# Proxy Indicators as a Measure of Economic Dispositions in South Africa

By

**Nico Barnard**

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**Supervisor: Prof. M. C. Oranje**

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***"I dedicate this dissertation to my father whom inspired me to be an astronaut and to keep questioning"***

## Abstract

More than half a century after the liberation of the majority of African countries, Africa is facing major socio-economic challenges including unemployment, slow economic growth and inequality. With waves of violent service delivery protests over the last few years throughout South Africa, it is now more than ever vital to identify the key challenges to development and the ways to overcome these trials.

The importance of plans for development, and that reliable data plays an essential role in development have been wildly discussed, especially as the legitimacy and reliability of plans are highly dependent upon the quality of the data utilised. Even though data plays such a significant role in development, quality up to date data is expensive, difficult to obtain and in many instances not available. Furthermore, South Africa and many developing countries do not have the luxury of such data, nor the skills and resources to develop high quality statistics on a regular basis. In the light of the importance of accurate up-to-date data for planning and the lack of the aforementioned data in South Africa, the dissertation explores means of 'accessing' high quality up-to-date data by the use of 'proxy indicators'.

The dissertation seeks to explore whether it would be possible to use proxy indicators to measure local economic conditions and to identify a set of proxy indicators that accurately portray the economy. The study commences with an analysis on the relationship between a number of proxy indicators and the national economy in order to identify a set of proxy indicators that accurately portrays the economy where after the accurate indicators is empirically tested to that of the local economy in three study areas.

The study established that six proxy indicators can be used to measure the local economy in South Africa. These are the (1) number of middle class residential properties sold, (2) growth in residential building activity, (3) retail sales of durable goods including business profit, (4) hardware sales including business profit, (5) volume of sales of spare parts for vehicles and (6) fuel consumption. Apart from the fact that the indicators mirror the economy to a high degree, a number of trends with regards to the dynamics of the relationship between the indicator and the economy were revealed. The study demonstrated that there is merit in further studies regarding the use of proxy indicators in planning.

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# Section 1: Introduction

# Chapter 1: The art of asking the right question

***"I still find each day too short for all the thoughts I want to think, all the questions I want to ask and all the friends I want to see."***

***--John Burrough (1900)***

## 1. The Astronaut

As a young man my father told me that the key to wisdom is not in knowing all the answers, but in asking the right questions. Over the years this truth formed the foundation of my continued challenge of the status quo, of asking question upon question in the quest to find the right answer.

My quest followed the path of many before me, in asking who we are, what we know and the vast reality between them. Employed as a Development Economist, I started working with a magnitude of economic and statistical data, graph upon graph and number upon number that all formed part of an unchallengeable monarchy of certainty. Through the years, I began to see a difference between the 'real world' and the statistical realm that I was part of. I began to question the validity of the data I based numerous economic models and projections on. Along this path of questioning it seems that the right question to ask is if there is an alternative way, not another statistical way of manipulating data collected ten years ago, but a 'different' and innovate way to understand local economies.

In the blockbuster, Jurassic Park III (2001), Dr. Alan Grant said the following: 'I have a theory that there are two kinds of boys. There are those that want to be astronomers, and those that want to be astronauts. The astronomer gets to study amazing things from a place of complete safety, but they never get to go into space.'

My aspiration is to leave the safety of status quo, and venture on the path of new discovery. The dissertation thus sets out to explore alternative measures (proxies) that can give insight into local economies in South Africa, and I hope that this dissertation raises more questions than it answers.

## 2. Context

More than half a century after the liberation of the majority of African countries (White, 2012), Africa is facing major socio-economic challenges including unemployment, slow economic growth and inequality (Duncan et al, 2008; Gumede, 2012; Smith, 2007; Loayza et al, 2013; Akukwe, 2013; Ranganathan & Foster, 2011). With waves of violent service delivery protests over the last few years throughout South Africa (Alexandera, 2010; Bearak, 2009; Brooks, 2009), it is now more than ever imperative to identify the key challenges to development and the ways to overcome these trials.

The importance of plans for development have been widely discussed (Klosterman, 1985; Healey et al, 1997; Hopkins, 2001; McDonald, 1997), as well as the fact that reliable economic data is an essential part of planning and policy making (US Aid, 2006), economic development (Krebs & Hamilton, 2009; Coetzee, 2009) and land use planning (Lai & Ho, 2002). South Africa, and many developing countries (Coetzee, 2009) does not have the luxury of such data, nor the skills and resources (financial, human capital) to perform high quality research on a regular basis. As the legitimacy and reliability of plans and strategies are highly dependent upon the quality of the data utilised (Coetzee, 2009), it is vital for private sector business decisions, researchers, academics and legislators to have access to quality, up-to-date data on which to base policy and strategic decisions (ATN, 2010; Mohr, 2009).

Even though data plays such a significant role in planning, quality up to date data is expensive, difficult to obtain and in many instances not available. Coetzee (2009) states that there is a perception in South Africa that quality up-to-date data are non-existent. Cortright and Reamer (1998) agree with Coetzee and argued that there is a major limitation of up-to-date data, especially at local level. This however does not mean that data in its entirety is not available, but that the appropriateness of the data to inform important strategic planning decisions is highly debatable in terms of its reliability and timeframes. In the present statistical data environment in South Africa, most official demographic and economic data stems from the last South African Census (2001) and Community Survey (2007), conducted by Statistics South Africa. This information is largely out-dated for economic analysis purposes and is questionable in terms of credibility (Endumeni Local Municipality, 2009).

It is especially in the area of 'non-mainstream aspects' that major limitations are experienced, e.g. in quantifying the second economy (DPRU Policy Brief, 2008; Mohr & Fourie, 2009; Schneider, 2002). This

is particularly true in South Africa where the second economy plays a major role in the national economy (Ligthelm, 2006; Kirsten, 2006). None-the-less it is crucial to measure the frequencies and the magnitude of non-mainstream areas such as the second economy to enable the making of effective and efficient policy and economic decisions (Schneider, 2002). The majority of preferred approaches to measure the second economy make use of various economic and other proxy indicators that contain information about the development of the informal economy over time (Schneider, 2002).

Taking into account the development environment in South Africa where decisions have to be made without the luxury of time and resources, the importance of high quality data at a local level and lack thereof in practise, the author is of the opinion that the right question to ask is not why there is a lack or the reason thereof, but to explore alternative measures in which the data can be generated and verified. The dissertation thus sets out to explore alternative approaches that can shed light onto these aspects. Alternative methods in which to measure the local economy not only suggest a fertile area for research, especially in areas where conventional methods fall short in terms of time, cost and accuracy, but are vital for effective, accurate and sustainable planning in South Africa.

## 3. An epistemological foundation of economic data

***"Forget about exports and import and profits***
***and such neoclassical notions.***
***Let's balance the product produced from this planet***
***with the waste flushed into our oceans.***
***How many hospital beds for each citizen?***
***What leave for the birth of each child?***
***How many bookshops? How many cinemas:***
***What is the street price for a smile?"***

***-- Nick Horn as quoted by Horn (1993:6)***

Throughout history professional economists have made policy recommendations that are entirely opposed and produce conflicting economic forecasts (Hausman, 2008). That the policymakers and public have begun to question economist's credibility is not surprising and it is thus important that economists begin to question the ultimate foundation of their science (Mill & Uselton, 1976; Spash,

2012). In the following chapter an overview of the arguments for an epistemological foundation for economic research is presented. The discussion does not stretch into the philosophical foundations of epistemology, but rather focus on the practical implications that these concepts have on economic indicators and the uses thereof in order to predict and measure the economy (Horn, 1993).

What do we know about the economy? How do we know what we know? How did we acquire this knowledge? And what is the nature of this knowledge? These are some of the important epistemological questions that should be asked in terms of economic data, and may shake the foundations of fundamental economic theories (Spash, 2012).

Unfortunately for economic theorists, data in many instances contradict the trends that economic theories predict (de Marchi 1970; Hausman, 2008). Even the foundations of the discipline of economic history are not yet fully secure or beyond controversy (Mill & Uselton, 1976; Little, 2006). Most of the academic debates among professional economist stem from the notion that economists draw conflicting results from the same set of data (Mill & Uselton, 1976). Although everyone may not be wrong, someone at least, must be. That statistics can prove anything is a popular recognition of this truth Mill & Uselton (1976).

There is a historic view within the social sciences that only a statistical analysis of quantitative data represents real scientific knowledge of the social world (King *et al*, 1994). But the lack of quantitative data in providing an accurate picture of economies at a local level is based on the absence of an account for human experience. If we look at the example of employment and minimum wages as discussed by Hausman (2008:334), we find that many economic models fail to recognise the everyday human experiences.

> *"The statistical data are ambiguous concerning the relationship between minimum wages and unemployment of unskilled workers; and since the minimum wage has never been extremely high, there are no data about what unemployment would be in those circumstances. On the other hand, everyday experience teaches one that firms can choose among more or less labour-intensive processes and that a high minimum wage will make more labour-intensive processes more expensive. On the assumption that firms try to keep their costs down, one has good though not conclusive reason to believe that a high minimum wage will increase unemployment."*

Hausman (2008) argues that there is value in personal experience that cannot be portrayed using current economic models. A philosopher can add a valuable contribution to the development of a scientific field by helping shed light on underlying foundations of knowledge (Little, 2006). Introspection may thus be the only valid source of knowledge of universal truths concerning human action (Mill & Uselton, 1976).

> ***"The goal of economic analysis is to understand and to explain the ultimate data: human actions."***
>
> ***-- Mill & Uselton (1976:66)***

## 4. Economic Data and Planning

While the literature suggests that reliable data is a key element in the planning environment (Coetzee, 2009; Lai and Ho, 2002; Okpala, 2001; Krebs and Hamilton, 2009), little research has explored alternative methods that can provide or verify quality data. A number of authors have written about the importance of economic data and planning including Zietsman (2006), Okpala (2001) and Coetzee (2009). Coetzee (2009) argues that the value of the plan is highly dependent upon the quality of the data utilised in the early phases of the strategic planning process. Okpala (2001) agrees with Coetzee and argues that information is crucial to sustainable human settlement planning and development, and further believes that effective planning revolves around statistics. Eva Asplund, country director of the Swedish International Development Cooperation Agency (SIDCA), are of the opinion that statistics are extremely important in assisting the private sector in business decisions, as well as for researchers, academics and legislators to have firm foundations to develop public policy (ATN, 2010).

In a more holistic view of planning data, Cortright and Reamer (1998) describes the role of credible data in planning in more detail and states that the effectiveness of a plan is fairly limited unless there is a clear understanding of the local economy which can only be achieved on the basis of trustworthy local data. Coetzee (2009) concurs and states that local economic, socio-economic and demographic related data is a crucial resource in planning and that strategic planning based on incorrect and/or out-of-date information leads to abject failure. Not only is relevant accurate data needed to develop local economic strategies (Coetzee, 2009), but is also vital for the evaluation and monitoring of plans and policies (Zietsman *et al*, 2006).

## 5. Lack and Limitations of Data

***"Question: Why did God create economists?***

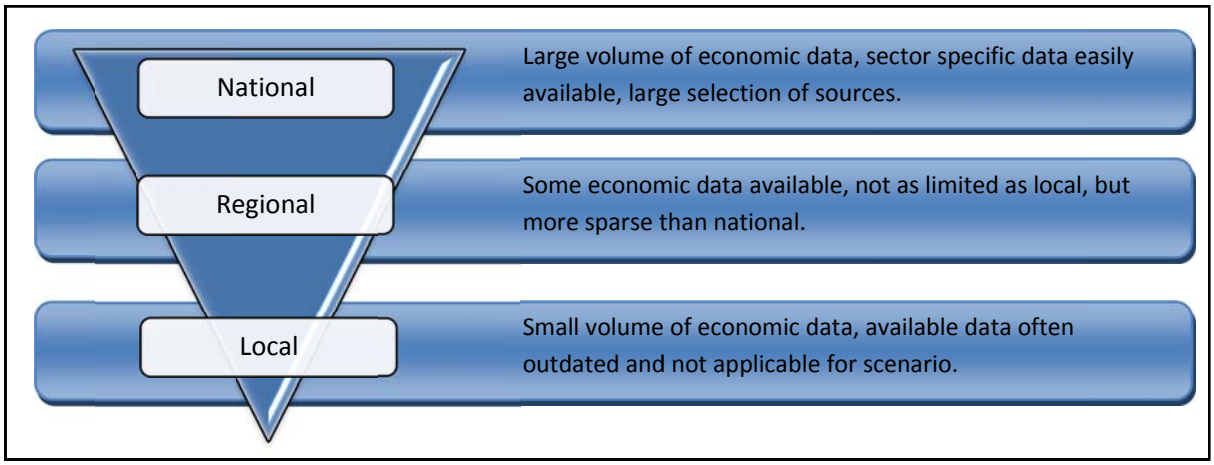
***Answer: To make weather forecasters look good…"***

***-- Unknown (2012)***

Although a wide range of economic phenomena are measured worldwide at national level, there has been limited economic research on a local and sub-local level (Cortright & Reamer, 1998). Cortright and Reamer (1998) further argue that the smaller the area of focus, the sparser the data becomes and that data below national level is very difficult and expensive to obtain.

Figure 1.1 illustrates the limitations of data in terms of scale as discussed by Cortright and Reamer (1998) and Coetzee (2009).

**Figure 1.1: Economic data and Scale**




As illustrated in the figure above, the availability and applicability of economic data decreases as the area of focus increases. For example, Coetzee (2009) is of the opinion that the data sources available in South Africa on a local level lack dependability and relevancy, and continues to argue that within a 'statistical data vacuum' the quality and effectiveness of specifically Local Economic Development in South Africa is debatable at best.

A number of local government Integrated Development Plans identify the lack in up-to-date data as a major obstacle for local government planning processes for example the Endumeni Local Municipality IDP (2009), the False Bay Local Municipality IDP (2010), the Maruleng Local Municipality IDP Review

(2008) and the Ugu District Municipality IDP (2007). In the Endumeni Local Municipality Draft IDP Review (2009) it is argued that most official demographic and economic data comes from the last South African Census of 2001 conducted by Statistics South Africa (StatsSA) and this data is largely out-dated for economic analysis purposes and is questionable in terms of its creditability. The authors of the False Bay IDP (False Bay, 2011) identified the same challenge and argued that the inconsistencies in the census 2001 data paint a distorted picture of both the economic and social status quo on a local level. The models used in the more up-to-date StatsSA 2007 household surveys are considered to be problematic in terms of its accuracy and coverage perspective (Endumeni LM, 2009).

Apart from Statistics South Africa, other key data sources from which local economic data is sourced in South Africa include the South African Reserve Bank, the South African Revenue Service, private institutions and the Bureau of Market research. Although these sources can provide vital economic information in some scenarios, they contain major limitations. Table 1.1 provides an overview of the foremost economic data sources, as well as an outline of the key limitations of these sources.

**Table 1.1: Current Economic Data Overview**

| Source | Overview | Limitation |
|---|---|---|
| **Statistics South Africa** | Stats SA aims to provide relevant and accurate statistics which can inform users on the dynamics in the economy and society. The main sources of data are the 1996 and 2001 census data and the 2007 community survey data. | • The focus is on **national data** and information only, with a small number of publications also including provincial data.<br>• The data is of a **retrospective nature**, with limited relevance to the **local economy**. |
| **South African Reserve Bank** | The Reserve Bank collects, processes, interprets and publishes economic statistics. Key sources of data include Quarterly Bulletins and Annual Economic Reports. | • The SARB only focuses on **national data** and information.<br>• Even though it is possible to indirectly use the data, the **reliability** of such indirect use is always questionable. |
| **South African Revenue Service** | The South African Revenue Service (SARS) is a revenue and customs agency and has no mandate with regards to the supply of data and information. | • Can **potentially** offer high quality, up-to-date data as SARS collects a variety of taxes, for example income tax, skills development levies and value added tax and turnover tax.<br>• However, the provision of the data to the public is not in its **current mandate**. |

| Source | Overview | Limitation |
|---|---|---|
| **Private Firms** | Private institutions including Global Insight and Quantec derive their income from supplying data and information. The bulk of the data is modelled on Stats SA data. | • The data and information are **relatively expensive**.<br>• The **reliability** of the data and information are in some cases questionable as the data is modelled data and not primary data. |
| **Bureau of Market Research** | The Bureau of Market Research (BMR) was founded by the University of South Africa (UNISA) as a research institute and is involved in socioeconomic research and investigations. | • The data and information are **national** in most cases.<br>• The data is **very specific** and therefore are in most cases not relevant to the general local economy. |

Table 1.1 indicates that although a range of data sources are available, the data sources all lack in terms of a hand-on practical application to everyday planning challenges. Key up-to-date economic data, such as provided by Stats SA and the Reserve Bank is only available at national level. Data available at local level from Stats SA is outdated, as the most up-to-date data publication is the 2001 Census (the results of the 2011 Census are only expected in 2013/2014). Private sources such as Quantec and Global Insight are relatively expensive and the reliability in terms of the economic modelling has been questioned by economist, including Coetzee (2009). It is thus clear that there is a major lack of reliable and cost effective local economic data.

## 6. Proxy Indicators

In the light of the importance of accurate up-to-date data for planning, the lack of the aforementioned data in South Africa and the high cost associated with conducting project-specific primary research, there is a need to identify means of 'accessing' data of higher quality that is more up-to-date. One such way is the use of '**proxy indicators**' as **indirect measures that represents the economy in the absence of economic data** (UNDP, 2002). A proxy indicator can be any activity, variable or phenomenon that can represent a 'condition' for which there is no existing data (UNDP, 2002; Landen, 2011).

Proxy indicators have become widely used in many different academic fields and can play a useful role in identifying trends and contributing to the process of policy formulation (Von Schirnding, 2002; Lee &Wang; Rozema *et al*, 2001; Todorov, 2000; Bumann, 2010). One example that is particularly helpful in the light of this dissertation is the use of a dipstick to measure the condition of your vehicles engine. In

order to acquire a comprehensive understanding of the condition of your engine, it will be necessary to perform a full service of the entire engine by a qualified technician. But to perform a full service is time and cost consuming. However, there are more cost and time effective manners which can be used to obtain an indication of the condition of your engine, for example the dipstick. The dipstick gives an indication of the form of the engine, and is a cost, time and resource effective manner in which to gain an overview of the condition of the engine. The dipstick will never replace a full service, but can give a good indication of the current condition. In the same manner proxy indicators could give a good indication about the socio-economic circumstances in a local economy in a time and cost effective manner, but will never replace a full census.

In the light of this particular dissertation, a possible indicator could include for example fluctuations in the property market as an indicator of the economy. Thus for a specific shift in the cycle of the property market, a predicted change will occur in the general economy, or vice versa. In that light, proxy indicators can provide valuable insight into the growth and composition of local economies where up-to-date quality data is not available. As conventional economic indicators fail to quantify the extent of the second economy, proxy indicators can provide valuable insight into the trends of the second economy as proxy indicators have the ability to measure both the informal and the formal economy (Schneider, 2002; Ligthelm, 2006). From an epistemological point of view, proxy indicators can also provide insight into situations where traditional economic modulations fail to adequately explore a phenomenon, and can further use every day human experiences to provide insight into complex economic situations (Mill & Uselton, 1976; King *et al*, 1994).

## 7. Problem statement

***It's not perfect, but it's the only plan we've got…***

In view of the lack of up-to-date economic data on a local level, the vital importance of such data for the policy environment and the possibility of a proxy indicator to provide insight into the data in question, the phenomenon certainly suggests a fertile area for research. The dissertation seeks to explore whether it would be possible to use proxy indicators to measure local economic conditions and to identify a set of proxy indicators that accurately portray the economy. With this aim in mind, the study focuses on the analysis and testing of a wide range of proxy indicators that can be used as a basis for effective economic measurement on a local in South Africa.

The study does not aim to answer all the questions regarding the activities of local economies in South Africa, nor does it provide a fool proof alternative to other means of data collection, but can offer a valuable tool to analyse the state of the local economy. Although the theme suggests a fertile area of inquest, the study focuses on a limited number of indicators which can easily be sourced at a local level in South Africa. The study is an exploratory study and although the study has a number of limitations it can explore the phenomenon to such an extent that future in-depth research can be possible.

In the light of the problem statement discussed above, the study aims to answer the following research question.

**"Do proxy indicators mirror microeconomic conditions at the local level in South Africa? "**

## 8. Value of the Dissertation

Although the analysis used in the study is based on the relationship between a set of variables and the economy, it is not the aim of the researcher to provide a comprehensive economic theory, but to understand the relationship between variables and local economies in South Africa, in order to envision the behaviour of the local economy more effectively. Even though all economic predictions and theories have limitations, the dissertation can provide insight into the behaviour of the economy in an environment that urgently seeks and requires quality up-to-date data.

Leamer (2007) argues that there is a definite value in studies of the economy by researchers who are not economists, in the light that the researcher is not hampered by the heavy conceptual burdens that most economists seem to carry. He further states that Keynesian thinking, monetarism, rational expectations and real business cycles all suffer from the same problem – they consist of too much theory and not enough data and common sense (Leamer, 2007).

