = 0.00$

Hypothesis 1c posited that there is a positive relationship between flexibility and venture performance. The results indicate that there is a difference (H_0 : mean (diff) > 0) between the mean scores for flexibility and performance of nascent entrepreneurship ventures in this study. The p-value associated with the t-test is not statistically significant at 5% level ($p > 0.05$); hence, the null hypothesis (H_0 : mean (diff) = 0) of no relationship is not rejected. A conclusion can be made that there is no relationship between flexibility and performance of the firm. Table 19 provides an overview of the results of the paired t-test: flexibility and venture performance.

Table 19: Paired t-test: Flexibility and venture performance

Variable	N	Mean	Std. Err.	Std. Dev.	95% Conf.	Interval
Flexibility	75	1.98	0.09	0.75	1.810	2.156
Venture Performance	75	1.83	0.12	1.08	1.586	2.081
Difference	75	0.15	0.16	1.34	- 0.159	0.459

Mean (diff) = mean (Flexibility–Performance) $t = 0.96$ $Pr (|T| > |t|) = 0.345$

Hypothesis 1d posited that there is a positive relationship between experimentation and venture performance. The results indicate that there is a difference ($H_0: \text{mean (diff)} > 0$) between the mean scores for experimentation and the performance of nascent entrepreneurship ventures in this study. The p-value associated with the t-test is statistically significant at a 5% level ($p < 0.05$); hence, the null hypothesis ($H_0: \text{mean (diff)} = 0$) of no relationship is rejected. The t-statistic is positive ($t=8.8$), suggesting that there could be a positive relationship between experimentation and performance. Table 20 provides an overview of the results of the paired t-test: experimentation and venture performance.

Table 20 Paired t-test: Experimentation and venture performance

Variable	N	Mean	Std. Err.	Std. Dev.	95% Conf.	Interval
Experimentation	75	3.12	0.10	0.83	2.929	3.311
Venture Performance	75	1.83	0.12	1.08	1.586	2.081
Difference	75	1.29	0.15	1.27	0.996	1.578

Mean (diff) = mean (Experimentation–Performance) $t = 8.81$ $Pr (|T| > |t|) = 0.000$

4.10 RESULTS PERTAINING TO HYPOTHESIS 2

Hypothesis 2 of the research study posited that there is a negative relationship between causation decision-making strategies and venture performance. The results noted a difference (H_0 : mean (diff) > 0) between the mean scores for causation and performance of nascent entrepreneurship ventures in this study. The p-value associated with the t-test is statistically significant at a 5% level ($p < 0.05$): hence, the null hypothesis (H_0 : mean (diff) = 0) of no relationship is rejected. There is a relationship between causation and venture performance. However, the t-statistics ($t=3.49$) suggest a positive relationship between the two variables: this is contrary to the stated hypothesis. Please refer to Table 21: Paired t-test: causation and venture performance.

Table 21: Paired t-test: Causation and venture performance

Variable	N	Mean	Std. Err.	Std. Dev.	95% Conf.	Interval
Causation	75	2.35	0.09	0.77	2.172	2.525
Venture Performance	75	1.83	0.12	1.08	1.586	2.081
Difference	75	0.52	0.15	1.28	0.221	0.809

Mean (diff) = mean (CAUSATION–Performance) $t = 3.49$ $Pr(|T| > |t|) = 0.0008$

4.11 MULTIVARIATE ANALYSIS

STATA software allows us to specify multiple models in a single regression command. The model below (Table 22) is a multivariate structural equation that takes the mathematical form as follows ($y \sim x_1 x_2 x_3$). This model was chosen because it assists in proving how or if the variables are connected.

Table 22 indicates that venture performance was not influenced by the decision to utilise effectual or causal decision-making strategies. The results are not, however, statistically significant ($p < 0.05$). Although the results are not significant, they provide

insights; for example, the influence of effectual decision-making strategies was twice as much ($\beta=0.13$; $p>0.05$) when compared to causal decision-making strategies on the performance of nascent entrepreneurship ventures ($\beta=0.07$; $p>0.05$). This could suggest that possible effectuation strategies (13%) have twice the influence on venture performance when compared to causation strategies (7%) in this study. Salamon (2016) in his study of novice entrepreneurs in Germany determined that effectuation was not a better approach in the creation of new ventures when compared to causation. Through his research Salamon (2016) concluded that both approaches have the potential to contribute positively to the performance of new ventures.

Table 22: Structural equation model

	Coeff	Std Err.	z	P>z	95%	Conf.
Structural						
Venture Performance	< -					
Causation	0.07	0.17	0.40	0.69	- 0.261	0.394
Effectuation	0.13	0.20	0.64	0.52	- 0.265	0.523
_cons	1.34	0.58	2.30	0.02	0.196	2.483

The following model tests a possible relationship between respondents' profiles and performance of nascent entrepreneurship ventures.

Effectuation decision-making strategies have a positive effect (11%) on the performance of nascent entrepreneurship ventures, the results are however not statistically significant ($p<0.05$). Causal decision-making strategies have a positive effect (7%) on the performance of nascent entrepreneurship ventures but the results are not statistically significant ($p<0.05$). Respondent's position (mostly owners), remuneration costs (38.16 were paid) and the number of employees (most had less than 10) have the potential to contribute to negative effects on performance of nascent

entrepreneurship ventures; results are not statistically significant ($p < 0.05$). Years in firm (68% up to 6 years) seem to have the potential to contribute positively to the performance of nascent entrepreneurship ventures.

Table 23: Multivariate analysis

Venture Performance	Coef.	Std Err.	t	P>t	95% Conf.	Interval
Causation	0.07	0.18	0.42	0.67	-0.277	0.427
Effectuation	0.11	0.22	0.50	0.62	-0.329	0.549
Venture Position	- 0.01	0.40	- 0.03	0.98	-0.812	0.792
Years in Business	0.06	0.10	0.56	0.58	-0.144	0.257
People Employed	- 0.11	0.18	- 0.64	0.53	-0.474	0.245
Remuneration Paid	- 0.10	0.20	- 0.50	0.62	-0.506	0.302
_cons	1.66	0.80	2.08	0.04	0.065	3.255

4.12 SUMMARY OF THE RESULTS

The objective of this chapter was to provide an overview of the process that was followed in analysing the data for the study and to present the results that were derived from the study. The chapter began by describing the sample of respondents and the demographic characteristics of the respondents. This was followed by a review of the results of the tests conducted to determine if the data was normally distributed. The results of an analysis of the internal consistency and reliability were then presented and discussed. Inferential statistics were discussed and the research hypotheses were described and the data analysis techniques utilised to prove or disprove each hypothesis were explained.

The research results for Hypothesis 1 suggested that there is an association between effectuation and venture performance. The results of the research study also found evidence to suggest support for Hypotheses 1, the p-value associated with the t-test is statistically significant at a 5% level ($p < 0.05$); hence, the null hypothesis (H_0 : mean (diff) = 0) of no relationship is rejected. The results also found support Hypothesis 1a (the p-value associated with the t-test is statistically significant at a 5% level ($p < 0.05$); hence, the null hypothesis (H_0 : mean (diff) = 0) of no relationship is rejected), Hypothesis 1b (the p-value associated with the t-test is statistically significant at a 5% level ($p < 0.05$); hence, the null hypothesis (H_0 : mean (diff) = 0) of no relationship is rejected) and Hypothesis 1d (the p-value associated with the t-test is statistically significant at a 5% level ($p < 0.05$); hence, the null hypothesis (H_0 : mean (diff) = 0) of no relationship is rejected). The results found no support for hypothesis 1c (the p-value associated with the t-test is not statistically significant at 5% level ($p > 0.05$); hence, the null hypothesis (H_0 : mean (diff) = 0) of no relationship is not rejected).

The research results for Hypothesis 2 suggested that there is an association between causation and venture performance. The results noted a difference (H_0 : mean (diff) > 0) between the mean scores for causation and performance of nascent entrepreneurship ventures in this study. The p-value associated with the t-test is statistically significant at a 5% level ($p < 0.05$); hence, the null hypothesis (H_0 : mean (diff) = 0) of no relationship is rejected.

CHAPTER 5 : DISCUSSION OF THE RESULTS

5.1 INTRODUCTION

Chapter 5 will discuss the empirical results introduced in the previous chapter. The chapter makes reference to the literature that was discussed in Chapter 2 in order to form a rational basis from which to explain the empirical findings in relation to the theoretical foundation.

The chapter begins by discussing the descriptive statistics, the demographic profile and a description of the research sample. The empirical results are then discussed, followed by a discussion on the findings of each hypothesis. The findings presented in this study are compared with findings from predominant and current literature.

5.2 DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS

5.2.1 Age of sample

A significant proportion of the total respondents (53%) were aged between the ages of 26–35, almost a quarter (24%) were 36–45 and 13% were 46–55. Less than 10% were 18–25 while less than 5% were above 55. The demographic age profile of the respondents is consistent with the 2015/2016 total economic activity by age group reported by the GEM in the South Africa report. The report observed that the highest proportion of entrepreneurially active South Africans per age group was between the ages of 25–34 and 35–44 (Herrington et al., 2017).

The research report defines nascent entrepreneurship as an entrepreneurial venture undertaken by entrepreneurs aged between 18 and 64 (Herrington et al., 2017). The research study had therefore initially set out to obtain responses from this age group. The age demographic of the respondents aligns with the targeted age group with 99% of respondents between the ages of 18–64.

5.2.2 Position in venture

The vast majority of the total respondents (59%) were owners of the venture in question, while just over a quarter of the respondents (25%) classified themselves as owner/managers, meaning that they held a stake in the venture but also performed

the day-to-day management roles. Chandler et al. (2011) in their validation study for the measurements of causation and effectuation identified owners and owner/managers or lead entrepreneurs as key respondents for this survey.

5.2.3 Number of years in business

A large majority of the participants (31%) had been in business for approximately 3–4 years, while a quarter (25%) of the research participants had been in business for 1–2 years. Additional analysis of the results revealed that 12% of the respondents had been in business for 5–6 years and an equivalent number of participants had been in business for less than a year. A further 13% of the participants had been in business for 7–8 years and less than a tenth (7%) had been in business for nine years or more.