In the light of the above discussion, the use of proxy indicators to measure the economy on a local level has the following core advantages:

- Proxy indicators can provide a framework for the effective measurement of the economy at a **local level** and even sub local level.
- Proxy indicators can measure the economy in a **short timeframe** whereas a full economic survey takes a long time to complete.
- Leading proxy indicators can be used to develop a model which can be used as a basis for **economic forecasting**.
- Proxy indicators can provide data more **cost-effective** than other more expensive economic databases.
- The survey of the proxy indicators can be conducted by a wide range of individuals, even those with **limited experience** in economic studies.
- Proxy indicators utilise **"the knowledge tradition"** and accordingly invests in local and traditional knowledge.
- Proxy indicators can include the movement and activity of the **second economy**.
- Proxy indicators can be used in **data scarce areas**, especially in rural areas and the third world where conventional economic indicators are limited.

## 9. Research Framework and the Two Questions

***Live your questions now, and perhaps even without knowing it, you will live along some distant day into your answers.***

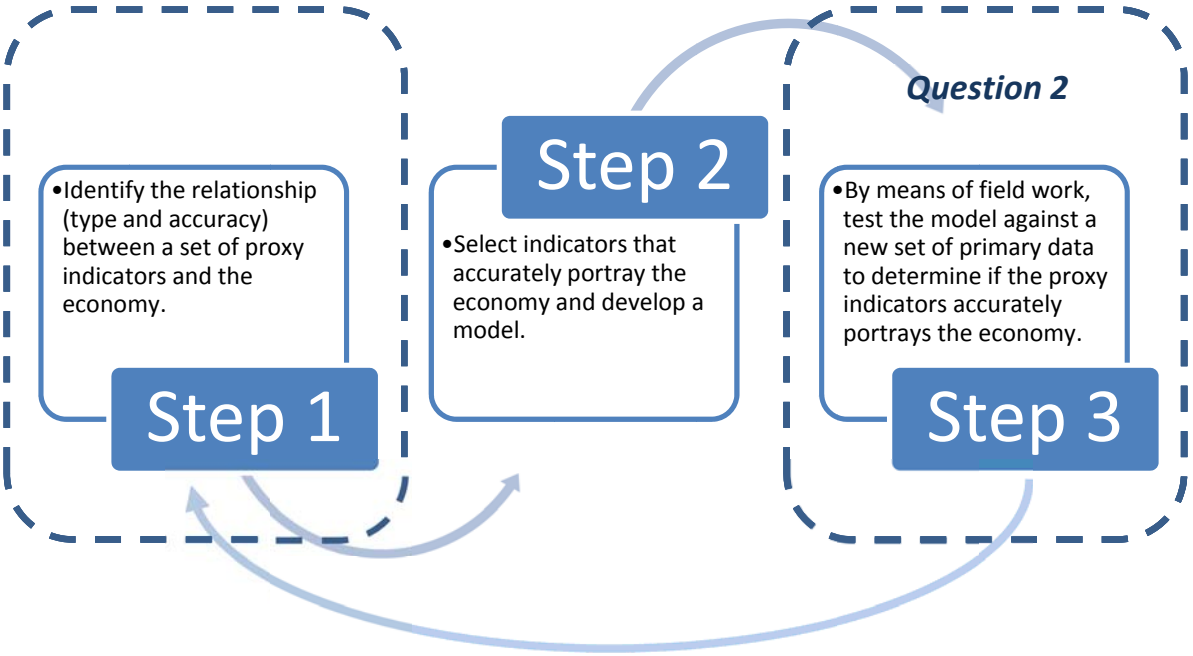
***--Rainer Maria Rilke (1929)***

The research is structured in terms of two questions. The first section (**Question One**) focuses on the comparison of the relationship between a number of proxy indicators and the economy in order to identify a set of proxy indicators that mirrors the economy. The second section (**Question Two**) tests the indicators identified in the first section to that of the economy of three study areas.

The study followed an inductive research method and the first section is based on the collection and analysis of secondary data (Blaikie, 2007). From the results of the first section, a model was derived using inductive logic which was tested against a new set of primary data obtained in field research in the second section of the study. As indicated in chapter one, the researcher aims to explore an alternative and innovative way to measure local economies. Although the use of the statistics in the first section of the study is not necessarily an innovative approach, it was required as a basis on which the second section could be based.

The process is graphically illustrated in Figure 1.2 below.

**Figure 1.2: Research Framework**




## 10. Structure of Dissertation

***Who questions much, shall learn much, and retain much.***

***-- Francis Bacon (1595)***

The structure of the dissertation is set out in Table 3.1 below. It is clear that the dissertation structured in terms of the research framework set out above. The first section includes the introduction to the study, the theoretical framework and the current chapter. The second section includes the methodology, testing and results of the analysis of a range of proxy indicators compared to the economy. Section three contains the methodology and results of the empirical study conducted on the proxy indicators identified in section two of the study in three study areas. Section four concludes with an overview of the findings and recommendations for further exploration.

**Table 1.2: Dissertation Structure**

| | |
|---|---|
| **Section 1: Introduction** | |
| **Chapter 1: Introduction** | Commences with the problem statement, aim, limitations and value of the study. |
| **Chapter 2: Theoretical Framework** | Provides the main theoretical perspectives related to study. |
| **Section 2: Proxy Indicator Identification** | |
| **Chapter 1: Methodology** | Provides an overview of the research methodology followed in Section 2 of the study. |
| **Chapter 2: Property-Related Proxy Indicators** | Provides an analysis and comparison on selected property-related proxy indicators. |
| **Chapter 3: Retail Related Proxy Indicators** | Provides an analysis and comparison on selected retail related proxy indicators |
| **Chapter 4: Banking-Related Proxy Indicators** | Provides an analysis and comparison on selected banking-related proxy indicators |
| **Chapter 5: Additional Proxy Indicators** | Provides an analysis and comparison on selected proxy indicators not related to property, retail or banking. |
| **Chapter 6: Research Findings** | Provides an overview of the findings of the section and identifies the accurate measures. |
| **Section 3: Empirical Study** | |
| **Chapter 1: Methodology** | Provides an overview of the research methodology followed in Section 3 of the study as well as an overview of the study areas selected for the empirical research. |
| **Chapter 2: Empirical Findings** | Provides the findings of the model tested in the field work. |
| **Chapter 3: Recommendations** | Provides concluding arguments and recommendations about the use of proxy indicators to measure the economy. |
| **Section 4: Conclusion** | |
| **Chapter 10: Conclusion** | Concludes with the main research findings. |

## 11. Aim and Use of the Dissertation

The aim of the dissertation is not to give a list of all the proxy indicators that can effectively portray the economic on a local level in South Africa, but to explore alternative ways in which a local economy can

be understood and trends can be identified. As such, the document and research findings provide a valuable framework in which a model can be developed to portray local economic conditions. Proxy indicators can be used in conduction with other economic measures to provide a more accurate description of the economy, and can provide data in a more cost and time effective manner.

> Leamer (2007) argues that "*medieval empirics came to the conclusion that blood-letting helped (ailing individuals) because the health of the patients often improved after the blood was let, but we know now that temporal orderings do not reveal causality. For valid causal conclusions, we need an experiment; we need a control group and a treated group. When all we have are non-experimental data, correlation is in the data but causation is in the mind of the observer. With only temporal orderings and no experimental evidence, we do what empirics do: we rely on stories.*"

The dissertation tells a story. A conceptual story that explores the use of alternative methods for data collection. The exploration of the topic may not only lead to the discovery of valuable insights, but some value may be hidden on the journey leading up to these insights.

# Chapter 2: Theoretical Framework and Literature Review

***"There is no such thing as a stupid question. Questions are important. In a study it was found that a young child asks 125 questions a day. A young adult asks a mere six."***

***--Stefan Joubert (2012)***

## 1. Introduction

Even though the use of proxy indicators is regarded as a common method in a number of specialist academic studies (Rozema et al, 2001; Todorov, 2000) and practical applications (Von Schirnding, 2002), to the authors knowledge there have yet been a debate in the academic fraternity regarding the use of a wide range of proxy indicators to measure the local economy. While literature in a broad sense suggests that proxy indicators can provide valuable insight into the economy (Rabie, 2011; Wong 2002: 1839; Benin & Randriamamonjy, 2008), little research has explored the possibilities offered by proxy indicators.

As discussed in Chapter 1, if one considers the lack of up-to-date economic data on a local level, the vital importance of such data for the policy environment and the possibility of a proxy indicator to provide insight into the data in question, the phenomenon certainly suggests a fertile area for research. However, as there is not an existing academic framework available to investigate regarding the research question, the chapter focuses on two theoretical divisions identified as a basis for the study. Firstly the underlying economic concepts underpinning the use of proxy indicators in economics, and secondly the use of proxy indicators in selected practical applications. It is in the light of the above that the following chapter commence with a brief overview of the fundamental economic concepts and arguments used in the dissertation where after key studies and literature regarding the use of proxy indicators are discussed.

## 2. Definitions

***"To define is to limit."***

***--Oscar Wilde (1890)***

Table 2.1 provides definitions for key concepts used in the remainder of the dissertation.

**Table 2.1: Key Concepts and Definitions**

| Concept | Definition |
|---|---|
| Acyclic indicator | An acyclic economic indicator is an indicator that has no relation to the economy (Moffatt, 2012). |
| Coincident indicator | A coincident economic indicator is an indicator that moves in correlation with the economy (Moffatt, 2012). |
| Constant prices | Prices that are expressed as a constant value over time without the effect of inflation (South African Reserve Bank, 2012 ) |
| Consumer goods | Physical commodities purchased by a household or individual to satisfy their needs and may be durable or nondurable (Britannica Encyclopaedia, 2012). |
| Correlation | Correlation refers to the statistical relationships involving dependence between variables and is expressed in terms of a correlation coefficient (Britannica Encyclopaedia, 2012). |
| Correlation analysis technique | Can be any one of a number of statistical methods used to calculate the correlation between variables (Farlex Dictionary, 2012). |
| Correlation coefficient | A correlation coefficient is an indication of how strong a linear relationship exists between two numeric variables (Farlex Dictionary, 2012). |
| Counter-cyclic indicator | An indicator that moves in the opposite direction as the economy (Moffatt, 2012). |
| Durable Goods | Goods serving their usefulness for a long period of time (Sullivan & Sheffrin, 2003) |
| Economic cycle | Fluctuations in economic activity over a specific period of time (Britannica Encyclopaedia, 2012). |
| Economic indicator | A statistic used to predict future trends in an economy (Investopedia, 2012) |
| Inductive logic | Reasoning that evaluates propositions that are abstractions of observations. It is commonly construed as a form of reasoning that makes generalisations based on individual instances s (Kneale & Kneale, 1962: 36). |

| | |
|---|---|
| Inductive research | Research based on inductive logic (Kneale & Kneale, 1962). |
| Lagging indicator | A lagged indicator does not change direction until a few quarters after the economy (Moffatt, 2012). |
| Leading indicator | A leading indicator changes before the economy changes (Moffatt, 2012). |
| Non-consumer goods | Goods mainly used in production, including goods for agricultural production and construction materials (Britannica Encyclopaedia, 2012). |
| Non-durable goods | Non-durable goods are used or consumed for only a short span of time (Britannica Encyclopaedia, 2012). |
| Pro-cyclic indicator | A pro-cyclic economic indicator moves in the same direction as the economy. If the economy grows, the indicator will increase, whereas if the economy is in a recession, the indicator will decrease (Moffatt, 2012). |
| Proxy indicator | A proxy indicator can be any activity, variable or phenomenon that can represent a 'condition' for which there is no existing data (Moffatt, 2012). |
| Quantitative data | Quantitative data is measured or identified on a numerical scale and can be analysed using statistical methods (Treiman, 2009). |
| Semi-durable Goods | Goods that is neither perishable nor lasting (Britannica Encyclopaedia, 2012). |
| Time-series analysis | Time-series analysis involves plotting data trends over a specific time, for a specific geographic area for a specific unit of analysis (Gershenfeld, 1999). |

## 3. Macroeconomic Fundamentals

The field of economics is complex (Yaneer, 2003) and there are a variety of specialities and fields of study (Davis, 2006; Arthur, 2008), although the majority of these fall outside the scope of this dissertation. The understanding of macroeconomics is however essential for microeconomics (and the understanding of this dissertation) as the behaviour of the economy as a whole influences the lives and welfare of the economy at a local level (Fourie and Burger, 2009:9). The subsection focuses on the aspects of economics that is deemed central by the author for the understanding of the dissertation and include two core economic concepts, economic cycles and 'elasticity and consumer behaviour', both of which are described in the following sub-sections.

## 3.1. Economics

There are a wide range of definitions for economics. As Ferber and Nelson (1993) have pointed out, "economics increasingly has come to be defined not by its subjects matter but by a particular way of viewing the world". For the scope of this dissertation economics can loosely be defined as a system of resources and activities aimed at achieving its optimal use related to among other aspects, the production and distribution of goods and services in a particular geographic area.

## 3.2. Economic cycles

It is important to study economic cycles (macroeconomic conditions) of an area, as it will directly influence the behaviour of the local economy (consumer behaviour). The term economic cycle refers to aggregate economic activity and fluctuations over a specific period of time (Roux, 2008:25), which is measured by a wide variety of indicators including output sales, employment and income (Hall, 1990:2). These fluctuations take place in the long-term growth of an economy, and typically involve shifts over time between periods of relatively rapid economic growth, and periods of relative stagnation or decline (Sullivan & Sheffrin, 2003).

## 3.3. Consumer Behaviour and Elasticity

For the scope of the dissertation it is important to analyse the influence of the economy on consumer behaviour and demand elasticity, as both plays a major role in the relationship between proxy indicators and the economy. For example, if a study would analyse the possibility of hardware sales as a proxy indicator for the economy, consumer behaviour (in terms of hardware sales) as well as elasticity (of hardware products) plays a major role in the manner in which the proxy indicator react to economic cycles. Consumer behaviour can influence the consumer to buy less or more products or influence the consumer to change between brands. Elasticity in turn determines the percentage change in hardware sales when the economy changes a specific percentage.

A number of authors including Todd (2008), Clifford (1985), Bohlen *et al* (2009) and Romer (1990) have discussed the influence of economic fluctuations on consumer behaviour. In times of economic growth,

consumers spend more on goods and services because they are of the opinion that their economic circumstances will improve. In times of economic stagnation and recession, consumers have a negative view on their economic circumstances and become more inclined to delay purchases and buy less often (Todd, 2008).

Bateleur Khanya in association with University of Cape Town compiled a *Recession Survey* in order to measure how consumer behaviour of South Africans was influenced by the 2007 economic downturn. The study team conducted interviews with a sample of more than 1,000 consumers in South Africa (Todd, 2008) and identified the following trends in terms of South African consumers:

- Consumers will **make trade-offs** to keep up appearances. They might share lifts to work in order to be able to afford fashionable clothing.
- **All consumers change behaviour**. As the poor change their behaviour, so too do the well-off.
- Consumers **seek and buy good value items**. Consumers take longer to make decisions about the purchase of durables, and buy on price.
- Consumers **take refuge in their homes**. Meals and entertainment are enjoyed at home more frequent.
- Consumer **needs become more basic**. Flashy and up-to-date products make way for dependable and durable products.
- Consumers **first spend on what they regard as being essentials.** Any purchase that could be regarded as being a luxury gets put off.
- **Consumers become less loyal**. They shop around more looking for the best deal. (Todd, 2008)

Bohlen, *et al* (2009) conducted similar research regarding consumer behaviour in the United States of America, involving 2,672 consumers. Eighteen present of consumers switched to lower-priced brands in the recession and the majority stated they no longer preferred higher-priced products. Clifford (1985) examined the routine of shopping attitudes and behaviour of two relatively disadvantaged groups in Cardiff and found that in a recession the more affluent members of the public change their habits more than the poor.

In times of economic growth, consumers will favour a perceived value in a premium-brand product (Product A), over the product of a more basic brand (Product B), despite the premium products higher price. In a recession, consumers become less willing to pay more, and the preferences of some consumers begin to shift from Product A to Product B (Bohlen, *et al*, 2009).

The Economic Research Division (2009) further investigated the effects of the economic downturn on the agricultural sector and published "The Global Economic Slowdown: How Has the Agricultural Sector Growth Been Affected?". The study found that the manufacturing and retail sectors were the hardest hit by the downturn, and that consumer spending slowed considerably (Economic Research Division, 2009). The study further identified a change in consumption pattern of selected agricultural products, particularly meat and grains. In times of economic stagnation and recession consumer preference shifted from beef and mutton to poultry and other low cost meat products.

If consumer behaviour and elasticity are so clearly influenced by economic fluctuations as discussed by Todd (2008), Clifford (1985) and Bohlen *et al* (2009), it would be possible to argue that a change in one (the economy) would incur a change in the other (the sale of meat products). Thus a change in the economy will have an impact on the behaviour in the market, and therefore a change in the market can be an indicator of the economy.

## 4. Indicators

### 4.1. Economic Indicators

According to the Oxford Online Dictionary (2011), an economic indicator is '*a statistic used to predict future trends in an economy*'. Economic indicators are categorised according to their relationship to the economy as pro-cyclic, counter-cyclic or acyclic (Sullivan & Sheffrin, 2003:314). A pro-cyclic economic indicator is one that moves in the same direction as the economy (Baumohl, 2005). If the economy grows, the indicator will increase, whereas if the economy is in a recession, the indicator will decrease (Franka, 2011). A counter-cyclic economic indicator is one that moves in the opposite direction as the economy, for example the unemployment rate increases as the economy decreases. Finally an acyclic economic indicator is one that has no relation to the economy and is generally of little use in terms of economics (Franka, 2011; Sullivan & Sheffrin, 2003:314).

Economic indicators can further be classified as leading, lagging, or coincident in terms of their timing with regards to economic cycles (Roux, 2008:30; Mohr, 2007:70). Leading economic indicators are indicators which change before the economy changes such as the stock markets (Franka, 2011; Roux, 2008). A lagged economic indicator does not change direction until a few quarters after the economy, such as the unemployment rate, and a coincident economic indicator is one that moves in correlation with the economy such as GDP (Franka, 2011).

## 4.2. Proxy Indicators

Proxy indicators are widely used in a number of academic fields (Von Schirnding, 2002) including economics (Lee &Wang, 2011; Filardo, 1994; Hussey, 1992), medicine (Nelson *et al*, 1990; Sneeuw *et al*, 1997; Todorov, 2000), science (Filley *et al*, 2006; Ding *et al*, 1999; Darling, 2004) and environmental studies (Rozema *et al* 2001).

A proxy variable is something that might not in itself be of interest, but can represent a 'condition' for which there is no existing data (UNDP, 2002). A variety of socio-economic statistics can be used as proxy indicators to predict future economic conditions (UNDP, 2002) and can provide an immediate indication of progress in the short-term while data for the theory driven indicators is developed (Rabie, 2011). Possible indicators can for example include the number of start-up businesses as a proxy indicator for the level of entrepreneurship in a local economy (Rabie, 2011), or insurance premiums as a proxy indicator of a residents perception of safety (Wong 2002: 1839).

In the light of the importance of accurate up-to-date data for planning, the lack of the aforementioned data in South Africa and the high cost associated with conducting project-specific primary research, there is a need to identify means of 'accessing' data of higher quality that is more up-to-date. One such way is the use of 'proxy indicators' as indirect measures that represents the economy in the absence of economic data. Proxy indicators possess the power to play a useful role in identifying trends and contributing to the process of policy formulation (Von Schirnding, 2002).

The above-mentioned arguments provide a basis to explore the use of proxy indicators to measure the economy. Proxy indicators to provide valuable insights into the growth and composition of local economies where up-to-date quality data is not available. As conventional economic indicators fail to

quantify the extent of the second economy, proxy indicators have the ability to provide valuable insight into the trends of the second economy as proxy indicators have the ability to measure both the informal and the formal economy. From an epistemological point of view, proxy indicators have the ability to provide insight into situations where traditional economic modulations fail to adequately explore a phenomenon, and can further use every day human experiences to provide insight into complex economic situations.

## 4.3. Proxy Indicator Identification

To identify proxy indicators, a common commencement is the literature on economy wide models and how various sectors of the economy interact with each other (Benin & Randriamamonjy, 2008). The authors are of the opinion that even though a proxy indicator model is not appropriate for making conclusions regarding any cause–effect relationships, it is important to have proxy indicator variables that have strong logical and empirical links (Benin & Randriamamonjy, 2008). US Aid (1998) published supplementary guidelines for selecting proxy indicators and states that the level of accuracy, currency, and reliability is vital in selecting proxy indicators. According to the Western Cape Provincial Wide Monitoring and Evaluation System (Provincial Government of the Western Cape, 2009:2), indicators should further be direct, objective, practical, and adequate with a healthy measure of common sense and reasonableness.

From an epistemological point of view there are an unlimited number of proxy indicators that could potentially provide valuable economic data. It is proposed that the selection should be guided by the epistemological principle that "concepts are not to be multiplied beyond necessity…nor are they to be integrated in disregard of necessity" (Peikoff, 1986:96). For example, with regard to fuel, when discussing factors affecting the fuel price, it is logical to simply rationalise away demand and supply and simply use the international oil price. But when discussing external factors that have an effect on the fuel sector, a change in the demand and supply is likely to be associated with (and partially cause) a change in the fuel price.