Chandler et al. (2011) in their study limited the age of the firm to five years or less to reduce the instability of recall data within their study. In the current research study, all research respondents whose ventures were older than five years (32%) were included. This is done partly because of the low response rate and partly because the firms in this sample are classified in the small business category as defined in the National Small Business Act (Republic of South Africa, 1996).

5.2.4 Number of people employed by the business

A significant proportion of the total respondents (45%) reported that their businesses had less than three employees, while slightly above a third (35.5%) had 4–6 employees. Less than 10% of respondents reported having more than 10–20 employees (9.2%) and less than 5% of the respondents employed 7–9 people. A marginal number of respondents (6.6%) had more than 20 employees. Ninety-three percent of the businesses sampled for this survey had less than 50 employees and therefore would be defined as small businesses in accordance with the National Small Business Act (Republic of South Africa, 1996). Only 7% of the respondents indicated that they had more than 20 employees.

5.3 DISCUSSION PERTAINING TO HYPOTHESIS 1

In presenting the results of the study and concluding on the hypotheses, the section will begin by revisiting the hypotheses that were presented in Chapter 2. A summary of the results of the primary hypotheses is presented and thereafter the results

pertaining to the hypothesis for each sub-dimension of effectuation and their relationship with venture performance are discussed in detail and related to the literature.

The hypotheses are restated for convenience:

Hypothesis 1: There is a positive relationship between effectual decision-making strategies and venture performance.

The results of the study determined that there is a relationship between effectuation and performance of the firm. The t-statistic is positive ($t=5.6$), suggesting that there could be a positive relationship between effectuation and venture performance. Read et al. (2009) in their meta-analytical study looked at data from 9 897 new ventures and they concluded that there is indeed evidence of a positive relationship between the effectual approach to strategy making and new venture performance. Roach et al. (2016) established that effectuation has an impact on firm-level innovativeness and ultimately firm performance: their results are consistent with the results of this study.

Cai et al. (2017) in their study of the effect of effectuation on the performance of 266 ventures in transitional economy China determined effectuation has a positive effect on new venture performance. Chidakwa (2016) in his study of high-growth ventures in Zimbabwe concluded that the characteristics and principles of effectuation decision-making are used by high-growth ventures in emerging markets. Previous research into effectuation has largely been conducted in the developed economies, therefore the results from the studies conducted by Cai et al. (2017) and Chidakwa (2016), which focused on transitional and emerging economies, are comparable in context to the current study that was conducted in emerging economy, South Africa.

The results of the current study are also consistent with the findings of Sarasvathy (2001) who identified that when dealing with an unpredictable future, expert entrepreneurs use effectuation processes. The study anticipated that in emerging market South Africa, effectuation processes would be considered useful. The results of this study support the view that in emerging economy South Africa, where the new venture mortality rate is chronically high and therefore indicative of an environment

where the future cannot be managed through prediction, effectuation is useful in new ventures creation (Chandler et al., 2011; Sarasvathy 2001; Cai et al., 2017).

The results of the sub-dimensions of effectuation are explained below.

Hypothesis 1a: There is a positive relationship between affordable loss and venture performance.

The results of the study determined that there could be a positive relationship between affordable loss and performance of the firm. The t-statistic is positive ($t=3.5$), which suggests that there could be a positive relationship between affordable loss and venture performance. The results align to the findings put forward by Dew, Sarasvathy, Read and Wiltbank (2009b) who determined that affordable loss is a key principle of effectuation, especially in environments where opportunities are made and not found: it is in these environments that the upside potential of such opportunity is most unpredictable.

This research paper argued that South Africa is such an environment for entrepreneurship and therefore expects affordable loss to be a guiding principle in new venture creation. The results of the current study are not in line with the results of a study conducted by Urban and Heydenrych (2015), who determined that the effectuation dimension of affordable loss does not impact significantly on the venture performance. One of the reasons for the difference in results might be because the study that they conducted was focused solely on the renewable energy sector while the current study did not focus on a specific sector or industry. Another key difference between the studies is that Urban and Heydenrych (2015) relied solely on financial measures of performance while the current study relied on non-financial measures of performance. The results of the current study are also not in agreement with the results of the meta-analytical review conducted by Read et al. (2009) who determined that the relationship between affordable loss and new venture performance was not significant (effect size = -0.019 , $p=0.847$). Deligianni, Voudouris and Lioukas (2015) could also not establish a relationship between affordable loss and venture performance.

Hypothesis 1b: There is a positive relationship between pre-commitment and venture performance.

The results suggest that there is a relationship between pre-commitment and performance of the firm. The t-statistics ($t=6.5$) suggest a strong positive relationship between the two variables. The results of this study are consistent with the results of a study conducted by Urban and Heydenrych (2015) who determined that the effectuation dimension of pre-commitment has a significant impact on the venture performance. Cai et al., (2017) determined that pre-commitment contributes to the performance of a new venture through experimental learning. Read et al. (2009) concluded that there is indeed evidence of a positive relationship between the sub-dimension of partnership and new venture performance. It is noted that the sub-dimension of partnership was not tested in this study; however, the core principle of the partnership sub-dimension is similar to that of pre-commitment.

Deligianni et al. (2015) determined that pre-commitment has a positive effect on the diversification and performance relationship. It is also worth noting that Chandler et al. (2011) determined that the pre-commitment sub-construct loaded onto both effectuation and causation.

Hypothesis 1c: There is a positive relationship between flexibility and venture performance.

The results of the study indicate that there is no relationship between flexibility and venture performance. The results of this study are not in line with the results of a study conducted by Urban and Heydenrych (2015) who determined that the effectuation dimension of flexibility has a significant impact on venture performance. The results of the current study are also not aligned to the results obtained by Deligianni et al. (2015) who determined that flexibility has a positive effect on the diversification-performance relationship.

Hypothesis 1d: There is a positive relationship between experimentation and venture performance.

The results indicate that there is a positive relationship between experimentation and venture performance. The t-statistic is positive ($t=8.8$), suggesting that there could be a positive relationship between experimentation and performance. The results of this study are in line with the results of a study conducted by Urban and Heydenrych (2015)

who determined that the effectuation dimension of experimentation has a significant impact on the venture performance. The results are also in line with Deligianni et al. (2015) who determined that experimentation has a positive effect on the diversification-performance relationship.

Table 24 provides an overview of the results of the study, followed by a detailed discussion on each hypothesis.

Table 24: Hypothesis 1: Summary of results

Nr	Hypothesis	Analytical Model	Support
H1	There is a positive relationship between effectual decision-making strategies and venture performance	Correlational analysis, Paired tests and Multivariate analysis	Yes
H1a	There is a positive relationship between affordable loss and venture performance		Yes
H1b	There is a positive relationship between pre-commitment and venture performance		Yes
H1c	There is a positive relationship between flexibility and venture performance		No
H1d	There is a positive relationship between experimentation and venture performance		Yes

5.4 DISCUSSION PERTAINING TO HYPOTHESIS 2

The hypotheses are restated for convenience:

Hypothesis 2: There is a negative relationship between causal decision-making strategies and venture performance accepted.

The results of the study determined that there is a relationship between causation and venture performance. However, the t-statistics ($t=3.49$) suggest a positive relationship

between the two variables; this is contrary to the stated hypothesis. Heydenrych (2013) who presented the same hypothesis could not obtain any evidence of a relationship between causation and venture performance. The findings of the current research seem to go against the belief that in environments characterised by Knightian uncertainty, causation processes, which promote prediction, are not favourable and therefore are not likely to lead to successful outcomes (Chandler et al., 2011; Fisher, 2012; Sarasvathy 2001).

Heydenrych (2013) identified that the inexperience among the entrepreneurs sampled in a study could influence the results of the study. Effectuation is considered logic mostly used by expert entrepreneurs and therefore, in a sample of inexperienced or nascent entrepreneurs, the use of causation may be more pronounced. This could be a possible explanation for the deviation of the results from what was expected.

The results of the current study do, however, support the view put forward by Sarasvathy (2001) who noted that effectuation was not meant to displace causation and underpinned the importance of both logics as tools available to an entrepreneur to employ, depending on the context and the actions that are required to be taken by the entrepreneur. This, therefore, allows for agility in the application of the alternative logics, with the possibility of applying both logics simultaneously or a different logic at a different phase of the venture as the context and profile of the venture changes (Alvarez & Barney, 2005; Sarasvathy, 2001; Sarasvathy, 2009). This view is also supported by the findings of the research study conducted by Salamon (2016) who determined that causation and effectuation have negative and positive attributes and both have a non-negligible influence in a venture.

Table 25: Hypothesis 2: Summary of results

Nr	Hypothesis	Analytical Model	Support
H2	There is a negative relationship between causal decision-making strategies and venture performance accepted	Correlational analysis, Paired tests and	No

		Multivariate analysis	
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The study finds evidence to support the proposal that entrepreneurs employ both effectuation and causation logics with a certain level of success for the venture. The findings of the study indicate that venture performance was not necessarily influenced by the decision to utilise effectual or causal decision-making strategies. The results are not, however, statistically significant ($p < 0.05$). Although the results are not significant, they provide insights, for example, the influence of effectual decision-making strategies was twice as much ($\beta = 0.13$; $p > 0.05$) when compared to causal decision-making strategies on the performance of nascent entrepreneurship ventures ($\beta = 0.07$; $p > 0.05$). This could suggest that possible effectuation strategies (13%) and causation strategies (7%) may have a positive influence on venture performance. This finding supports the findings of Rust (2011) and Hechter (2012) that established that entrepreneurs employ decision-making logics interchangeably as there are no pure causal or effectual ventures.

Sarasvathy (2001) somewhat concedes to this point by asserting that effectuation was not meant to displace causation and underpinned the importance of both logics as tools available to the entrepreneur, depending on the context and the actions that are required to be taken by the entrepreneur. This allows for agility in the application of the alternative logics, with the possibility of applying both logics simultaneously or a different logic at a different phase of the venture as the context and profile of the venture changes (Sarasvathy, 2001; Sarasvathy, 2009; Alvarez & Barney, 2005).