Thus from an epistemological foundation the key of selecting indicators is to focus on the indicators that are most relevant for causing a certain event, the indicators that best reveal the existence of a certain scenario taking place right now, and the most likely relevant effects (Karlsson, 2010).

## 5. Practical applications of Proxy Indicators

***"Ask me no questions, and I'll tell you no lies."***

***--Oliver Goldsmith (1773)***

The following subsection gives an overview of a number of academic studies and legislative documents in which proxy indicators have been used to measure external attributes. Each study is structured around the following headings:

- **Proxy:** the use of indicator ***a*** to indicate ***b***
- **Overview**: an introduction and brief overview of the study.
- **Why**: the need for proxy in the study.
- **How**: how proxy indicators was used to collect data and make important assumptions in the study.
- **Conclusion**: Important lessons learnt with regards to the use of proxy indicators in the study and if the proxy indicators could be used successfully.

After an overview of the practical applications of proxy indicators the studies are discussed in terms of the influence of the studies on this specific dissertation, (1) what is learnt from the studies from an academic perspective, and what not and the (2) manner in which the studies influenced the thought process.

**Table 2.2: South Africa: Provincial Wide Monitoring and Evaluation System**

| South Africa: Provincial Wide Monitoring and Evaluation System (2009) | |
|---|---|
| **Proxy** | *For example*: Estimated Municipal Infrastructure Grant [MIG] expenditure as a proxy indicator for bulk infrastructure maintenance. |
| **Introduction** | The Western Cape provincial government identified a need for an integrated monitoring and evaluation system that is able to assess and identify the reasons for the department's performance. The Provincial-wide Monitoring and Evaluation System (PWMES) was developed for improved systems and processes in the quest for improved service delivery (Provincial Government of the Western Cape, 2009:13). |

| | |
|---|---|
| **The need for proxy indicators** | A large amount of high quality, up-to-date data is required for the successful implementation of the PWMES (Provincial Government of the Western Cape, 2009:13). The department found that indicators at a provincial level are often too distant from the source of development at a local level to form tangible links. For this purpose indicator frameworks were developed as essential tools to measure the progress in the province in relation to the provincial strategies and policy areas (Provincial Government of the Western Cape, 2009:13). The ambitious scale of the system meant that the selection of appropriate indicators was a difficult and intricate exercise and resulted that the project team only made use of proxy indicators when it was evident that: (1) the data for the direct indicators is not completely unavailable, (2) data collection would be too costly, or (3) it is not feasible to collect data at regular intervals. |
| **Methodology** | The methodological soundness of the indicator development process in selecting good development indicators was essentially a set of criteria as identified within the requirements of the National Statistical System of Statistics South Africa (Provincial Government of the Western Cape, 2009:2). The criteria for selecting appropriate indicators were based on the: (1) relevance of the indicators, (2) how clear and unambiguous the indicators are, (3) the availability of the indicators, (4) how adequate the indicators are to provide a sufficient base and a trend analysis to serve as strategic management information, (5) reliability of the indicators, (6) accuracy of the indicators, (7) accessibility of the indicators, and (8) the timeliness of the indicators. Much emphasis was placed on how important the indicators are in measuring the extent of development in the province (Provincial Government of the Western Cape, 2009:2). |
| **Conclusion** | Proxy indicators were used as a result of the unavailability of the data, and the high cost associated with producing quality, up-to-date data. Proxy indicators were then selected on the basis of the National Statistical System guidelines, and provided vital information that would otherwise be unable to obtain in the scope of the project. |

**Table 2.3: Ghana: Proxy Indicators for Environmental Health**

| Ghana: Proxy Indicators for Environmental Health (1998) | |
|---|---|
| **Proxy** | Water supply, air quality, sanitation and solid waste removal as a proxy indicator of environmental health. |
| **Introduction** | The study recognises that government organisations, NGOs and other actors on a local level are interested in developing environmental health indicators. Such indicators, when applied to residential areas on a local area can assist in identifying and prioritising problems, and monitoring improvements (Songsore, *et al*, 1998). The aim of the project |

| | |
|---|---|
| | was to identify a set of proxy indicators to measure the environmental health status of residential areas in the Greater Accra Metropolitan Area. The indicators were developed to be a practical tool to be used in an area with a lack of data (Songsore, *et al*, 1998). |
| **The need for proxy indicators** | According to Songsore *et al* (1998 the use of proxy indicators in the study is justified by: (1) the need to target and monitor environmental health improvements, (2) the lack of environmental health indicators at the local level, and (3) the cost of collecting data through formal surveys. |
| **Methodology** | In order to provide a better basis for environment and health planning and management, standard methodology was designed to provide a process for the routine monitoring of the environmental health issues (Songsore, *et al*, 1998). The methodology was based on a three-step process that was developed to enable the study team to produce a list of quality proxy indicators: **Step 1**: development of a profile of proxy environmental health indicators, **Step 2:** development of a method for weighting the indicators in consultation with a statistical experts, and **Step 3:** discuss and validate the indicators by means of informal consultations between the study team and an inter-sectorial experts (Songsore, *et al*, 1998). |
| **Conclusion** | The process was designed to be a low cost, locally managed and participatory process. Songsore *et al* (1998) argue that although the scientific validity of the indicators can be questioned, it does not invalidate the use of proxy indicators in data scarce areas. Once identified, these indicators were used to establish an improved and cost-effective environmental monitoring and management programme (Corvalan and Kjellstrom, 1995, p.75). |

**Table 2.4: South- Sahara Africa: Household Income and Evaluate Public Investment Programs**

| South- Sahara Africa: Household Income and Evaluate Public Investment Programs (2008) | |
|---|---|
| **Proxy** | The authors used a number of proxies including foreign aid, inflation, agricultural land and dependency ratio to measure household income. |
| **Introduction** | Benin and Randriamamonjy (2008) commence the study with the argument that increasing rural household income is a central objective of most strategies designed to reduce poverty, hunger, and food and nutrition insecurity. To track and evaluate the progress of development projects and programs, up-to-date information on the local level is vital. Although the information is of such an important nature, accurate indicators on a local level are costly and time consuming to obtain (Benin & Randriamamonjy, 2008). |

| | |
|---|---|
| **The need for proxy indicators** | The authors argue that this knowledge gap is frustrating government and donor agencies that spend large sums capital on development projects and programs and yet they cannot accurately measure the outcome of the projects on a local level. Given the cost and time constraints countries face in attempting to provide a consistent output of up-to-date information on local level, developing cheaper and less time consuming methods for providing the information is essential. The study proposes proxy indicators as a cheaper and less time-consuming approach (Benin & Randriamamonjy, 2008). |
| **Methodology** | To identify the proxy indicators, the authors used literature on economy-wide models to determine how the various sectors of the economy interact with each other. Benin and Randriamamonjy (2008) accept that although the model is not appropriate for making conclusions regarding any cause–effect relationships, but it is still important to have proxy indicator variables that have strong logical and empirical links to household income. Although several potential variables can be used as proxy indicators, the study focused on a core set of indicators that accurately measure household income (Benin & Randriamamonjy, 2008). After accurate indicators were selected, the study used the set of indicators to develop a model used to determine the household income. |
| **Conclusion** | The study used proxy indicators as a time and cost-effective alternative to provide information on a local level in a data scarce area. |

**Table 2.5: USA: Regional Economic Development Indicators for a Knowledge-Based Economy**

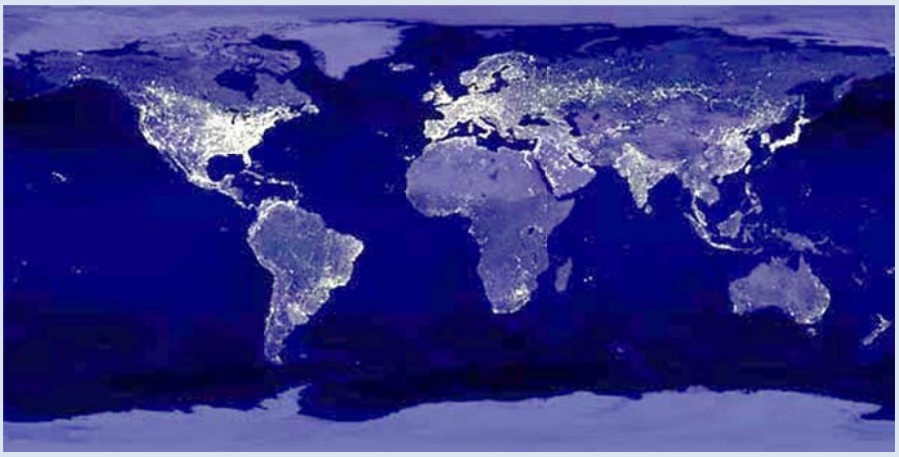
| USA: Regional Economic Development Indicators for a Knowledge-Based Economy (2008) | |
|---|---|
| **Proxy** | A range of proxy indicators including cultural enablers, infrastructure, art, quality of life and financial capital was used to predict regional economics. |
| **Introduction** | In the study a regional economic indicator framework was created to address the change necessary for economic regions moving from a manufacturing-based to a knowledge-based economy in the US (Russ & Jones, 2008). The original goals of the project were to provide a clear and specific set of regional economic development outcome indicators and inform and train business leaders of the regional economic development initiative to use these newly developed indicators; and share the learning in this region (Russ & Jones, 2008) |
| **The need for proxy indicators** | The project was proposed to address the needs of a knowledge deficient region. The project team decided to make use of proxy indicators as indirect measures because developing a full set of local measures for such a complex phenomenon could take years (Russ & Jones, 2008). |

| | |
|---|---|
| **Methodology** | The authors could not identify, in the academic literature, a guideline for developing a selection criterion for regional indicators (Russ & Jones, 2008). In the commencement of the indicator development, the intent was to propose an initial set of indicators that, if adopted, would provide the basis for future modelling. Consultations with leaders of the regional were held to identify indicators that they believe reflect the unique aspects of their sub-region within the regional context (Russ & Jones, 2008). |
| **Conclusion** | The project team were able to successfully develop a set of proxy indicators in the given time and cost framework that could accurately measure the changes in the regional economy. |

**Table 2.6: Canada: The Productivity Paradox**

| Canada: The Productivity Paradox (1999) | |
|---|---|
| **Proxy** | Labour, capital and material inputs as a proxy indicator for the productivity in the service sector. |
| **Introduction** | The author argues that difficulties in measuring the output of service sectors as well as creating a reliable index of productivity in service industries have been well documented in many studies (Wolff, 1999). The challenge is how to measure productivity in an industry in which output is difficult to measure but inputs are relatively easily measured (Wolff, 1999). |
| **The need for proxy indicators** | According to the study most approaches only capture one aspect of the industry output and often the least important part (Wolff, 1999), thus an alternative approach was needed. |
| **Methodology** | The author used an alternative approach and employed several indirect indicators of productivity growth in the service sector. The indicators relate to the growth rate of productivity rather to its level and that the indices developed provide circumstantial evidence rather than direct evidence on productivity movements (Wolff, 1999). |
| **Conclusion** | In conclusion it was possible for the author to develop a set of proxy indicators to measure the output of service sectors. |

**Table 2.7: International: Using luminosity data as a proxy for economic statistics**

| Using luminosity data as a proxy for economic statistics (2011) | |
|---|---|
| **Proxy** | The study used luminosity (measurement of brightness) as a proxy indicator of economic statistics. The following picture illustrates the use of luminosity to measure economic activity. The primary principle is that light/brightness represents economic activity.<br>  <br>(NASA, 2012) |
| **Introduction** | Chen and William (2011) argue that a persistent issue in social research has been how to improve the quality of socioeconomic data in developing countries. Given the shortcomings of standard sources of data, the author investigates the use of luminosity (measures of night-time lights visible from space) as a proxy indicator for gross domestic product (Chen & William, 2011). |
| **The need for proxy indicators** | The aim of the study was to determine whether luminosity contains useful information for constructing economic data at either the national or the sub national level (Chen & William, 2011). The authors hoped to add value in countries with poor conventional data and those with few or no data at a sub national scale (Chen & William, 2011). |
| **Conclusion** | The study found that luminosity has informational value as a proxy for countries with low-quality statistical systems, particularly for those countries with no recent population or economic censuses (Chen & William, 2011). The proxy has very limited value added for countries with high quality up-to-date data but can be a useful supplement to current economic indicators in countries and regions with very poor quality or missing data (Chen & William, 2011). |

**What is learnt from the studies:** The first finding is that there is not a theoretical basis in academic literature for the development, use and selection criteria for proxy indicators. We do however learn that proxy indicators have the power be used as a cost and time effective alternative for more conventional data gathering applications and that there is merit in exploring the topic further. Proxy indicators have very limited value for areas with high quality up-to-date data but have the ability be a useful supplement to current economic indicators in areas with very poor quality data.

**…and what not:** There have not been a study that analysed the use of a wide range of indicators for the use in economic data gathering that the author are aware of. There is thus uncertainty about what indicators could be accurate, and which not as there have yet been an academic study of this nature. There is no scale indication that demonstrates where indicators can work, and none of the results have been compared to conventional methods to identify the level of accuracy and correlation with using proxy indicators.

**Influence of the studies on the dissertation and thought process:** As there is not a theoretical basis in academic literature for development of a set of indicators as aimed in this study, it is clear that there is an opportunity to perform an exploratory study into the use of proxy indicators on the scale proposed by the author. The fact that proxy indicators have effectively been used in these practical applications indicates there is merit in exploring the topic further. Very little research has been done in a context similar to the study and exploring the subject can provide a basis for further studies.

## 6. Traits emerging from literature reviews

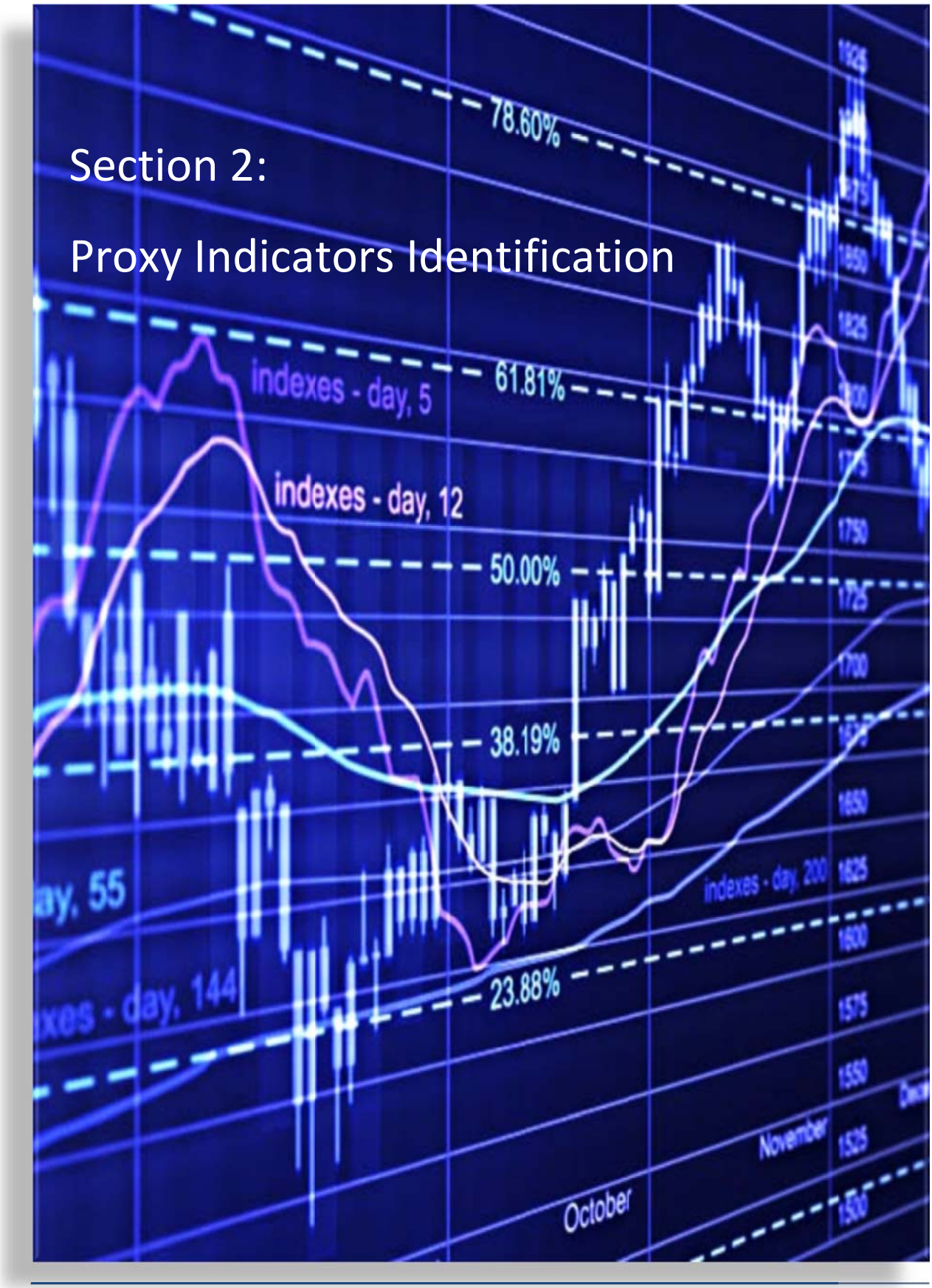
Valuable traits have been identified regarding the use and selection of proxy indicators:

- Proxy indicators have the ability to provide valuable insight in **data scarce areas,** especially at a local level (Provincial Government of the Western Cape, 2009:2; Songsore, *et al*, 1998; Benin & Randriamamonjy, 2008).
- Consumer behaviour changes with economic cycles (Todd, 2008; Clifford, 1985; Bohlen, 2009) and **consumer behaviour** can accordingly provide valuable insight into the economy.
- There are a variety of socio-economic statistics can be used as proxy measures to predict future economic conditions (UNDP, 2002).

- Proxy indicators possess the power be used in order to **provide an immediate indication** of the attribute while theory driven indicators is put in place (Rabie, 2011).
- A common commencement to identify proxy indicators is literature on **economy-wide models** and how various sectors of the economy interact with each other (Benin & Randriamamonjy, 2008).
- Proxy indicators should be **accurate, timely, and reliable** (US Aid, 1998; Provincial Government of the Western Cape, 2009:2).
- Proxy indicators can provide a very **cost-effective alternative** method of collecting data (Provincial Government of the Western Cape, 2009:2; Songsore, *et al*, 1998; Corvalan & Kjellstrom, 1995).
- It is important to **consult** with leaders and experts of the region to determine if the indicators reflect the unique aspects of their region (Russ & Jones, 2008; *Songsore et al, 1998)*.
- Proxy indicators have the ability to provide a **less time-consuming** alternative measure of attributes (Benin & Randriamamonjy, 2008).
- It is important to have a proxy indicator that has a **strong logical and empirical links** to the attribute (Benin & Randriamamonjy, 2008; Russ & Jones, 2008).
- Although several potential variables can be used as proxy indicators, it important to use a **smaller number of accurate proxy indicators** (Benin & Randriamamonjy, 2008).
- A proxy indicator relates to the **growth/decline** of an attribute rather than to the level of the attribute (Wolff, 1999).
- Proxy indicators can improve the quality of socioeconomic data in **developing countries** with low-quality statistical systems (Chen & William, 2011).

## 7. Conclusion

The literature consulted makes a strong case for suggesting that there is merit in exploring the use of proxy indicators in measuring the economy. Proxy indicators have the ability to provide data in areas where confessional methods are not possible in the time and cost parameters. The fact that proxy indicators have effectively been used in a number of practical applications indicates there is merit in exploring the topic further. No evidence of research was found in which the phenomenon was studied to the extent that the author does in this dissertation.




# Section 2:

# Proxy Indicators Identification

# Chapter 1: Methodology

## 1. Introduction

***A wise man can learn more from a foolish question***

***than a fool can learn from a wise answer.***

***-- Bruce Lee (1996)***

The following chapter provides an overview of the methodology that was used in conducting the research of section two (the first question) in the dissertation. The goal of this section is to determine (using desktop research) what economic indicators effectively display economic circumstances. These results are then be used in imperial study in section three of the dissertation.

## 2. Overview

The following section of the study primarily makes use of secondary data obtained from a range of data sources, companies and individuals in order to test a large number of proxy indicators spread across a variety of economic sectors. Secondary data is data that is derived from the primary data instead of the truth itself (Leady & Ormrod, 2005; 89), and thus makes use of a range of existing data sources. As the scope of this section of the study demands a large volume of numerical data, the study can be described as 'quantitative'. One of the most important strengths of the quantitative method is that it is possible to generalise the results to a broad population (Bui, 2009:13).

For the scope of this study an exceptionally wide range of proxy indicators are tested and proxies range from the number of civil cases for debt to the profitability in the food, beverages and footwear sector. The intent is to identify indicators that are easily accessible and available in a variety of geographic areas and scales in order to increase the applicability and future use of the study. The proxy indicators that are tested in the first section of the study are categorised as property-related (Chapter 2), banking-related (Chapter 3), retail-related (Chapter 4) or additional proxy indicators (Chapter 5).

## 3. Approach

***In times of universal deceit, telling the truth will be a revolutionary act.***

***-- George Orwell (1948)***

The relationship between variables in statistics can be calculated using any modelling technique and is generally referred to as a regression analysis (Freedman, 2005). In order to analyse the above-mentioned relationship, the cycle (growth and decline) of each proxy indicator is compared to the cycle of the economy by using the time-series analysis technique. Using the results of the time-series analysis the researcher is able to categorise the proxy indicators according to their relationship with the economy (pro-cyclic, counter-cyclic or acyclic), as well as their timing with regards to economic fluctuations (leading, lagging or coincident). The accuracy of the relationship can further be categorised by means of the correlation analysis technique.

As a result of the inferential quality (Brown & Saunders, 2008) of the proxy indicators, these indicators can be used to accurately indicate the activity and behaviour of the economy. These proxy indicators can firstly indicate the current state of the economy and secondly predict future behaviour and trends.

Therefore, when the character of the relationship is established between the proxy indicators and the economy, predictions of the economy can be made based on the relationship between the economy and the indicators (Treiman, 2009:89). One of the key advantages is that these proxy indicators can indicate tends in a very cost-effective manner. Thus a proxy model can be used in circumstances where there are (1) financial constraints, (2) time constraints, and (3) as pre-studies before more costly and time consuming economic studies.

The secondary data used in this section is derived from the Quantec database. Where possible the data ranges lies between the first quarter of 2005 and the last quarter of 2010. Although there are limitations to the use of this dataset as described in section one in chapter one, the researcher is of the opinion that the database is currently the most accurate data available. It should however be noted that the data used in this section is only used for the identification of the indicators tested in section three of this dissertation.

## 4. Proxy Indicators

Table 1.1 below provides a list the proxy indicators that are tested in the dissertation according to the categories identified above.

**Table 1.1: Proxy Indicators**

| Nr | Key Proxy Indicator | Sub Proxy Indicator Categories |
|---|---|---|
| **Property (Chapter 2)** | | |
| 1 | Number of Residential properties sold | Affordable Housing |
| | | Middle Class Housing |
| | | High-end Housing |
| 2 | Growth in Building activity | Residential |
| | | Non-residential |
| 3 | Submission of Building Plans | Residential |
| | | Non-residential |
| | | Additions |
| **Retail (Chapter 3)** | | |
| 4 | Retail Sales | Semi-Durable |
| | | Durable |
| | | Non-Durable |
| 5 | Business Profit | Semi-Durable |
| | | Durable |
| | | Non-Durable |
| 6 | Non-Consumer Goods | Volume of Sales |
| | | Profitability |
| 7 | Consumer Goods | Volume of Sales |
| | | Profitability |
| 8 | Hardware Retailers | Volume of Sales |
| | | Profitability |
| 9 | Building Materials | Volume of Sales |
| | | Profitability |
| 10 | Textiles, clothing and footwear | Volume of Sales |

| Nr | Key Proxy Indicator | Sub Proxy Indicator Categories |
|---|---|---|
| | | Profitability |
| 11 | Food and Beverages | Volume of Sales |
| | | Profitability |
| 12 | Vehicles | New Vehicles |
| | | Used Vehicles |
| | | Spare Parts |
| **Banking (Chapter 4)** | | |
| 13 | House bonds | |
| 14 | Bank deposits | |
| 15 | Savings | Short-term |
| | | Long-term |
| 16 | Banking Income | |
| 17 | Business Confidence | |
| **Additional (Chapter5)** | | |
| 18 | Fuel Consumption | |
| 19 | Electricity use | |
| 20 | Civil Cases | |
| 21 | Reported Crime | |

## 5. Data-Analysis

The data in section two is collected in numerical format, and in order to compare the data more accurately (Bui, 2009), the data is expressed as a percentage growth or decline over time at constant prices. The aim was to collect the data ranging from the first quarter of 2005 to the fourth quarter of 2010. But as the availability data for each indicator differed greatly, sample sizes in some instances differed.

The economy referred to in the first section is expressed in terms of the Gross Domestic Product, which refers to the market value of all final goods and services produced in a country in a given period. GDP and/or GDP growth is the most widely used indicator of the economy in modern economics (Olivier, 2003).

The analysis of the proxy indicators is based on both time-series analysis and correlation analysis. Time-series analysis involves plotting data trends over a specific time, for a specific geographic area for a specific unit of analysis (Cortright and Reamer, 1998). To simplify the analysis, the time-series data is expressed in percentages and illustrated graphically. Each proxy indicator is tested against the total national GDP production at constant prices over a five year cycle (between 2005 and 2010). The graph indicating the cycle of the proxy indicator was then compared to the cycle of the economy by means of time-series analysis. The proxy indicators were then categorised according to their relationship with the economy.

The accuracy of the relationship between the proxy indicator and the economy was calculated in order to grade the proxy indicators in terms of their relationship with the economy by means of a correlation coefficient analysis. Correlation refers to the statistical relationships involving dependence between variables and is expressed in terms of a correlation coefficient (r). A correlation coefficient is an indication of how strong a linear relationship exists between two numeric variables x and y. The results of the correlation coefficient carry the following attributes:

- The correlation coefficient is always a number between -1.0 and +1.0.
- The closer the correlation coefficient is to +1.0, the stronger the positive linear relationship between x and y (if x increases, y increases).
- The closer the correlation coefficient is to -1.0, the stronger the negative linear relationship between x and y (if x increases, y will decrease).
- The closer to zero the correlation coefficient is the less of a linear relationship between x and y exists.
- Correlations above 0.80 are generally considered as high and suitable for economic modelling and forecasting (Ezekiel & Fox, 1959; Oosterhof, 1999).

The correlation analysis used for this dissertation takes into account that some of the data sets can have a non-linear correlation (in terms of a leading or lagging indicator). The correlation analysis accordingly accommodates the timing of the proxy indicator with regards to the economy.

A key aspect to take into account when working with correlations is not to assume a correlation means that a change in one variable causes a change in another. For example, if the sales of ice cream and

motorcycles have both risen strongly in a set period of time indicating a high correlation, it cannot be assumed that a rise in the sales of ice cream will necessarily bring about a rise in the sales of motorcycles (or vice versa). However, for the purpose of this study, the cause for the change in the variables is not important; only the change (was or was there not a change).

## 6. Conclusion

The chapter provided an overview of the methodology that are used in conducting the research of section two (the first question) in the dissertation. The goal of this section (two) is to identify economic indicators that effectively display economic circumstances. The analysis of the proxy indicators is based on time-series analysis and correlation analysis. An exceptionally wide range of proxy indicators was tested and are categorised as property-related (Chapter 2), banking-related (Chapter 3), retail-related (Chapter 4) or additional proxy indicators (Chapter 5).

# Chapter 2: Property-Related Proxy Indicators

## 1. Introduction

In this chapter, a number of property-related proxy indicators are compared to economic cycles in order to understand the relationship between the proxy indicator and the economy. According to Leamer (2007) the residential property market offers by far the best early warning sign of an oncoming recession and can be deemed as one of the most accurate indicators of economic cycles.

Table 2.1 below illustrates the property-related proxy indicators that are discussed in the following chapter.

**Table 2.1: Property-Related Proxy Indicators**

| Nr | Proxy Indicator | Description | Subcategories | Source |
|---|---|---|---|---|
| 1 | Number of Residential properties sold | The number of residential properties/units sold per quarter in South Africa compared to the economic conjecture. | Affordable Housing<br>Middle Class Housing<br>Luxury Housing | ABSA House Price Index |
| 2 | Growth in Building activity | The growth or decline of recorded building activity in South Africa compared to the economic conjecture | Residential<br>Non-residential | BER: Building and Construction Survey |
| 3 | Submission of Building Plans | The number of building plans submitted to local authorities in South Africa compared to the economic conjecture. | Residential<br>Non-residential<br>Additions | Quantec Databases |

## 2. The Residential Property Market

The importance of the housing market to macroeconomics and financial markets has attracted the attention of macroeconomic and financial researchers in recent years (Chang, 2010). Despite the fact that the relationship between the housing market and the economy differs from country to country as a result of institutional frameworks, tenure structures and mortgages (Meen, 2011), the housing market in general remains one of the best predictive indicators of the economic cycle (Leamer, 2007). The major

advantages of the housing market compared to other indicators include that house prices are much more volatile than goods prices (Holly & Jones, 1997) and that house prices are inflexible descending, thus when demand softens the market sustains a very little price adjustment but a significant volume drop (Leamer, 2007).

The following subsection analyses the relationship between the number of residential units sold in South Africa and the economy between 2005 and 2010. The subjection is divided according to the size of the property, based on the ABSA House Price Index:

| Proxy Indicator | Size | Size $m^2$ |
|---|---|---|
| Affordable Housing | Small | 80m²-140m² |
| Middle Class Housing | Medium | 141m²-220m² |
| Luxury Housing | Large | 221m²-400m² |

***ABSA House Price Index (2011)***

## 2.1. Affordable Housing

Figure 2.1 below indicates the number of affordable houses sold in South Africa between 2005 and 2010 and the national GDP.

**Figure 2.1: Affordable Housing**


***ABSA House Price Index: 2005-2011***

Figure 2.1 indicates a pro-cyclic relationship between the number of affordable houses sold and the economy, the proxy is leading the economy. The correlation of the relationship between the indicators and the economy is 0.66.

## 2.2. Middle Class Housing

Figure 2.2 below indicates the number of middle class houses sold in South Africa between 2005 and 2010 and the national GDP.

**Figure 2.2: Middle Class Housing**

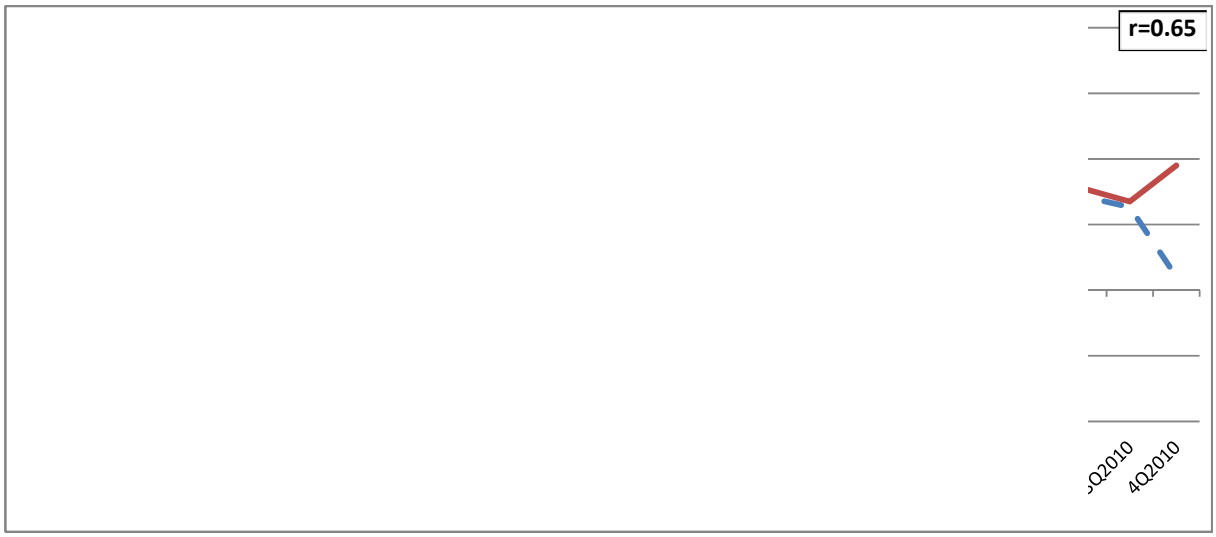

***ABSA House Price Index: 2005-2011***

As shown in Figure 2.2 the number of middle class houses sold illustrates similar behaviour as the economy, with a leading tendency of approximately three to four quarters. The correlation between the variables is 0.81.

## 2.3. Luxury Houses

Figure 2.3 below indicates the number of luxury houses sold in South Africa between 2005 and 2010, compared to the national GDP.

**Figure 2.3: Luxury Housing**




***ABSA House Price Index: 2005-2011***

Figure 2.3 indicates the relationship between the number of luxury houses sold and the economy. The relationship is pro-cyclic with a leading timing. The correlation between the proxy indicator and the economy is 0.65.

## 2.4. Deduction

Figure 2.4 below indicates the number of luxury, affordable and middle class houses sold in South Africa between 2005 and 2010 and the national GDP.

Middle class housing is the most accurate proxy indicator for the economy in terms of the number of houses sold. It is a leading indicator of approximately one or two annual quarters, with similarities in the magnitude of fluctuations.

**Figure 2.4: Number of Housing Sales**


***ABSA House Price Index: 2005-2011***

## 3. Building Activity

Building/Construction activities are considered to be one of the major sources of economic growth, development and economic activities (Khan, 2008). As construction in any country is a complex sector of the economy (Hillebrandt, 1985), and has strong linkage with many economic activities (Bon *et al*., 1999; Lean, 2001), whatever happens to the construction industry will directly and indirectly influence the entire economy.

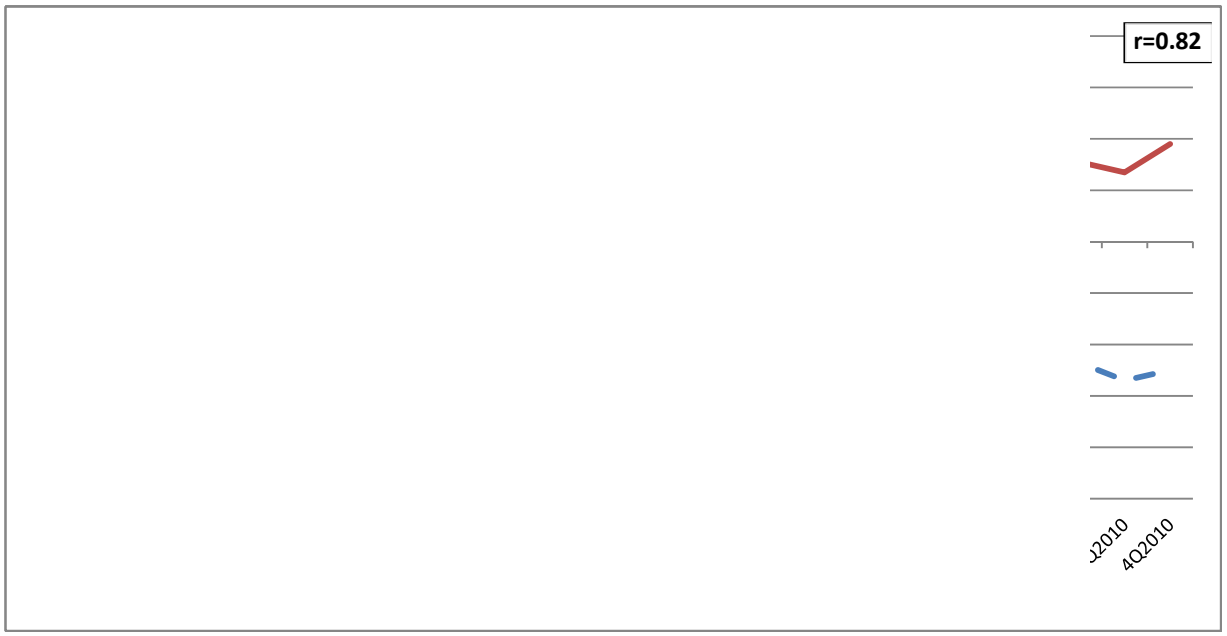
On the basis of a cross-section of data from a large number of countries at various levels of development, Turin (1969) as well as Yiu *et al* (2004) argued that there is a positive relationship between construction output and economic growth. Studies have shown that the interdependence between the construction sector and other economic sectors is not static but changes as the nation's economy grows and develops (Bon, 1992).

The following subsection illustrates the growth in building activities in both residential and non-residential building activities.

## 3.1. Growth in Residential Building Activity

Figure 2.5 below illustrates the growth in building activity for residential units in South Africa from 2005 to 2010 and the national GDP.

**Figure 2.5: Growth in Residential Building Activity**




***BER: Building and Construction Survey, 2005-2011***

There is a strong correlation of 0.82 between the growth in building activity and the economy. The average growth in building activity is lower than the average growth in the economy, but the relationship remains consistent.

## 3.2. Growth in Non-Residential Building Activity

Figure 2.6 below illustrates the growth in non-residential building activity in South Africa from 2005 to 2010 and the national GDP.

**Figure 2.6: Growth in Non-Residential Building Activity**


***BER: Building and Construction Survey, 2005-2011***

There is a positive correlation between non-residential building activities and the economy. The relationship is pro-cyclic and to some extent a leading timing. The value of the correlation is 0.80.

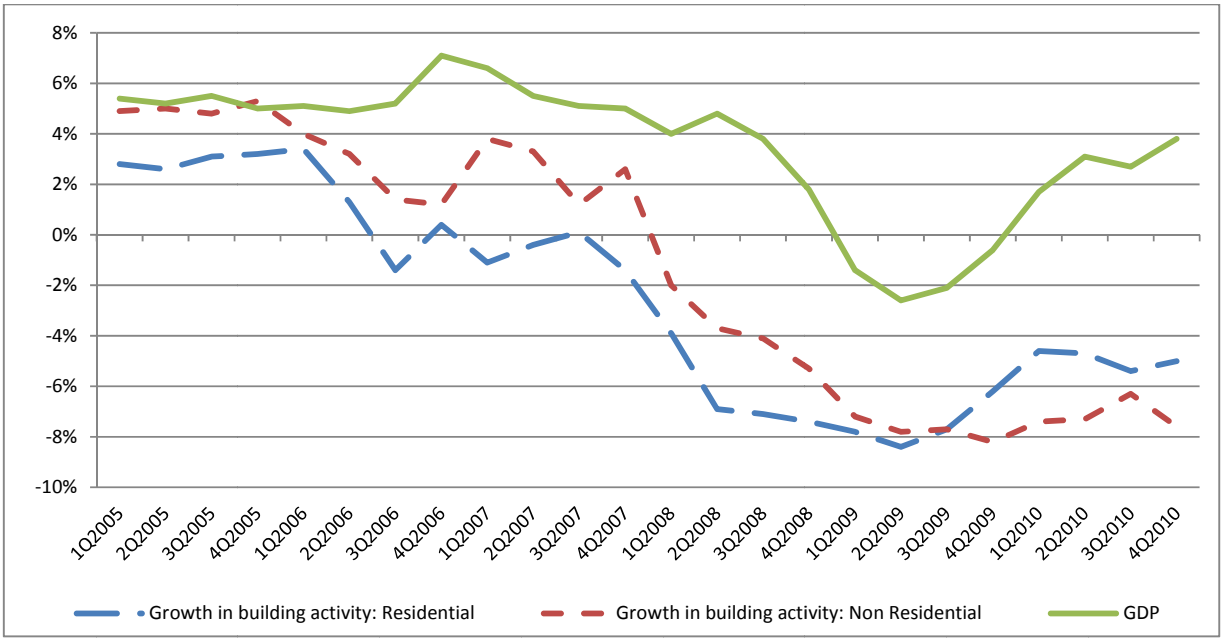
## 3.3. Deduction

Figure 2.7 below indicates the growth in the number of non-residential as well as residential units sold in South Africa between 2005 and 2010 and the national GDP.

There is a positive correlation between both non-residential and residential building activity and the economy. The relationship is pro-cyclic and to some extent a leading indicator. The growth in residential building activities has a slightly closer relationship with the economy than non-residential building activities with a strong correlation of 0.82.

The growth in building activity is lower for both non-residential and residential building activity than the average growth in the economy, but the relationship remains consistent. The value of the non-residential correlation is 0.80.

**Figure 2.7: Growth in Building Activity: Residential vs. Non-Residential**




***BER: Building and Construction Survey, 2005-2011***

## 4. Building Plans

In its nature the approval of building plans are directly correlated to the growth/stagnation in building activity, as the approval of building plans are necessary for legal construction activity (excluding plans approved which the commencement of the construction is delayed).

A notable increase in the number of residential building plans passed, particularly for flats and townhouses, was one of the largest contributors to the recovery of the South African economy after the global financial downturn, and one of the most accurate leading economic indicators (Maswanganyi, 2011).