5.5 CONCLUSION

The objective of this chapter was to discuss the empirical results and the findings of the study as they relate to each hypothesis. The findings derived from the study were compared with findings from the literature discussed in Chapter 2.

The research results for Hypothesis 1 suggested that there is an association between effectuation and venture performance and therefore the hypothesis was accepted. The results of the research study also found evidence to suggest support for Hypotheses 1a, 1b, and 1d, which predicted a positive association between the sub-dimensions of

affordable loss, pre-commitment and experimentation. No evidence was found to support any association between flexibility and venture performance.

The study found evidence that suggested that there could be a positive relationship between causation and venture performance, contrary to the stated hypothesis. The study also finds evidence to support the view that entrepreneurs utilise both effectuation and causation logics with a certain level of success for the venture. The findings of the study indicate that venture performance was not necessarily influenced by the decision to adopt effectual or causal decision-making strategies.

CHAPTER 6 : CONCLUSION

6.1 INTRODUCTION

The ultimate chapter of the research study aims to provide a summary of empirical findings identified in the study. The theoretical, managerial and policy contributions of the research will be explained. The chapter then outlines the limitations of the study, which readers should be aware of when interpreting the results. The study concludes by making suggestions for future research.

6.2 CONCLUSIONS OF THE STUDY

The empirical research study set out to assess the relationship between the use of traditional causation decision-making strategies and emerging effectual decision-making strategies, on the performance of nascent entrepreneurship ventures in South Africa. The importance of research of this nature is twofold.

Firstly, it is incumbent upon researchers to examine the suitability and usability of emerging theories in various environments, contexts and geographies. These theories challenge traditional perspectives and models of entrepreneurship and bring with them the possibility of reshaping the entrepreneurial process and enhancing the rate of success for sustainable entrepreneurial ventures.

Secondly, there is a distinct possibility that through the achievement of critical mass in research on this subject, the empirical findings produced from such research could influence the revision of entrepreneurship, trade and business development policies that have been implemented by the government. In some cases, this could promote the introduction of new policies that align themselves with emerging practice that is deemed effective. The ultimate goal, however, is that through empirical findings, researchers can influence how entrepreneurs practically go about the entrepreneurial process (Perry et al., 2012; Read et al., 2009; Reuber et al., 2016; Fisher, 2012; Salamon, 2016; Urban, & Heydenrych, 2015; Venkataraman & Sarasvathy, 2001).

As noted in previous chapters, the development of successful and sustainable entrepreneurial ventures is without doubt a fundamental aspect in the stimulation of

growth in this country (National Planning Commission, 2011). However, developing economy entrepreneurs are faced with unique problems and sometimes they also face what may seem to be insurmountable challenges when pursuing the difficult task of new venture creation and development. This is evident as developing economies, such as South Africa, are characterised by uniquely high business failure rates (SAICA, 2016; Corrigan et al., 2013). Therefore, in this environment of high uncertainty effectuation presents an alternative approach to the widely-used causation approach to new venture creation, as it captures and leverages heuristics that are applied by expert entrepreneurs in the process of opportunity recognition, development, evaluation and execution (Ardichvili et al., 2003; Sarasvathy, 2001). This is particularly important, as the ability of an entrepreneur to identify and pursue the right opportunities for their business is fundamental to the success of any entrepreneurial venture (Stevenson, Roberts, & Grousbeck, 1985 as cited in Ardichvili et al., 2003).

The research results find support for Hypothesis 1 and suggest that there is an association between effectuation and venture performance. The results of the research study also found evidence to suggest support for Hypotheses 1a, 1b, and 1d which predicted a positive association between the sub-dimensions of affordable loss, pre-commitment, and experimentation. There was, however, no significant evidence found to support any association between flexibility and venture performance. The study found evidence that suggested that there could be a positive relationship between causation and venture performance, contrary to the stated hypothesis and therefore the hypothesis was rejected.

The study finds evidence to support that entrepreneurs use both effectuation and causation logics with a certain level of success for the venture. The findings of the study indicate that venture performance was not necessarily influenced by the decision to employ effectual or causal decision-making strategies. The results are not, however, statistically significant ($p < 0.05$). Although the results are not significant they provide insights, for example, the influence of effectual decision-making strategies was twice as much ($\beta = 0.13$; $p > 0.05$) when compared to causal decision-making strategies on the performance of nascent entrepreneurship ventures ($\beta = 0.07$; $p > 0.05$). This could suggest that possible effectuation strategies (13%) have twice the influence on venture performance when compared to causation strategies (7%) in this study.

6.3 IMPLICATIONS AND RECOMMENDATIONS

The research makes a contribution to the discourse about the suitability of effectuation as a decision-making logic that entrepreneurs can apply in emerging economies.

6.3.1 Entrepreneurs

The findings of the study provide evidence for the theoretical arguments put forward by Sarasvathy (2001), that effectuation has a positive impact on the performance of new venture. The study brings the argument closer to home and provides evidence that in emerging economy South Africa, where the entrepreneurial environment is inherently uncertain, it is plausible that effectuation is an alternative solution to causation.