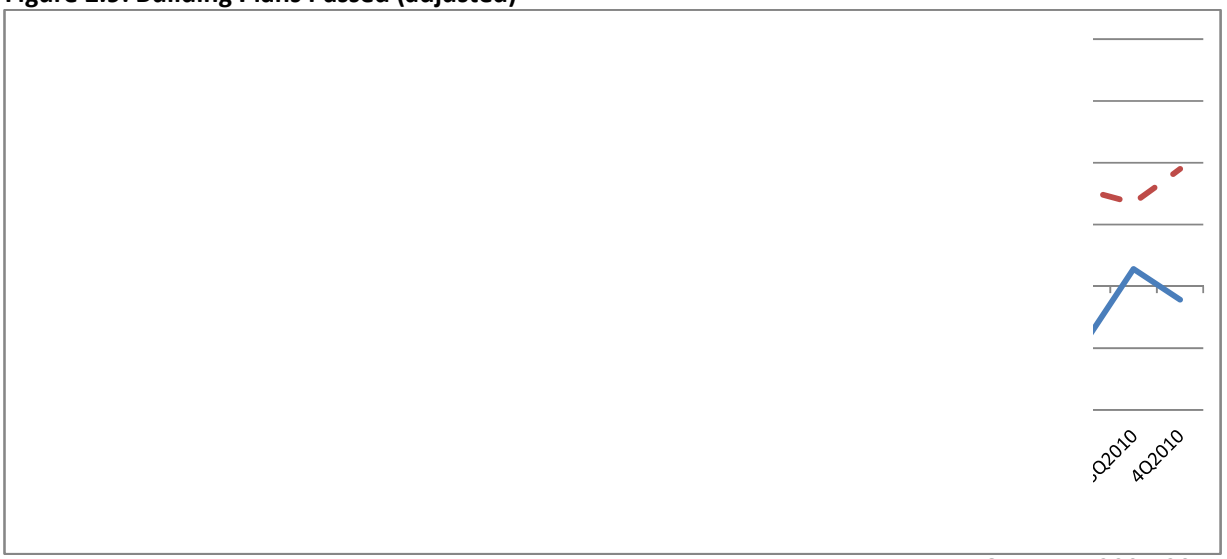
Figure 2.8 below illustrates the growth/decline in the number of building plans passed and the national GDP.

**Figure 2.8: Building plans passed**


***Quantec: 2005-2011***

The figure represents the actual relationship between the economy and the number of building plans passed, but on the scale presented the relationship is difficult to analyse using time-series analysis technique. Figure 2.8 illustrates the same information as in Figure 2.9, but the growth in building activity is illustrated as a factor of 0.1. (*The correlation between data sets is not influenced by expressing the data as a factor of x, as correlation measures the relationship of the variables and not the extent of the change.)*

**Figure 2.9: Building Plans Passed (adjusted)**




***Quantec: 2005-2011***

The data reveals a pro-cyclic relationship between the number of building plans passed and the economy. However as can be seen in Figure 2.9, the number of building plans approved is much more volatile than the growth in building activity. The number of building plans submitted can therefore be especially useful to indicate small changes in the economy as a small change in the economy have a major change in the number of building plans passed.

## 4.1. Building Plans: Non-Residential

Figure 2.10 below illustrates the growth/decline in the number of building plans passed and the national GDP in terms of the type of building application approved.

**Figure 2.10: Non-Residential Building Plans Passed**

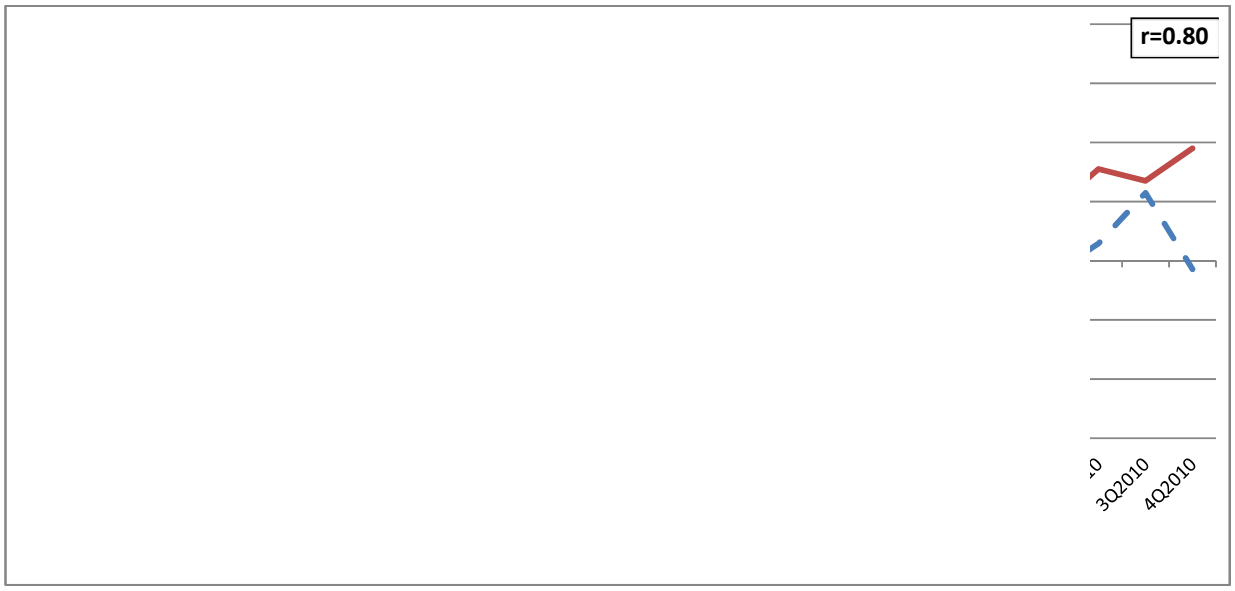
***Quantec: 2005-2011***

Figure 2.10 indicate a relationship between the number of non-residential building plans passed and the economy, although the relationship is not deemed accurate enough for use as a proxy indicator and measured at a correlation of 0.54.

## 4.2. Building Plans: Residential

Figure 2.11 below illustrates the growth/decline in the number of residential building plans passed and the national GDP.

**Figure 2.11: Residential Building Plans Passed**




***Quantec: 2005-2011***

Figure 2.11 illustrates that the relationship between the number of residential building plans passed and the economy is pro-cyclic, measured at a correlation of 0.80.

## 4.3. Building Plans: Additions

Figure 2.12 below illustrates the growth/decline in the number of building plans passed in terms of additions and the national GDP.

The data reveals a relationship between the number of addition plans passed and the economy, although the correlation is only measured at 0.59.

**Figure 2.12: Building Addition Plans Passed**


***Quantec: 2005-2011***

## 4.4. Deduction

Figure 2.13 below illustrates the growth/decline in the number of building plans passed and the national GDP in terms of the type of building application approved.

**Figure 2.13: Building Plans Passed, Type**


***Quantec: 2005-2011***

Figure 2.13 indicates that the number of residential building plans passed portrays the behaviour of the economy best. The number of non-residential building plans and building additions follow the same behaviour, but the correlation between residential building plans and the economy is the most paramount.

## 5. Conclusion

In this chapter a number of property-related proxy indicators were compared to economic cycles in order to understand the relationship between the proxy indicator and the economy. The key findings related to the proxy indicators are discussed in Table 2.2 below.

**Table 2.2: Property-Related Proxy Indicators: Key Findings**

| Nr | Proxy Indicator | Subcategories | Correlation | Key Findings |
|---|---|---|---|---|
| 1 | Number of Residential properties sold | Affordable Housing | 0.66 | Middle class housing (141m²-220m²) is the most accurate proxy indicator compared to the high and the low end of the market. It is a leading indicator and accurately mirrors the economy except for a major change in the second quarter of 2009 to the second quarter of 2010. |
| | | Middle Class Housing | 0.81 | |
| | | Luxury Housing | 0.65 | |
| 2 | Growth in Building activity | Residential | 0.82 | The relationship identified in the BER data suggests a pro-cyclic and leading relationship between activity in the construction sector and the economy as argued by Turin (1969). |
| | | Non-residential | 0.80 | |
| 3 | Submission of Building Plans | Residential | 0.80 | The data reveals a pro-cyclic relationship between the number of building plans passed and the economy. The number of residential building plans passed portrays the behaviour of the economy the most accurate (compared to non-residential building plans and building additions). |
| | | Non-residential | 0.54 | |
| | | Additions | 0.59 | |

# Chapter 3: Retail-Related Proxy Indicators

## 1. Introduction

In the following chapter a number of retail-related proxy indicators are compared to the South African economy in order to understand the relationship between the proxy indicator and the economy. Table 3.1 below illustrates the retail-related proxy indicators that are discussed in the following chapter.

**Table 3.1: Retail-Related Proxy Indicators**

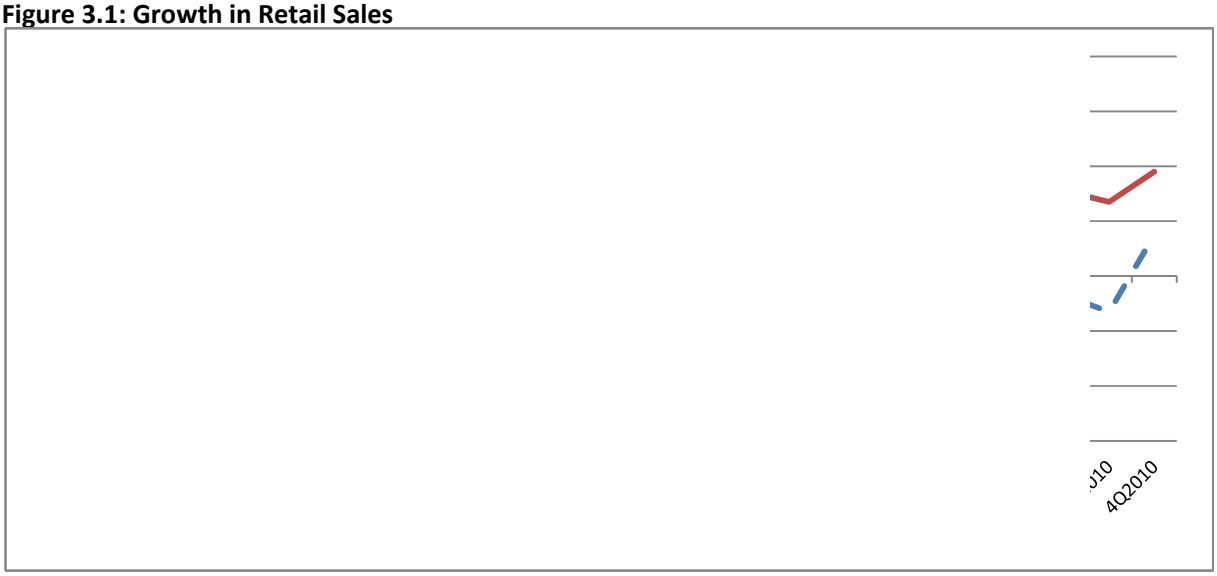
| Nr | Proxy Indicator | Description | Subcategories | Source |
|---|---|---|---|---|
| 4 | Retail Sales | Total growth and decline in sales of the retail sector in South Africa. | Semi-Durable<br>Durable<br>Non-Durable | BER: Retail Survey (2005-2010) |
| 5 | Business Profit | Total growth and decline of business profit in the retail sector in South Africa. | Semi-Durable<br>Durable<br>Non-Durable | BER: Retail Survey (2005-2010) |
| 6 | Non-Consumer Goods | Volume of sales and profitability of non-consumer goods in South Africa. | Volume of Sales<br>Profitability | BER: Retail Survey (2005-2010) |
| 7 | Consumer Goods | Volume of sales and profitability of consumer goods in South Africa. | Volume of Sales<br>Profitability | BER: Retail Survey (2005-2010) |
| 8 | Hardware Retailers | Volume of sales and profitability of hardware retailers in South Africa. | Volume of Sales<br>Profitability | BER: Retail Survey (2005-2010) |
| 9 | Building Materials | Volume of sales and profitability of building materials in South Africa. | Volume of Sales<br>Profitability | BER: Retail Survey (2005-2010) |
| 10 | Textiles, clothing and footwear | Volume of sales and profitability of textiles, clothing and footwear in South Africa. | Volume of Sales<br>Profitability | BER: Retail Survey (2005-2010) |
| 11 | Food and Beverages | Volume of sales and profitability of clothes, food and beverages in South Africa. | Volume of Sales<br>Profitability | BER: Retail Survey (2005-2010) |
| 12 | Vehicles | The number of new and used vehicles sold in South Africa including the sales of spare parts. | New Vehicles<br>Used Vehicles<br>Spare Parts | NAAMSA (2005-2010) |

## 2. Growth in Retail sales

The following subsection describes the relationship between the growth and decline in retail sales and the economy.

Figure 3.1 below illustrates the growth in the volume of total retail sales in South Africa in relation to the national economy.

**Figure 3.1: Growth in Retail Sales**




***BER: Retail Survey, 2005-2011***

Figure 3.1 illustrates that the volume of retail sales reflect the behaviour of the economy. The relationship can be defined as a pro-cyclic coincidental indicator. Retail sales are discussed as durable goods (goods serving their usefulness for a long period of time), semi-durable goods (goods that are neither perishable nor lasting) and non-durable goods (which are used or consumed for only a short span of time).

### 2.1. Growth in Semi-Durable Retail Sales

Figure 3.2 below illustrates the growth in the volume of sales for semi-durable retail goods in South Africa and the economy.

**Figure 3.2: Growth in Semi-Durable Retail Sales**

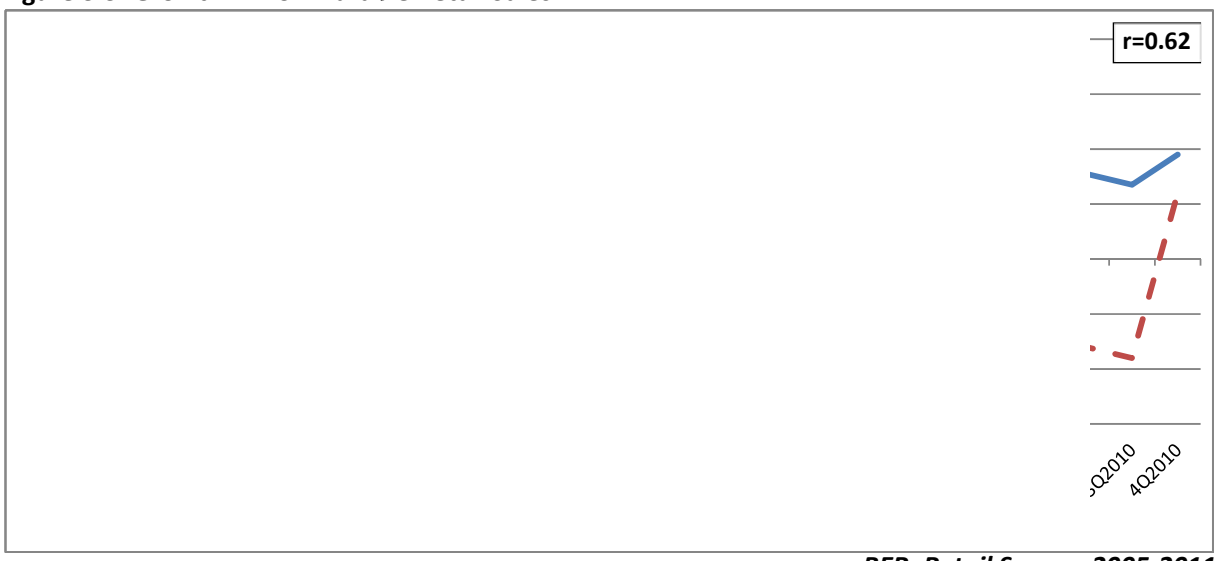

***BER: Retail Survey, 2005-2011***

The graph in Figure 3.2 indicates limited similarities exist between the economy and semi-durable retail goods, the indicator is consequently categorised as acyclic.

## 2.2. Growth in Non-Durable Retail Sales

Figure 3.3 below illustrates the growth in the volume of sales for non-durable retail goods in South Africa and the economy.

**Figure 3.3: Growth in Non-Durable Retail Sales**




***BER: Retail Survey, 2005-2011***

Figure 3.3 illustrates that the volume of sales of non-durable goods reflect the economy better than the semi-durable goods, measured with a correlation of 0.62.

## 2.3. Growth in Durable Retail Sales

Figure 3.4 below illustrates the growth in the volume of sales for durable retail goods in South Africa and the economy.

**Figure 3.4: Growth in Durable Retail Sales**


***BER: Retail Survey, 2005-2011***

As illustrated in Figure 3.4 the volume of sales of durable goods reflect the behaviour of the economy accurately, with a correlation of 0.95. The growths in the volume of durable retail sales are more sensitive in times of economic stagnations and recessions. The relationship is a pro-cyclic coincidental indicator.

## 2.4. Deduction

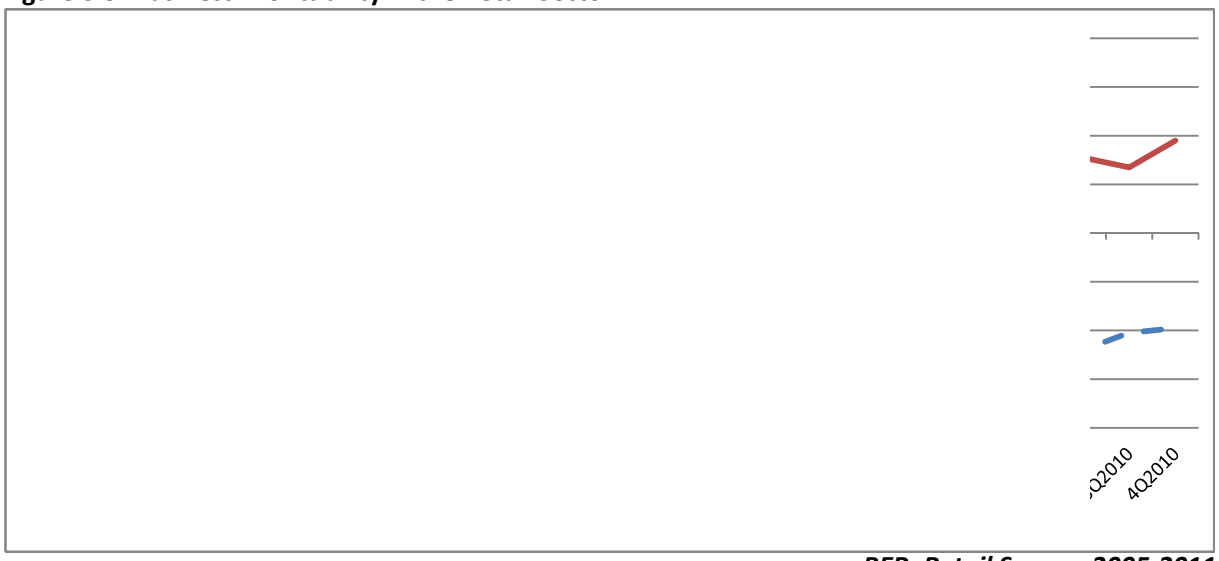
Although the total volume of general retail sales reflects the behaviour of the economy, the volume of sales of durable goods reflects the behaviour of the economy as a pro-cyclic and coincidental indicator with a correlation of 0.95.

## 3. Business Profit

The following subsection describes the relationship between the growth and decline in business profit in the retail sector and the economy.

Figure 3.5 below illustrates the growth in the profitability of the retail sector in South Africa in relation to the national economy.

**Figure 3.5: Business Profitability in the Retail Sector**



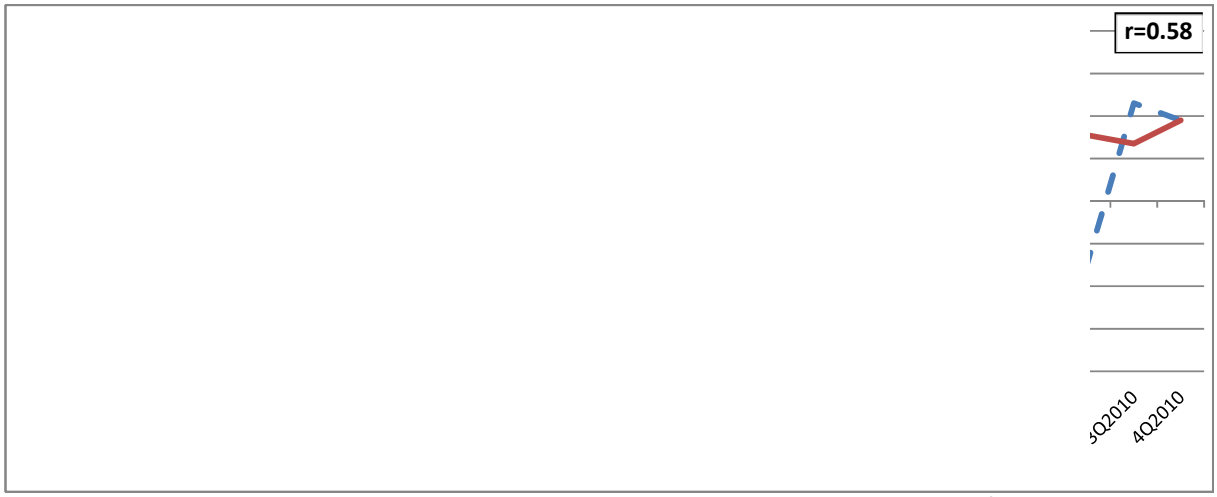

***BER: Retail Survey, 2005-2011***

Figure 3.5 points out that the profitability of the retail sector reflects the behaviour of the economy accurately and can be defined as a pro-cyclic coincidental indicator. As the retail sector is a broad and large sector, the business profit is further discussed as durable, semi-durable goods and non-durable goods.

### 3.1. Profitability in the Retail Sector: Semi-Durable Goods

Figure 3.6 below illustrates the growth in the profitability of the retail sector in terms of semi-durable goods in South Africa and the economy.

**Figure 3.6: Business Profitability in the Retail Sector: Semi-Durable Goods**




***BER: Retail Survey, 2005-2011***

Figure 3.6 indicates that although there is a long-term relationship between the profitability of the retail sector in terms of semi-durable goods and the South African economy, the correlation is not high enough to predict the behaviour of the economy on a short-term basis.

## 3.2. Profitability in the Retail Sector: Non-Durable Goods

Figure 3.7 below illustrates the growth in the profitability of the retail sector in terms of non-durable goods.

**Figure 3.7: Business Profitability in the Retail Sector: Non-Durable Goods**

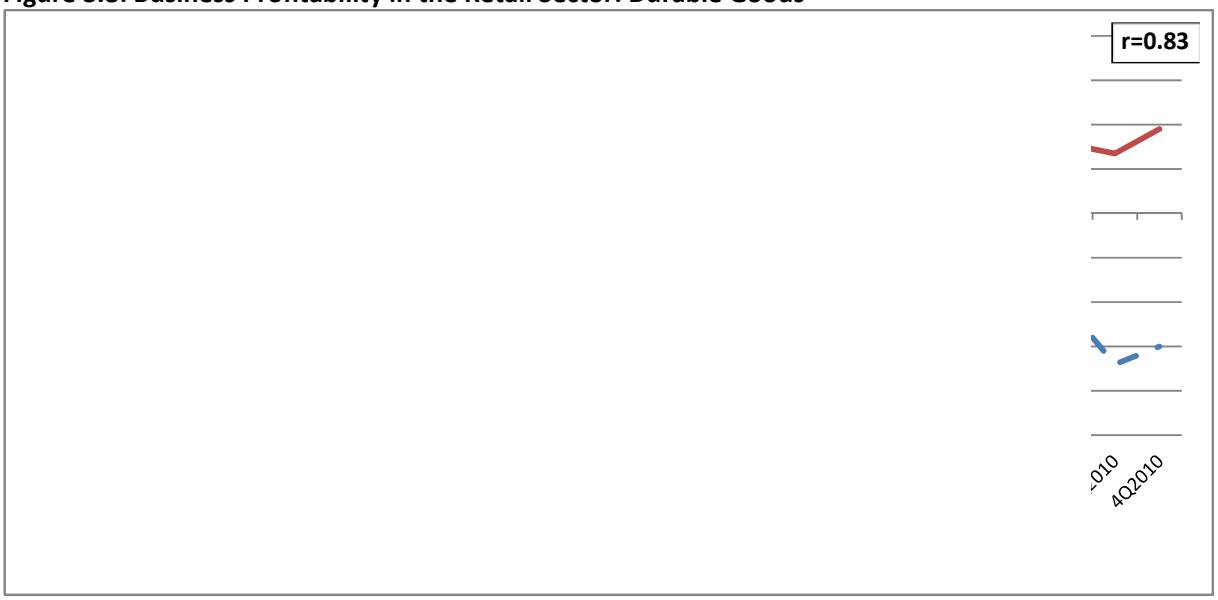

***BER: Retail Survey, 2005-2011***

Figure 3.7 illustrates that the profitability of the retail sector in terms of non-durable goods and the South African have a pro-cyclic relationship. The correlation is 0.79.

## 3.3. Profitability in the Retail Sector: Durable Goods

Figure 3.8 illustrates the growth in the profitability of the retail sector in terms of durable goods in South Africa and the economy.

**Figure 3.8: Business Profitability in the Retail Sector: Durable Goods**




***BER: Retail Survey, 2005-2011***

As illustrated in Figure 3.8 the profitability of the retail sector in terms of durable goods in South Africa reflect the behaviour of the economy. The relationship can accordingly be defined as a pro-cyclic coincidental indicator measured at a correlation of 0.83 and suggests an accurate indicator.

## 3.4. Deduction

Although the profitability of the retail sector in general reflects the behaviour of the economy in South Africa, the profitability of durable goods reflects the behaviour of the economy the most accurately as a pro-cyclic and coincidental indicator.

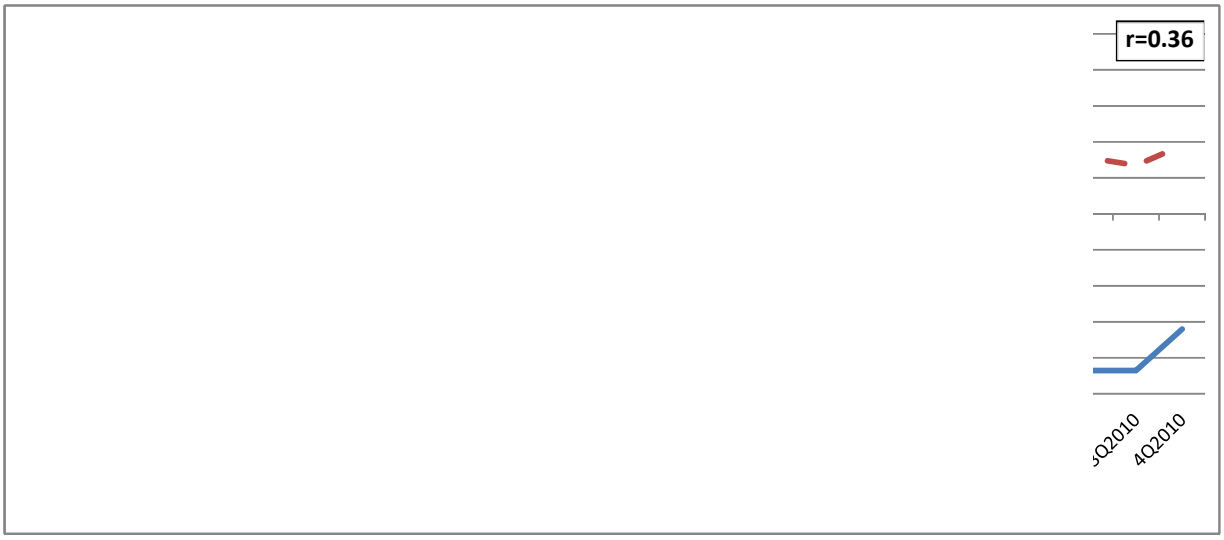
## 4. Non-Consumer Goods

Non-consumer goods are mainly used in production, including goods for agricultural production and construction materials.

### 4.1. Growth in Volume of Sales

Figure 3.9 below illustrates the growth in the volume of retail sales for non-consumer goods in South Africa and the economy.

**Figure 3.9: Growth in Retail Sales: Non-consumer goods**




***BER: Retail Survey, 2005-2011***

Figure 3.9 indicates that although some similarities exist between the economy and the volume of sales of non-consumer retail goods, the proxy is not an accurate representation and should be classified as acyclic. The correlation is measured at 0.36.

### 4.2. Profitability

Figure 3.10 below illustrates the profitability of retail sales for non-consumer goods in South Africa and the economy.

**Figure 3.10: Profitability: Non-consumer goods**


***BER: Retail Survey, 2005-2011***

Figure 3.10 illustrates that although some similarities exist between the economy and the profitability of the sales of non-consumer retail goods, the proxy is not an accurate representation and should be classified as acyclic. The correlation is measured at 0.28.

## 4.3. Deduction

The data indicates that neither the profitability nor the volume of retail sales in terms of non-consumer goods represent the economy to such an extent that it can be used as a proxy indicator.

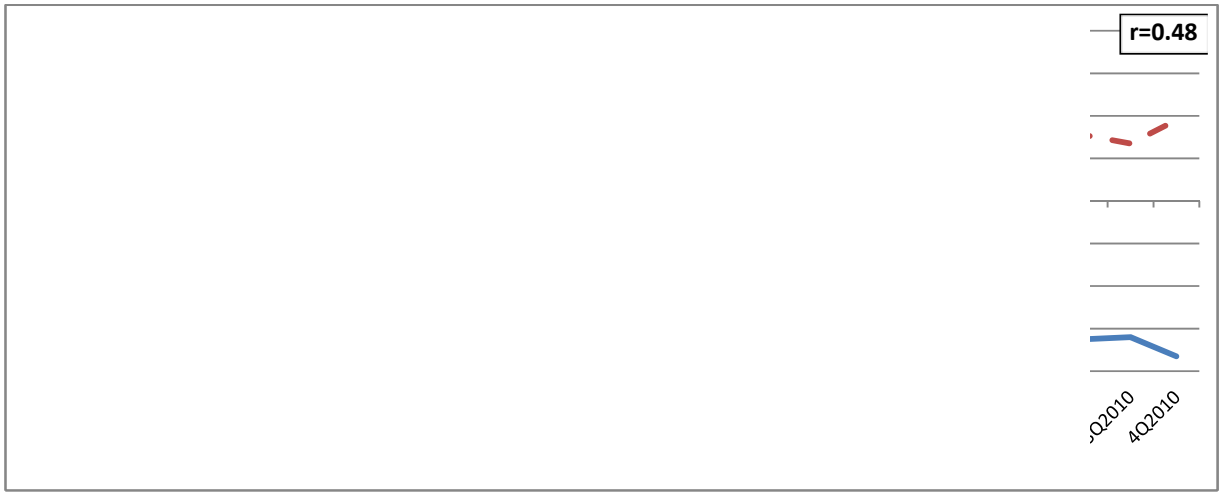
# 5. Consumer Goods

Consumer goods are any physical commodity purchased by a household or individual to satisfy their wants and needs and may be durable or nondurable.

## 5.1. Growth in Volume of Sales

Figure 3.11 below demonstrates the growth in the volume of retail sales for consumer goods in South Africa and the economy.

**Figure 3.11: Growth in Retail Sales: Consumer goods**



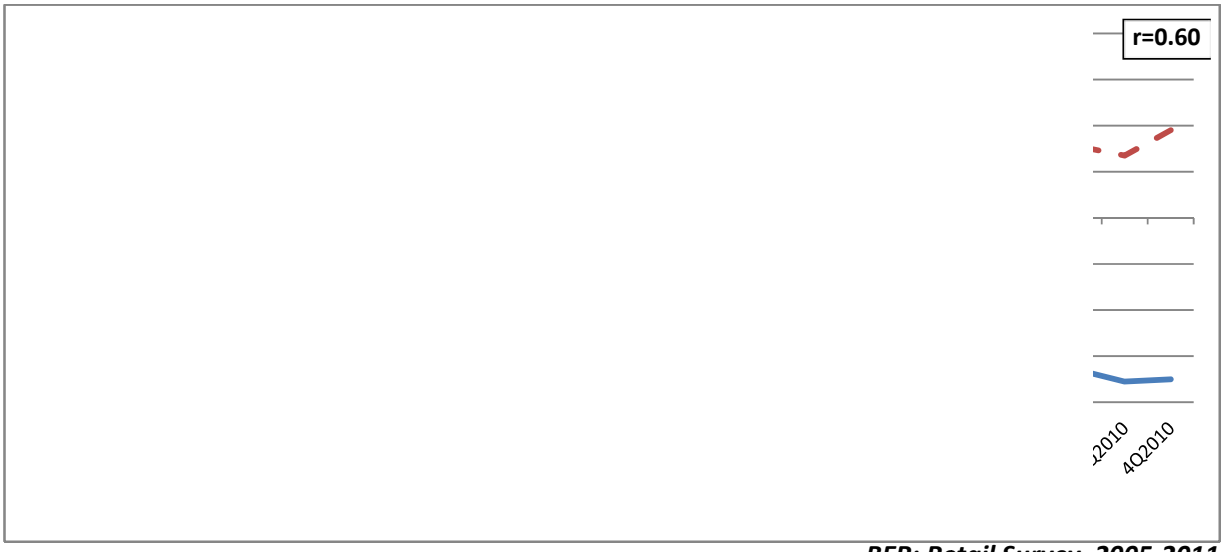

***BER: Retail Survey, 2005-2011***

Figure 3.11 indicates that there are little similarities between the economy and the volume of sales of consumer retail goods and the correlation is 0.48.

## 5.2. Profitability

Figure 3.12 below illustrates the profitability of retail sales for consumer goods in South Africa and the economy.

**Figure 3.12: Profitability: Consumer goods**




***BER: Retail Survey, 2005-2011***

Figure 3.12 indicates that the profitability of the sales of consumer represents the behaviour of the economy and can be classified as a pro-cyclic and coincidental indicator with a correlation of 0.60.

## 5.3. Deduction

Neither the volume of retail sales in terms of consumer goods nor the profitability represent the economy to such an extent that it can be used as a proxy indicator.

# 6. Hardware

The following subsection discusses the profitability and the volume of sales of hardware stores. Hardware stores sell household hardware including power tools, plumbing supplies, electrical supplies and paint.

## 6.1. Growth in Volume of Sales

Figure 3.13 below illustrates the growth in the volume of retail sales for hardware stores in South Africa and the economy.

**Figure 3.13: Growth in Retail Sales: Hardware**


***BER: Retail Survey, 2005-2011***

Figure 3.13 indicates that the growth of hardware sales represents the behaviour of the economy and can be classified as a pro-cyclic and coincidental indicator. The correlation is 0.90.

## 6.2. Profitability

Figure 3.14 below illustrates the profitability of hardware sales in South Africa and the economy.

**Figure 3.14: Profitability: Hardware**


***BER: Retail Survey, 2005-2011***

Figure 3.14 indicates a relationship between the economy and the profitability of hardware stores, although the proxy is not as accurate as the volume of sales in hardware stores. The correlation is 0.85, indicating a strong relationship between the proxy and the economy.

## 6.3. Deduction

From this subsection it can be seen that both the volume of sales in hardware stores and the profitability represents the behaviour of the economy. The relationships can be classified as a pro-cyclic and coincidental indicator and are measured at a correlation of 0.90 and 0.85 respectively.

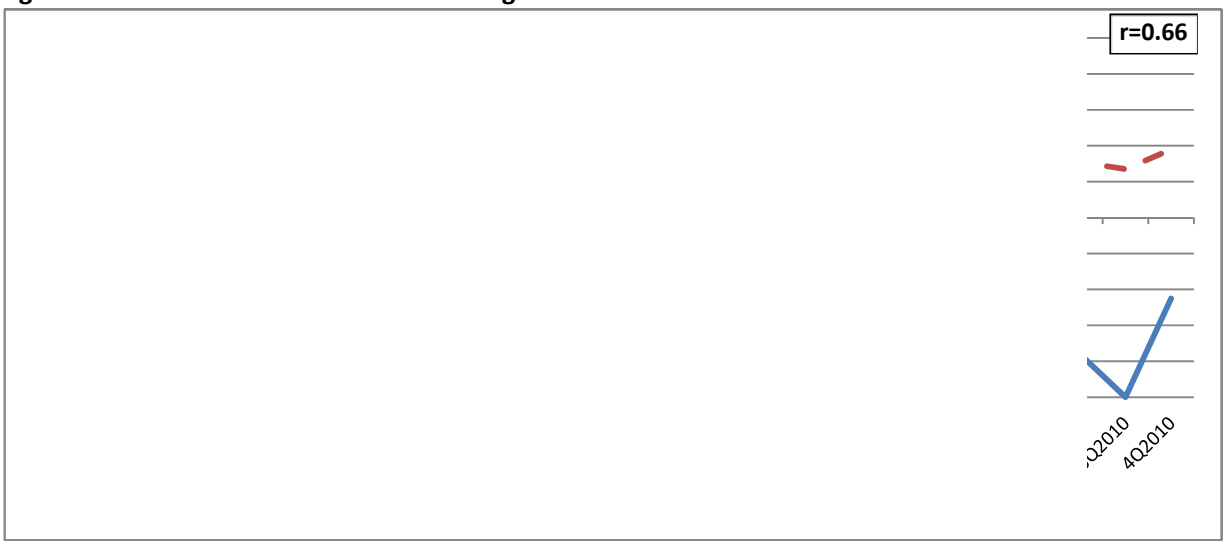
## 7. Building Materials

The following subsection discusses the profitability and the volume of sales of building materials. Building materials are closely related to hardware stores (as hardware stores tend to stock building supplies), as well as to the building activity discussed earlier in the dissertation.

### 7.1. Growth in Volume of Sales

Figure 3.15 below illustrates the growth in the volume of building material sold in South Africa and the economy.

**Figure 3.15: Growth in Retail Sales: Building Materials**




***BER: Retail Survey, 2005-2011***

Figure 3.15 indicates that although some similarities exist between the economy and the volume of building material sold in the long run, the proxy does not represent the economy in enough clarity to be used for economic modelling. The correlation is 0.66.

### 7.2. Profitability

Figure 3.16 below illustrates the profitability of building material sales in South Africa and the economy.

**Figure 3.16: Profitability: Building Materials**


***BER: Retail Survey, 2005-2011***

Figure 3.16 illustrates that the profitability of building materials fluctuates heavily over time and can accordingly not be used as a reliable proxy indicator. The correlation is measured at 0.62.

## 7.3. Deduction

Although some similarities exist between the economy and the sales and profitability of building material, the indicators fluctuates a great deal over time and can accordingly not be used as reliable proxy indicators.

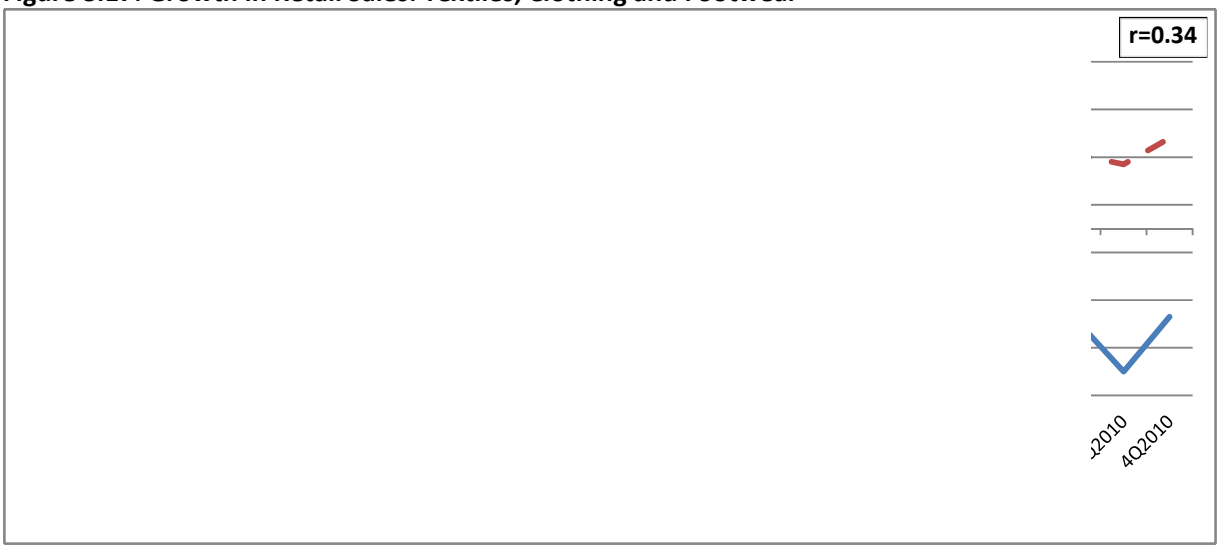
# 8. Textiles, Clothing and Footwear

The following subsection discusses the profitability and the volume of sales of textiles, clothing and footwear retailers in South Africa.

## 8.1. Growth in Volume of Sales

Figure 3.17 below shows the growth in the volume of textiles, clothing and footwear sold in South Africa and the economy.

**Figure 3.17: Growth in Retail Sales: Textiles, Clothing and Footwear**



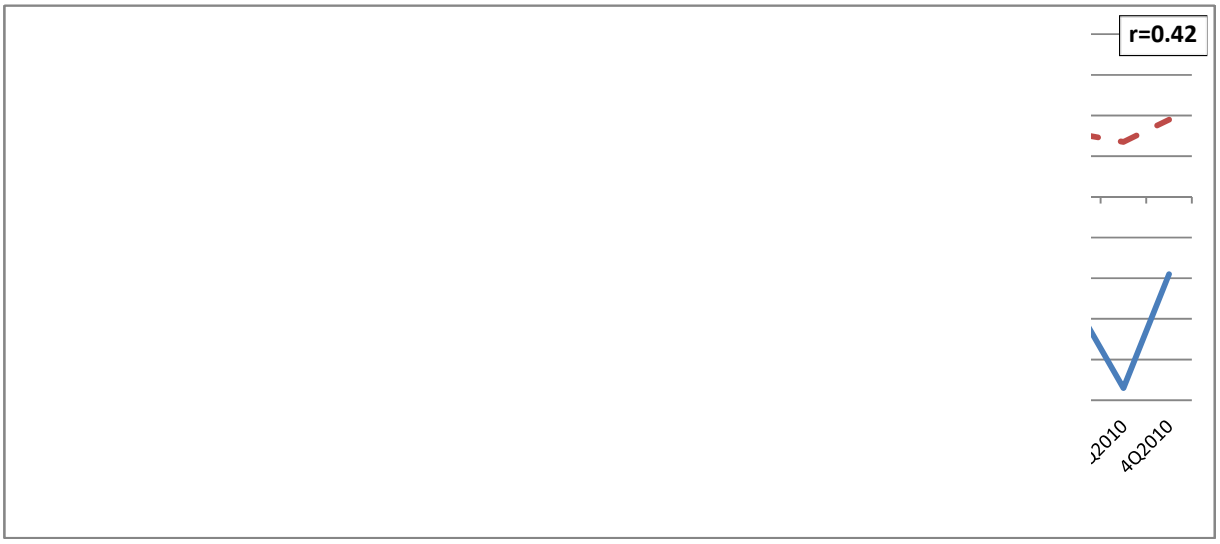

***BER: Retail Survey, 2005-2011***

Figure 3.17 indicates that there are major differences between the economy and the volume of textiles, clothing and footwear sold, resulting in an acyclic relationship with a correlation of 0.34.