The implication for entrepreneurs is that effectuation provides a different method that entrepreneurs can utilise in the formation of new ventures. Should entrepreneurs determine that the environment in which they are operating or the opportunities they are pursuing are characterised by high levels of uncertainty, effectuation is a possible alternative. The study, however, finds that only the sub-dimensions of affordable loss, pre-commitment and experimentation have an association with venture performance. No association was found between flexibility and venture performance.

The interpretation of these results leads the study to recommend the application of individual principles of effectuation by entrepreneurs. Affordable loss, pre-commitment, experimentation and even flexibility are prudent principles, especially from a risk management perspective. Sarasvathy (2001) set out to capture the heuristics of expert entrepreneurs; these principles are therefore the guiding values of seasoned entrepreneurs and should be considered for application by novice entrepreneurs (Dew et al., 2009a)

6.4 LIMITATIONS OF THE STUDY

The following limitations were identified:

- The study was cross-sectional in nature, meaning that the research survey was completed at a point in time. This research method has been identified as particularly prone to Common Methods Variance (Meade, Watson, & Kroustalis, 2007).
- The research study will focus on nascent entrepreneurs in South Africa, irrespective of the sector or industry where the entrepreneurial venture is participating or aims to participate.
- Only 76 usable responses were received for the survey. The sample was therefore short of the intended target of 150. This resulted in a data set that was not normally distributed. A larger sample would increase the likelihood of a normally distributed data set and therefore improve the insight that researchers are able to garner from the results.
- The study utilised employment (part-time and full-time as the sole measure of venture performance. This method of measuring firm performance is not always effective representative of venture performance.

6.5 SUGGESTIONS FOR FURTHER RESEARCH

The empirical findings of this research study and other research studies suggest that entrepreneurs utilise both causation and effectuation decision-making strategies interchangeably or simultaneously depending on the phase, context and profile of the venture. It is suggested that a longitudinal study is perhaps more suitable than a cross-sectional study in measuring the use of effectuation and causation decision-making logic and more importantly correlating them to venture performance. A longitudinal study would also provide more insight as to whether entrepreneurs use effectuation predominantly at venture start-up when uncertainty is at its highest and as the business progresses and information becomes more readily available, (allowing for the use of prediction instruments) entrepreneurs revert to causation strategies to sustain their ventures.

The study supports suggestions that have been made in previous studies such as Heydenrych (2013) and Cai et al. (2017), which propose additional research into the measures of effectuation and believe that the current measures are insufficient. This study also suggests that future research should include enhancements to measures of causation as the measures put forward by Chandler et al. 2011 may not adequately address the assortment of what Sarasvathy (2001) grouped together and called causation strategies.

Finally, researchers should consider additional research aimed at the development of a standard measure or measures for nascent entrepreneur performance. This is critical for the development of research that is aimed at measuring the influence of effectuation on the performance of nascent ventures. Without these standardised measures, the ability to compare results derived from different studies becomes difficult (Cai et al., 2017; Arend, Sarooghi, & Burkemper, 2015).

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APPENDIX A: Research instrument

Q3.1 SECTION A: BACKGROUND INFORMATION (INFORMATIONAL ONLY) In this section we would like to ask you a few questions about yourself and your business venture. Please select the option that best describes you and your business venture.						
Q3.2 Are you male or female?	Male			Female		
	☐			☐		
Q3.3 What is your age?	18 - 25	26 - 35	36 - 45	46 - 55	56 - 64	65 and above
	☐	☐	☐	☐	☐	☐
Q3.4 What is your position in the company?	Owner	Shareholder	Partner	Owner/Manager	Manager	
	☐	☐	☐	☐	☐	

Q3.5 How many years has your firm been in business?	Less than 1 year	1 - 2 years	3 - 4 years	5 - 6 years	7 - 8 years	9 years or more
	☐	☐	☐	☐	☐	☐
Q3.6 How many people (including you) are employed by your firm?	Less than 3	4 - 6	7 - 9	10 - 20	More than 20	
	☐	☐	☐	☐	☐	
Q3.7 Have remuneration costs (e.g. salaries, wages or payments to owners) been paid by the company	Not been paid: 3 months or less	Not been paid: 3 months or more	Paid: 3 months or more		Paid: 42 months or more	
	☐	☐	☐		☐	

SECTION B: CAUSATION								
CAUSATION	Q4.1 In this section you will be asked a series of questions that are designed to assess an entrepreneur use of decision making processes. They are no correct or incorrect answers. Please answer all questions to the best of your knowledge. Please click on a response that best describes your experience regarding the following questions.	Strongly Agree	Agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Disagree	Strongly Disagree
	Q4.2." We analysed long-run opportunities and selected what we thought would provide the best returns".	☐	☐	☐	☐	☐	☐	☐
	Q4.3. "We developed a strategy to best take advantage of resources and capabilities"	☐	☐	☐	☐	☐	☐	☐
	Q4.4. "We designed and planned business strategies	☐	☐	☐	☐	☐	☐	☐
	Q4.5 "We organised and implemented control processes to make sure we met objective".	☐	☐	☐	☐	☐	☐	☐
	Q4.6 "We researched and selected target markets and did meaningful competitive analysis"	☐	☐	☐	☐	☐	☐	☐
	Q4.7 "We had a clear and consistent vision for where we wanted to end up".	☐	☐	☐	☐	☐	☐	☐
	Q4.8 "We designed and planned production and marketing efforts".	☐	☐	☐	☐	☐	☐	☐