## 8.2. Profitability

Figure 3.18 below illustrates the profitability of textiles, clothing and footwear sales in South Africa.

**Figure 3.18: Profitability: Textiles, Clothing and Footwear**




***BER: Retail Survey, 2005-2011***

Figure 3.18 indicates that although some similarities exist between the economy and the profitability of retailers that sell textiles, clothing and footwear in the long run, the proxy does not represent the economy in enough clarity to be used for economic modelling.

## 8.3. Deduction

From this subsection it can be seen that although some similarities exist between the economy and retailers that sell textiles, clothing and footwear; the proxy indicator fluctuates too greatly over time and can accordingly not be used for reliable economic modelling.

# 9. Food, Beverages and Tobacco

The following subsection discusses the profitability and the volume of sales of food, beverages and tobacco retailers in South Africa.

## 9.1. Growth in Volume of Sales

Figure 3.19 below illustrates the growth in the volume of food, beverages and tobacco sold in South Africa and the economy.

**Figure 3.19: Growth in Retail Sales: Food, Beverages and Tobacco**

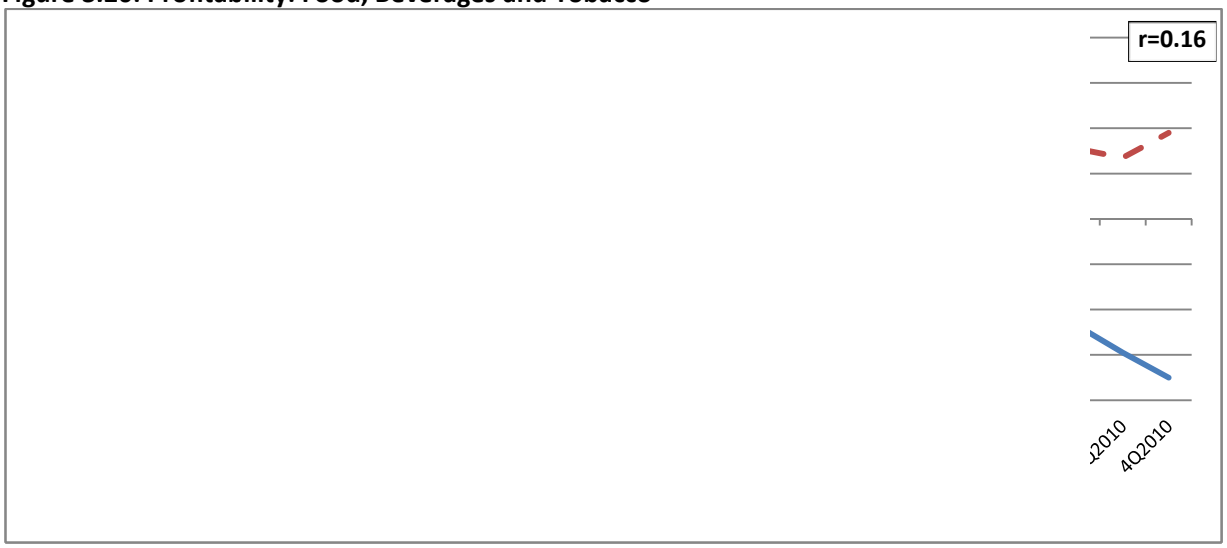

***BER: Retail Survey, 2005-2011***

Figure 3.19 indicates that there are limited similarities between the economy and the volume of food, beverages and tobacco sold, and that the proxy can accordingly be classified as acyclic. The correlation is measured at 0.10.

## 9.2. Profitability

Figure 3.20 below illustrates the profitability of food, beverages and tobacco sales in South Africa and the economy.

**Figure 3.20: Profitability: Food, Beverages and Tobacco**




***BER: Retail Survey, 2005-2011***

Figure 3.20 shows that although some similarities exist between the economy and the profitability of retailers that sell food, beverages and tobacco, the proxy does not represent the economy enough to be used for economic modelling. The correlation is 0.16.

## 9.3. Deduction

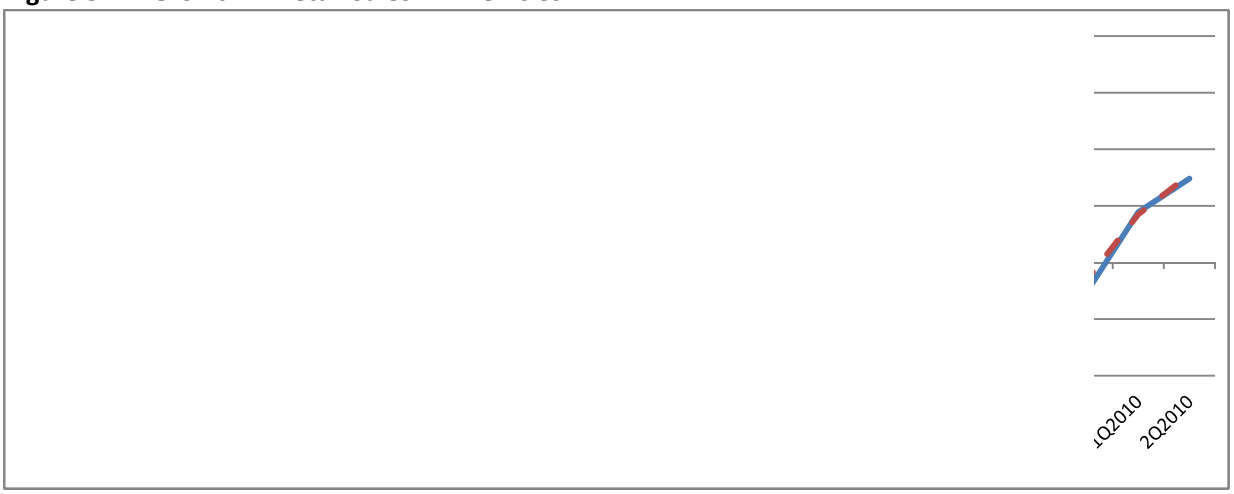
Although some similarities exist between the economy and retailers that sell food, beverages and tobacco; the proxy indicator fluctuates too greatly and can accordingly not be used for reliable economic modelling.

## 10. Motor vehicles

The following subsection discusses the profitability and the volume of sales of motor vehicles in South Africa.

Figure 3.21 below illustrates the growth in the volume of sales of all motor vehicles in South Africa and the economy.

**Figure 5.21: Growth in Retail Sales: All Vehicles**




***NAAMSA: 2005-2010***

Figure 3.21 indicates that the growth and decline of motor vehicle sale represents the general behaviour of the economy and can be classified as a pro-cyclic and leading indicator. The following subsection discusses the sales of motor vehicles in more detail in terms of new motor vehicles, used motor vehicles and spare parts for motor vehicle.

### 10.1. New Motor Vehicles

Figure 3.22 below illustrates the growth in the volume of sales for new motor vehicles in South Africa and the economy.

The growth and decline of new motor vehicle sale represents the behaviour of the economy accurately and can be classified as a pro-cyclic and leading indicator. The correlation is 0.73.

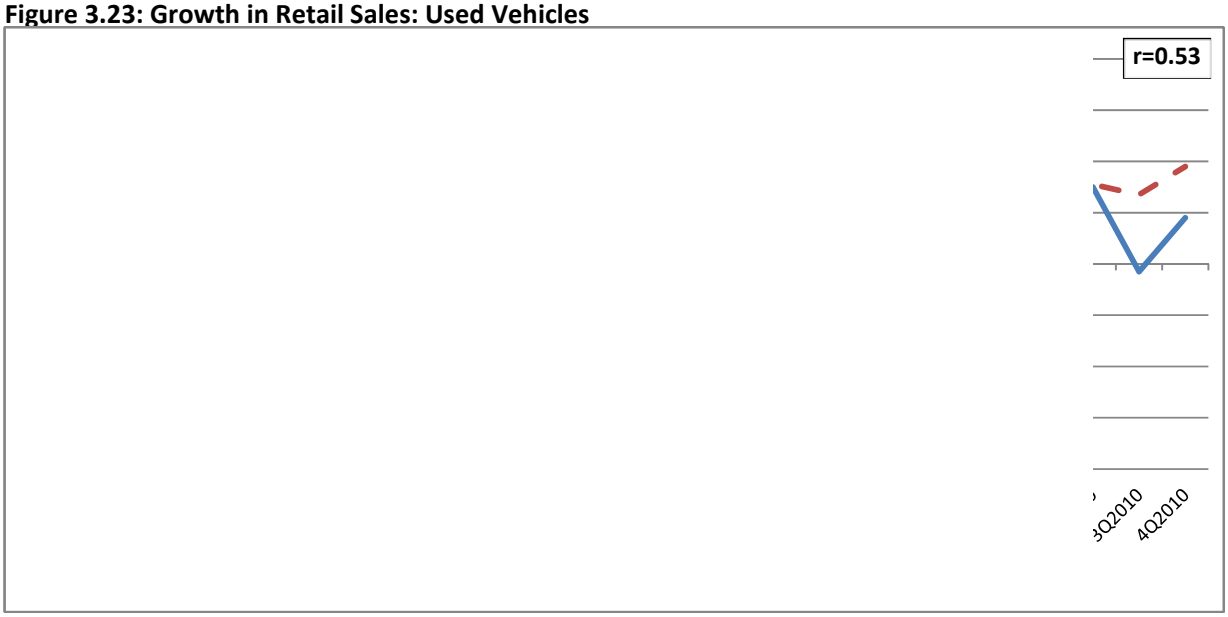
**Figure 5.22: Growth in Retail Sales: New Vehicles**


***NAAMSA: 2005-2010***

## 10.2. Used motor Vehicles

Figure 3.23 below illustrates the growth in the volume of sales for used motor vehicles in South Africa and the economy.

**Figure 3.23: Growth in Retail Sales: Used Vehicles**




***NAAMSA: 2005-2010***

Figure 3.23 indicates that the growth and decline of used motor vehicle sales generally represents the behaviour of the economy and can be classified as a pro-cyclic and leading indicator. The correlation is measured at 0.53.

## 10.3. Spare Parts

Figure 3.24 below illustrates the growth in the volume of sales for spare parts in South Africa and the economy.

**Figure 3.24: Growth in Retail Sales: Spare Parts**


***NAAMSA: 2005-2010***

Figure 3.24 indicates that the growth in spare part sales represents the behaviour of the economy accurately and can be classified as a pro-cyclic and leading indicator. The sales of vehicle parts are however not as volatile as the sales of used and new vehicles motor. The correlation is 0.80.

## 10.4. Deduction

The total sales of vehicles generally represent the behaviour of the economy. The sale of motor vehicle parts as an indicator is more accurate than used and new vehicles sales with a correlation of 0.80.

## 11. Conclusion

In this chapter a number of retail-related proxy indicators was and economic cycles in order to understand the relationship between the proxy indicator and the economy. The key findings related to the proxy indicators are discussed in Table 3.2 below.

**Table 3.2: Retail-Related Proxy Indicators: Key Findings**

| Nr | Proxy Indicator | Subcategories | Correlation | Key Findings |
|---|---|---|---|---|
| 4 | Retail Sales | Semi-Durable | 0.27 | The volume of general retail sales reflects the behaviour of the economy accurately. The relationship can be defined as pro-cyclic and coincidental. The volume of sales of durable goods reflects the behaviour of the economy more accurately than non-durable and semi-durable goods. |
| | | Durable | 0.95 | |
| | | Non-Durable | 0.62 | |
| 5 | Business Profit | Semi-Durable | 0.58 | Although the profitability of the retail sector in South Africa reflects the behaviour of the economy accurately, the profitability of durable goods reflects the behaviour of the economy the most accurately as a pro-cyclic and coincidental indicator. |
| | | Durable | 0.83 | |
| | | Non-Durable | 0.78 | |
| 6 | Non-Consumer Goods | Volume of Sales | 0.36 | Neither the profitability nor the volume of retail sales in terms of non-consumer goods represent the economy to such an extent that it can be used as a proxy indicator. |
| | | Profitability | 0.28 | |
| 7 | Consumer Goods | Volume of Sales | 0.48 | Neither the profitability nor the volume of retail sales in terms of consumer goods represent the economy to such an extent that it can be used as a proxy indicator. |
| | | Profitability | 0.60 | |
| 8 | Hardware Retailers | Volume of Sales | 0.90 | The volume of sales in hardware stores as well as the profitability represents the behaviour of the economy. The relationship between hardware stores and the economy can be classified as a pro-cyclic and coincidental indicator. |
| | | Profitability | 0.85 | |
| 9 | Building Materials | Volume of Sales | 0.66 | Although some similarities exist between the economy and the building material, the proxy fluctuates a great deal over time and can accordingly not be used as a |
| | | Profitability | 0.62 | |

| Nr | Proxy Indicator | Subcategories | Correlation | Key Findings |
|---|---|---|---|---|
| | | | | reliable proxy indicator. |
| 10 | Textiles, clothing and footwear | Volume of Sales | 0.34 | There are some similarities between the economy and retailers that sell textiles, clothing and footwear; but the proxy fluctuates too greatly over time and can accordingly not be used for reliable economic modelling. |
| | | Profitability | 0.42 | |
| 11 | Food and Beverages | Volume of Sales | 0.10 | Notwithstanding some similarities between the economy and retailers that sell food, beverages and tobacco, the proxy fluctuates a too greatly for reliable economic modelling. |
| | | Profitability | 0.16 | |
| 12 | Vehicles | New Vehicles | 0.73 | The growth spare part sales represent the behaviour of the economy more accurately than used and new vehicles. |
| | | Used Vehicles | 0.53 | |
| | | Spare Parts | 0.80 | |

# Chapter 4: Banking-Related Proxy Indicators

## 1. Introduction

In the following chapter a number of banking-related proxy indicators are compared to economic cycles in order to understand the relationship between the proxy indicator and the economy.

Table 4.1 below illustrates the banking-related proxy indicators that are discussed in the following chapter.

**Table 4.1: Banking-Related Proxy Indicators**

| Nr | Proxy Indicator | Description | Subcategories | Source |
|---|---|---|---|---|
| 13 | House bonds | Number of House bonds approved in South Africa. | | Ernst & Young: Financial Services Index (2005-2010) |
| 14 | Bank deposits | Total amount of bank deposits received by banks in South Africa. | | Ernst & Young: Financial Services Index (200-2007) |
| 15 | Savings | Total growth and decline of savings received by banks in South Africa. | Short-Term<br>Long-Term | Ernst & Young: Financial Services Index (2005-2007) |
| 16 | Banking Income | Total income of banks. | | Ernst & Young: Financial Services Index (2005-2010) |
| 17 | Business Confidence | Business Confidence of Retail Banking | | Ernst & Young: Financial Services Index (2005-2010) |

## 2. House Bonds

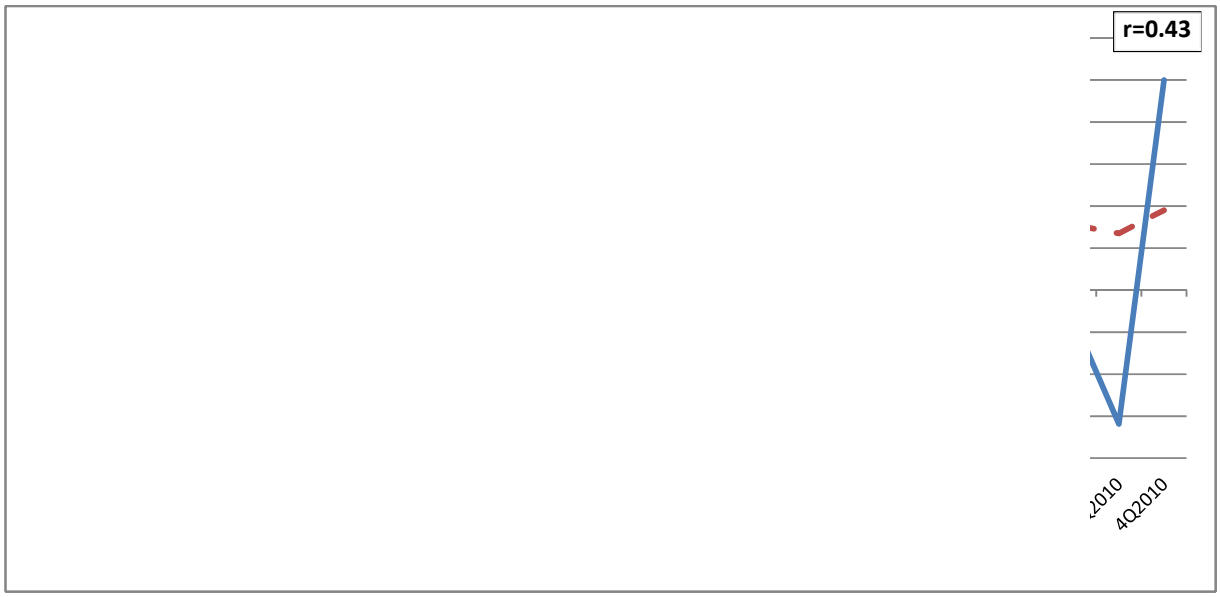
Figure 4.1 below illustrates the growth/decline in the number of housing bonds approved by all banks in South Africa and the national GDP.

**Figure 4.1: Housing Bonds Approved**


***Ernst & Young: Financial Services Index, 2005-2010***

The figure represents the true relationship between the economy and the growth in the number of housing bonds approved, but on the scale presented the relationship is difficult to analyse using the time-series analysis technique. Figure 4.2 illustrates the same information as in Figure 4.1, but the growth in building activity is illustrated as a factor of 0.1.

**Figure 4.2: Housing Bonds Approved, adjusted**



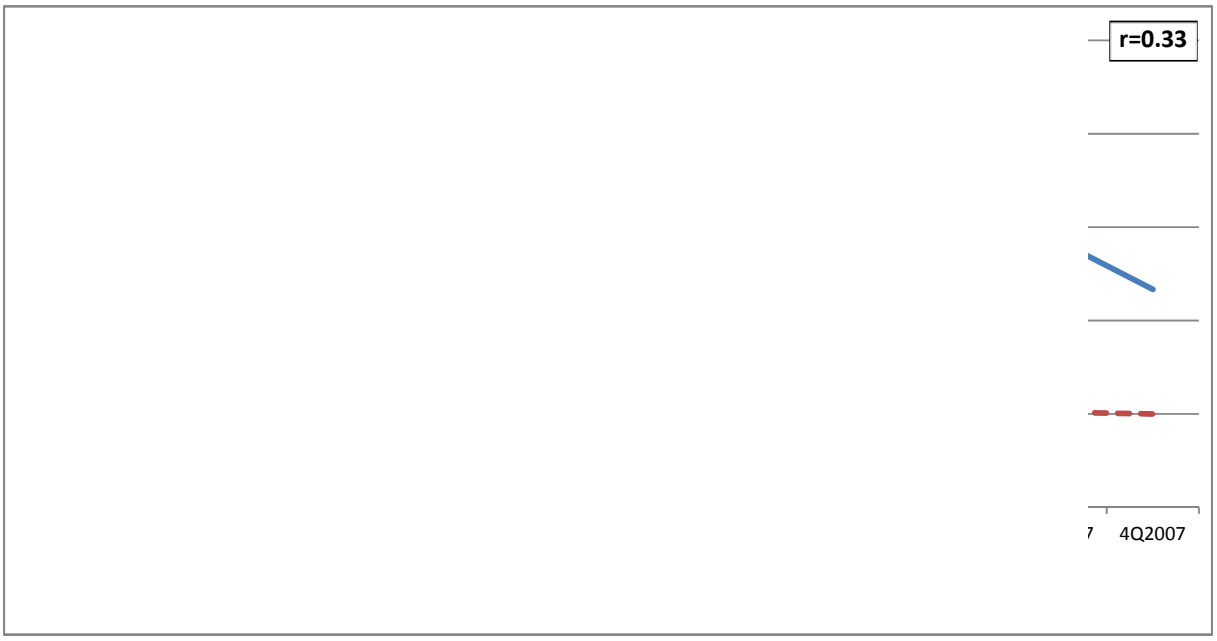

***Ernst & Young: Financial Services Index, 2005-2010***

Although some similarities exist between the economy and the number of housing bond approved, the proxy fluctuates a great deal over time and can accordingly not be used as a reliable proxy indicator.

## 3. Bank Deposits

Figure 4.3 below illustrates the growth/decline in the amount of bank deposits received by all banks in South Africa and the national GDP.

**Figure 4.3: Bank Deposits**




***Ernst & Young: Financial Services Index, 2005-2007***

The volume of bank deposits has similar attributes to that of the economy but bank deposits are distributed significantly higher than the GDP and with a correlation of 0.33.