SECTION C: EFFECTUATION								
EFFECTUATION: EXPERIMENTATION	Q5.1. "We experimented with different products and/or business models".	☐	☐	☐	☐	☐	☐	☐
	Q5.2. "The product/service that we now provide is essentially the same as originally conceptualised".	☐	☐	☐	☐	☐	☐	☐
	Q5.3 "The product/service that we now provide is substantially different than we first imagined".	☐	☐	☐	☐	☐	☐	☐
	Q5.4 "We tried a number of different approaches until we found a business model that worked".	☐	☐	☐	☐	☐	☐	☐
EFFECTUATION: AFFORDABLE LOSS	Q5.5 "We were careful not to risk more money than we were willing to lose with our initial idea."	☐	☐	☐	☐	☐	☐	☐
	Q5.6 "We were careful not to risk so much money that the company would be in real trouble financially if things did not work out".	☐	☐	☐	☐	☐	☐	☐
EFFECTUATION: FLEXIBILITY	Q5.7 "We allowed the business to evolve as opportunities emerged".	☐	☐	☐	☐	☐	☐	☐
	Q5.8 "We adapted what we were doing to the resources we had".	☐	☐	☐	☐	☐	☐	☐
	Q5.9 "We were flexible and took advantage of opportunities as they arose".	☐	☐	☐	☐	☐	☐	☐
	Q5.10 "We avoided courses of action that restricted our flexibility and adaptability".	☐	☐	☐	☐	☐	☐	☐

EFFECTUATION: PRE-COMMITMENT	Q5.11 "We used a substantial number of agreements with customers, suppliers and other".	☐	☐	☐	☐	☐	☐	☐
	Q5.12 "Organisations and people to reduce the amount of uncertainty".	☐	☐	☐	☐	☐	☐	☐
	Q5.13 "We used pre-commitments from customers and suppliers as often as possible".	☐	☐	☐	☐	☐	☐	☐
SECTION D: VENTURE PERFORMANCE								
VENTURE PERFORMANCE	In the final section of the survey you will be asked to rate your firm's growth, in line with the measures noted below:	0% - 10%	11% - 20%	21% - 30%	31% - 40%	Over 40%		
	Q6.2 Please indicate the increase in the number of full-time employees employed by your company over a three-year period.	☐	☐	☐	☐	☐		
	Q6.3 Please indicate the increase in the number of part-time employees employed by your company over a three-year period.	☐	☐	☐	☐	☐		

Source: Causation and effectuation processes: A validation study (Chandler et al., 2011, p.379)

Knowledge-based resources, entrepreneurial orientation and the performance of small and medium-sized businesses (Wiklund & Shepherd, 2003)

APPENDIX B: Consistency matrix

Assess the relationship between the use of traditional causation decision-making strategies and emerging effectual decision-making strategies, in the performance of nascent entrepreneurship ventures in South Africa.					
Sub-problem	Literature Review	Hypotheses or Propositions or Research questions	Source of data	Type of data	Analysis
Evaluate the effect of the selection of effectual or causation decision-making strategies on the performance of nascent entrepreneurship ventures in South Africa.	Chandler et al., 2011; Dew, et al., 2009a, 200; Salamon, 2016; Sarasvathy, 2001; Sarasvathy, 2009; Sarasvathy & Dew, 2005; Urban & Heydenrych, 2015	Hypothesis 1: Alternate Hypothesis 1: There is a positive relationship between effectual decision-making strategies and venture performance. Null Hypothesis 1: There is no relationship between effectual decision-making strategies and venture performance. Chandler et al. (2011), determined that effectuation is a formative, multi-dimensional construct with four sub-	Online Survey Questions 3–9 Survey Questions 3–9 Online Survey Question 23	Interval	Correlational analysis, Paired tests and Multivariate analysis

		dimensions; namely, affordable loss, pre-commitments, flexibility and experimentation. The research report, therefore, extends the main hypothesis as follows: a) Alternative Hypothesis 1a: There is a positive relationship between affordable loss and venture performance. Null Hypothesis 1a: There is no relationship between affordable loss and venture performance. b) Alternative Hypothesis 1b: There is a positive relationship between pre-commitment and venture performance.			
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		Null Hypothesis 1b: There is no relationship between pre-commitment and venture performance. c) Alternative Hypothesis 1c: There is a positive relationship between flexibility and venture performance. Null Hypothesis 1c: There is no relationship between flexibility and venture performance. d) Alternative Hypothesis 1d: There is a positive relationship between experimentation and venture performance.			
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		Null Hypothesis 1d there no relationship between experimentation and venture performance.			
	Chandler et al., 2011; Dew, et al., 2009a, 200; Salamon, 2016; Sarasvathy, 2001; Sarasvathy, 2009; Sarasvathy & Dew, 2005; Urban & Heydenrych, 2015	Chandler et al. (2011) determined that causation was a unidimensional construct. Alternative Hypothesis 2: There is a negative relationship between causation decision-making strategies and venture performance. Null Hypothesis 2: There is no relationship between causation decision-making strategies and venture performance.	Online Survey Questions 10–22 Online Survey Question 23 Survey Question 23	Interval	Correlational analysis, Paired tests and Multivariate analysis

APPENDIX C: Consent form

INFORMATION SHEET AND CONSENT FORM

Gooday

I am Wandile Malinga, a Masters in Entrepreneurship and New Venture Creation candidate (Student Number: 1770143) at the University of Witwatersrand Business School

I am in the process of collecting data for my research assignment, titled *Impact of effectuation and causation decision-making strategies on nascent entrepreneurship venture performance in South Africa*.

As a nascent business, your company has been selected, through your participation to submit data towards this research. The online survey will take approximately 15 minutes. Please note the following:

- Your participation is entirely voluntary in this study. The choice of whether to participate or not is yours alone.
- You may stop participating in the research at any time and tell me that you do not want to continue. If you do this there will also be no penalties and you will not be prejudiced in any way.
- Your confidentiality is guaranteed and your responses will not be distributed to external parties.

CONSENT

I hereby agree to participate in research on analysis. I understand that I am participating freely and without being forced in any way to do so. I also understand that I can stop participating at any point should I not want to continue and that this decision will not in any way affect me negatively. I understand that this is a research project whose purpose is not necessarily to benefit me personally in the immediate or short term. I understand that my participation will remain confidential.

Signature and Date

APPENDIX D: Descriptive Statistics: Individual questionnaire item

Variable	N	Mean*	Std. Dev.
CAUSATION			
Q4.2 We analysed long run opportunities and selected what we thought would provide returns.	76	2.2	1.25
Q4.3. We developed a strategy to best take advantage of resources and capabilities.	76	2.1	1.08
Q4.4. We designed and planned business strategies.	76	2.3	1.29
Q4.5. We organised and implemented control processes to make sure we met objectives.	76	2.9	1.47
Q4.6 We researched and selected target markets and did meaningful competitive analysis.	76	2.6	1.43
Q4.7 We had a clear and consistent vision for where we wanted to end up.	76	1.95	1.06
Q4.8 We designed and planned production and marketing efforts.	75	2.7	1.29

*Rounded off to the nearest decimal

Variable	N	Mean	Std. Dev.
EFFECTUATION			
Experimentation			
Q5.1 We experimented with different products and/or business models.	75	2.6	1.44
Q5.2 The product/service that we now provide is essentially the same as original conceptualised.	75	3.0	1.68
Q5.3 The product/service that we now provide is substantially different than we imagined.	75	4.1	1.96
Q5.4 We tried a number of different approaches until we found a business model.	75	2.8	1.67
Affordable Loss			
Q5.5 We were careful not to commit more resources than we could afford to lose.	75	2.6	1.48
Q5.6 We were careful not to risk more money than we were willing to lose with our initial idea.	75	2.6	1.61
Q5.7 We were careful not to risk so much money that the company would be in real financially if things did not work out.	75	1.8	0.93
Flexibility			
Q5.8 We allowed the business to evolve as opportunities emerged.	75	1.8	0.93

Q5.9 We adapted what we were doing to the resources we had.	75	1.9	0.89
Q5.10 We were flexible and took advantage of opportunities as they arose?	75	1.9	1.12
Q5.11 We avoided courses of action that restricted our flexibility and adaptability.	75	2.4	1.16
Pre-commitments			
Q5.12 We used a substantial number of agreements.	75	3.0	1.59
Q5.13 We used pre-commitments from customers and suppliers as often as possible.	75	2.8	1.45

*Rounded off to the nearest decimal

Variable	N	Mean	Std. Dev.
Venture Performance			
Q6.2 Please indicate the increase in the number of full-time employees employed by your company over a three-year period?	75	1.80	1.283997
Q6.3 Please indicate the increase in the number of part-time employees employed by your company over a three-year period.	75	1.87	1.266335

*Rounded off to the nearest decimal

APPENDIX E: Variable Cronbach Alpha Test

Item	Observations	Cronbach Alpha
CAUSATION		
Q4.2	76	0.7469
Q4.3	76	0.7363
Q4.4	76	0.7247
Q4.5	76	0.7351
Q4.6	76	0.7422
Q4.7	76	0.7325
Q4.8	76	0.7323
EFFECTUATION		
Q5.1	75	0.7534
Q5.2	75	0.7472
Q5.3	75	0.7568
Q5.4	75	0.7332

Q5.5	75	0.7411
Q5.6	75	0.7241
Q5.7	75	0.7373
Q5.8	75	0.7419
Q5.9	75	0.7334
Q5.10	75	0.7358
Q5.11	75	0.7295
Q5.12	75	0.7387
Q5.13	75	0.7405
Test scale		0.7481