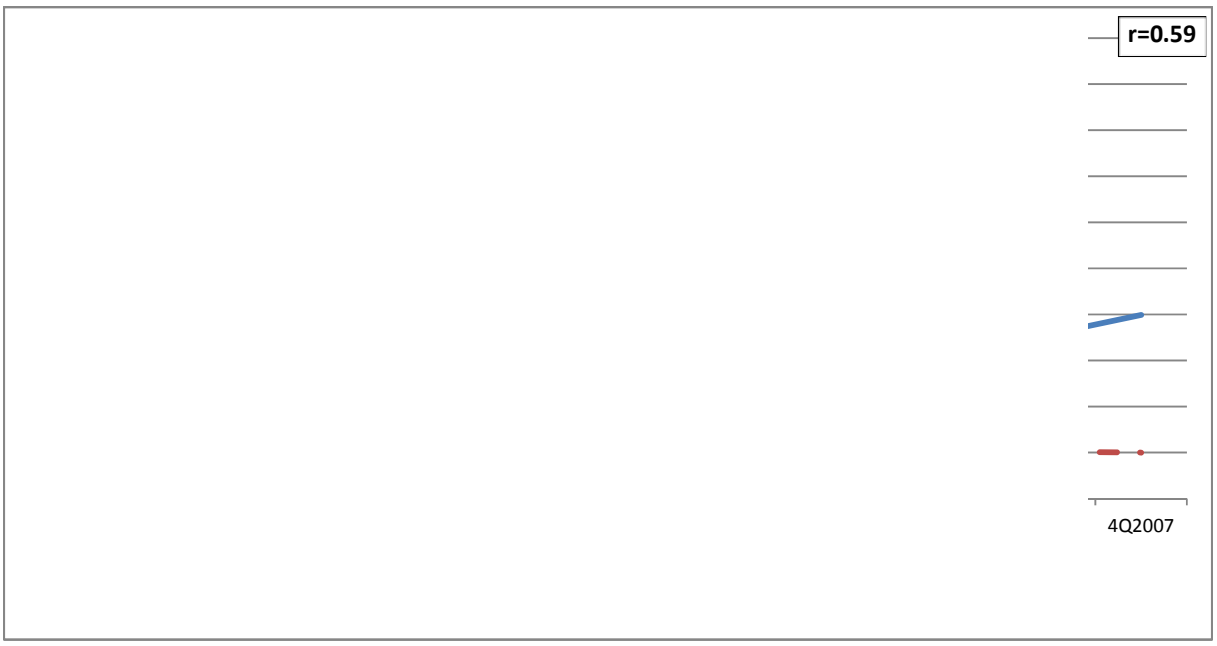
## 4. Savings

The following subsection describes the amount of banks receive for savings compared to the national GDP. The subsection is categorised according to the timeframe of the saving as either a long-term saving or a short-term saving.

## 4.1. Long-term Savings

Figure 4.4 below illustrates the growth/decline in the amount of long-term savings received by all banks in South Africa and the national GDP.

**Figure 4.4: Long-term Savings**




***Ernst & Young: Financial Services Index, 2005-2007***

Long-term savings has similar attributes to that of the economy but the growth in long-savings is significantly higher than the GDP, with a correlation of 0.59.

## 4.2. Short-term Savings

Figure 4.5 below illustrates the growth/decline in the amount of short-term savings received by all banks in South Africa and the national GDP.

Long-term savings illustrates similar behaviour compared to that of the economy but is distributed significantly higher than the GDP and with a correlation of 0.46.

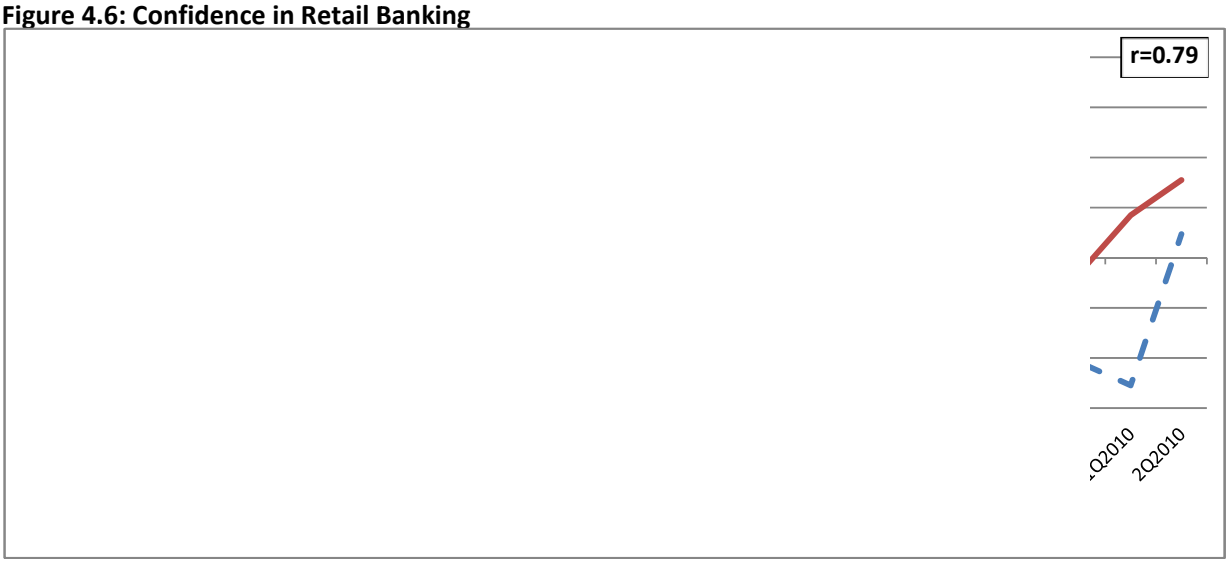
**Figure 4.5: Short-term Savings**


***Ernst & Young: Financial Services Index, 2005-2007***

## 5. Business Confidence in Retail Banking

Retail banking refers to banking in which banking institutions execute transactions directly with consumers, rather than corporations or other banks. Services offered include savings and checking accounts, mortgages, personal loans and debit/credit cards. Figure 4.6 below illustrates the growth/decline in the business confidence in retail banking in South Africa.

**Figure 4.6: Confidence in Retail Banking**



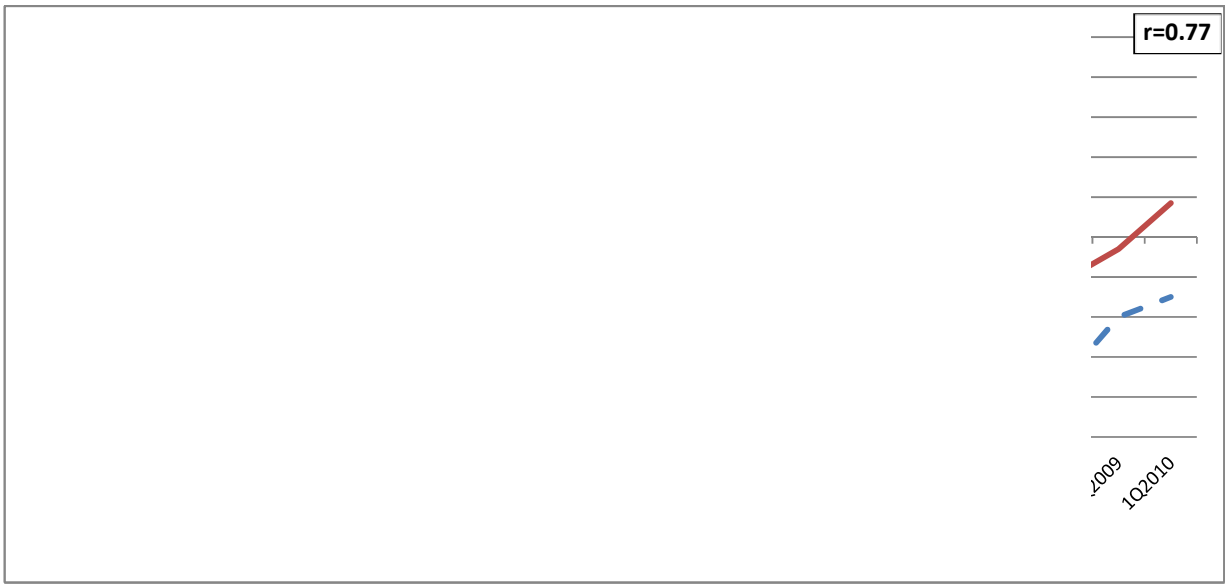

***Ernst & Young: Financial Services Index, 2005-2010***

Business confidence in retail banking accurately portrays the behaviour of the economy. Business confidence in retail banking is a pro-cyclic coincidental indicator measured at a correlation of 0.79.

## 6. Banking Income

Figure 4.7 below illustrates the growth/decline in the retail banking income in South Africa and the national GDP.

**Figure 4.7: Retail Banking Income**




***Ernst & Young: Financial Services Index, 2005-2010***

Retail banking income represents the general trends in the behaviour of the economy. Retail banking income is a pro-cyclic leading indicator but does not represent the behaviour of the economy as effectively as business confidence in retail banking. The correlation is 0.77.

## 7. Conclusion

In this chapter a number of banking-related proxy indicators were compared to economic cycles in order to understand the relationship between the proxy indicator and the economy. The key findings related to the proxy indicators are discussed in Table 4.2 below.

**Table 4.2: Banking-Related Proxy Indicators: Key Findings**

| Nr | Proxy Indicator | Sub-Categories | Correlation | Key Findings |
|---|---|---|---|---|
| 13 | House bonds | | 0.43 | Although some similarities exist between the economy and the number of housing bond approved, the proxy fluctuates a great deal over time and can accordingly not be used as a reliable proxy indicator. |
| 14 | Bank deposits | | 0.33 | The volume of bank deposits represents the general behaviour of the economy but with a low correlation of 0.33. |
| 15 | Savings | Short-Term | 0.59 | Short and long-term savings is an indicator of the behaviour of the economy but savings cannot be used as an accurate measure for the economy. |
| | | Long-Term | 0.46 | |
| 16 | Business Confidence | | 0.77 | Business confidence in retail banking is an accurate indicator of the behaviour of the economy. Business confidence in retail banking is a pro-cyclic coincidental indicator. |
| 17 | Banking Income | | 0.79 | Retail banking income represents the general trends in the behaviour of the economy. Retail banking income is a pro-cyclic leading indicator but does not represent the behaviour of the economy as effectively as business confidence in retail banking. |

# Chapter 5: Additional Proxy Indicators

## 1. Introduction

A number of proxy indicators not relating to banking, retail or property are compared to economic cycles in order to understand the relationship between the proxy indicator and the economy.

Table 5.1 below illustrates the proxy indicators that are discussed in the following chapter.

**Table 5.1: Other Proxy Indicators**

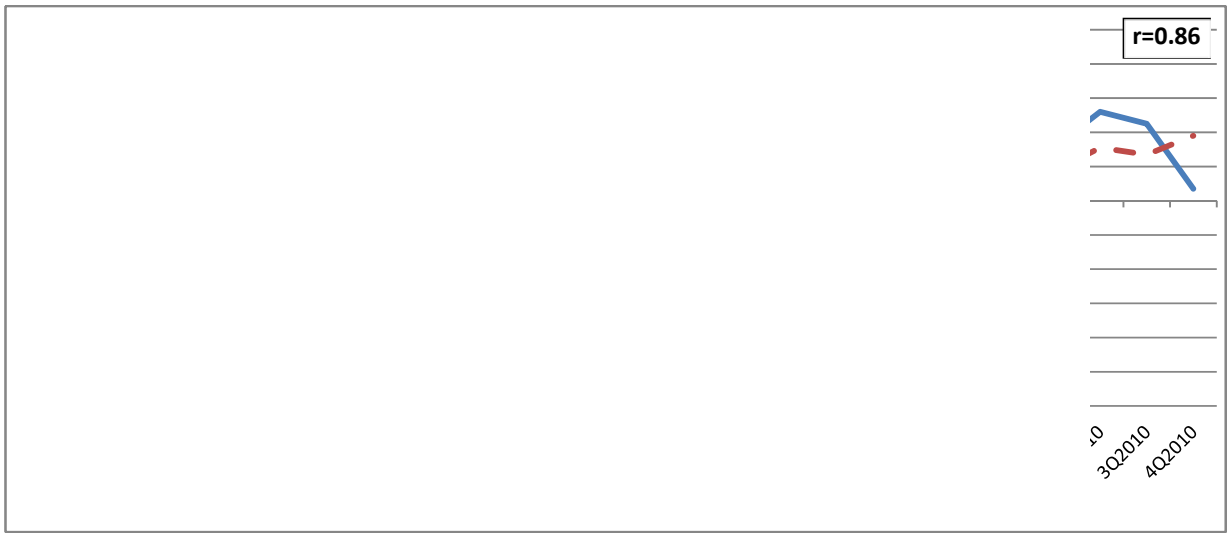
| Nr | Proxy Indicator | Description | Source |
|---|---|---|---|
| 18 | Fuel Consumption | The growth or decline of fuel demand in South Africa compared to economic fluctuations. | SAPIA |
| 19 | Electricity use | The growth or decline of electricity demand in South Africa compared to economic fluctuations. | Quantec |
| 20 | Civil Cases | The growth or decline of civil cases in South Africa compared to economic fluctuations. | Quantec |
| 21 | Reported Crime | The growth or decline crime activity in South Africa compared to economic fluctuations. | SAPD |

## 2. Fuel Sales

According to Shenk (2011), fuel demand raises as the economy rises. However the economy is not the only factor that influences the demand for fuel as the international oil price has a major effect on the South African fuel price.

Figure 5.1 below illustrates the growth/decline for fuel sales in South Africa and the national GDP.

**Figure 5.1: Fuel Demand**




***SAPIA: 2005-2010***

Fuel sales represent the general trends in the behaviour of the economy, although it is important to note that the demand for fuel is largely influenced by other variables such as the global oil price and the strength of the South African currency in international markets. The correlation of the relationship 0.86.

## 3. Electricity Use

The U.S. Department of Energy (2009) states that the growth in the use of electricity has mirrored GDP growth more closely than any other source. The tie between electricity use and the economy is the product of many factors, including the development of advanced electric technologies, population changes, and the relatively stable price of electricity.

Figure 5.2 below illustrates the growth/decline in the demand for electricity in South Africa and the national GDP.

The demand for electricity in South Africa reflects the behaviour of the economy accurately. The relationship can accordingly be defined as a pro-cyclic leading indicator. The correlation is measured at 0.71.

**Figure 5.2: Electricity Use**


***Quantec: 2005-2010***

4. Civil cases issued for debt

Figure 5.3 below illustrates the growth/decline in the number of civil cases recorded and summonses issued for debt in South Africa and the national GDP.

**Figure 5.3: Civil cases issued for debt**


***Quantec: 2005-2010***

The number of civil cases issued does not represent the general trends in the behaviour of the economy. The number of civil cases has vital deviations from the behaviour of the economy and can accordingly not be used as a reliable proxy indicator. The correlation is -0.12.

## 5. Crime Rate

Simon Hakim (cited by Wishingrad, 2008) argues that crime is strongly related to the economy as unemployment is one of the main economic factors that affect crime rates.

Figure 5.4 below illustrates the growth/decline in reported crimes in South Africa and the national GDP.

**Figure 5.4: Crime Rates**


***SAPD: 2005-2010***

Figure 5.4 shows that the key trend in the relationship between the economy and crime rates are that when the economy moves into a recession, the crime rate increases significantly. The relationship can as a consequence be identified as an anti-cyclical, with a correlation of -0.42.

## 6. Conclusion

In this chapter a number indicators not relating to banking, retail or property was and economic cycles in order to understand the relationship between the proxy indicator and the economy. The key findings related to the proxy indicators are discussed in Table 5.2 below.

**Table 5.2: Other Proxy Indicators: Key Findings**

| Nr | Proxy Indicator | Correlation | Key Findings |
|---|---|---|---|
| 18 | Fuel Demand | 0.86 | Shenk (2011) argues that fuel demand increases as economic the economy rises and that the demand for fuel represents the general trends in the behaviour of the economy. The same can be said for the demand for fuel in South Africa that correlates 0.86 with the economy. It is important to note that the demand for fuel is largely influenced by other variables such as the global oil price and the strength of the South African currency in international markets. |
| 19 | Electricity use | 0.71 | The demand for electricity in South Africa reflects the behaviour of the economy accurately. The relationship can accordingly be defined as a pro-cyclic leading indicator. |
| 20 | Civil Cases | -0.12 | Although the number of civil cases issued represents the general trends in the behaviour of the economy in an anti-cyclical nature, the number of civil cases has vital deviations from the behaviour of the economy and can accordingly not be used as a reliable proxy indicator. |
| 21 | Reported Crime | -0.42 | The key trend in the relationship between the economy and crime rates is that when the economy moves into a recession, the crime rate increases significantly. Although the accuracy is limited, because of its sensitivity towards economic fluctuations, the crime rate can indicate a regression in the economy. |

# Chapter 6: Research Results

***"Three economists went out hunting, and came across a large deer. The first economist fired, but missed, by a meter to the left. The second economist fired, but also missed, by a meter to the right. The third econometrician didn't fire, but shouted in triumph, we got it! We got it! "***

***--Unknown (2012)***

## 1. Introduction

The following chapter presents an overview of the key findings and a comparison on the proxy indicators discussed in the section two. The chapter commences with an overview of the proxy indicators tested in terms of their correlation to the economy, where after the relationship of the accurate proxy indicators are discussed in more detail.

## 2. Proxy Indicators and Correlation

As discussed in section two, chapter one, the correlation coefficient is an indication of how strong a linear relationship exists between two variables. If the correlation coefficient is close to +1.0, then there is a strong positive linear relationship between the variables, if the correlation coefficient is close to -1.0, then there is a strong negative linear relationship and if the correlation coefficient is close to zero, no relationship exist between the variables. Correlations above 0.80 are accepted as high and suitable for economic modelling and forecasting (Ezekiel & Fox, 1959).

While correlation coefficients are normally reported as **r**, squaring the correlation simplifies the analysis and can provide valuable information. This squared correlation coefficient is called a Coefficient of Determination. The Coefficient of Determination ($r^2$) is equal to the percent of the variation in one variable that is related to the variation in the other (Jaeger, 1990). The coefficient of determination is generally used in the context of statistical models whose main purpose is the prediction of future outcomes on the basis of other related information. It provides a measure of how well future outcomes are likely to be predicted by the model (Steel & Torrie, 1960).

Table 6.1 below illustrates the proxy indicators tested in this section according to their correlation and coefficient of determination.

**Table 6.1: Proxy Indicator Correlation**

| Nr | Proxy Indicator | Subcategories | Correlation (r) | Coefficient of Determination ($r^2$) |
|---|---|---|---|---|
| **Property** | | | | |
| 1 | Number of Residential properties sold | Affordable Housing | 0.66 | 44% |
| | | **Middle Class Housing** | **0.81** | **66%** |
| | | High-end Housing | 0.65 | 42% |
| 2 | Growth in Building activity | **Residential** | **0.82** | **67%** |
| | | **Non-residential** | **0.80** | **64%** |
| 3 | Submission of Building Plans | **Residential** | **0.80** | **64%** |
| | | Non-residential | 0.54 | 29% |
| | | Additions | 0.59 | 35% |
| **Retail** | | | | |
| 4 | Retail Sales | Semi-Durable | 0.27 | 7% |
| | | **Durable** | **0.95** | **90%** |
| | | Non-Durable | 0.62 | 38% |
| 5 | Business Profit | Semi-Durable | 0.58 | 34% |
| | | **Durable** | **0.83** | **69%** |
| | | Non-Durable | 0.78 | 61% |
| 6 | Non-Consumer Goods | Volume of Sales | 0.36 | 13% |
| | | Profitability | 0.28 | 8% |
| 7 | Consumer Goods | Volume of Sales | 0.48 | 23% |
| | | Profitability | 0.60 | 36% |
| 8 | Hardware Retailers | **Volume of Sales** | **0.90** | **81%** |
| | | **Profitability** | **0.85** | **72%** |
| 9 | Building Materials | Volume of Sales | 0.66 | 44% |
| | | Profitability | 0.62 | 38% |
| 10 | Textiles, clothing and | Volume of Sales | 0.34 | 12% |

| Nr | Proxy Indicator | Subcategories | Correlation (r) | Coefficient of Determination ($r^2$) |
|---|---|---|---|---|
| | footwear | Profitability | 0.42 | 18% |
| 11 | Food and Beverages | Volume of Sales | 0.10 | 1% |
| | | Profitability | 0.16 | 3% |
| 12 | Vehicles | New Vehicles | 0.73 | 53% |
| | | Used Vehicles | 0.53 | 28% |
| | | **Spare Parts** | **0.80** | **64%** |
| **Banking** | | | | |
| 13 | House bonds | | 0.43 | 18% |
| 14 | Bank deposits | | 0.33 | 11% |
| 15 | Savings | Short-term | 0.59 | 35% |
| | | Long-term | 0.46 | 21% |
| 16 | Banking Income | | 0.77 | 59% |
| 17 | Business Confidence | | 0.79 | 62% |
| **Other** | | | | |
| 18 | **Fuel Consumption** | | **0.86** | **74%** |
| 19 | Electricity use | | 0.71 | 50% |
| 20 | Civil Cases | | -0.12 | 1% |
| 21 | Reported Crime | | -0.42 | 18% |

Table 6.1 above indicates that the accuracy of the relationship between the economy and the proxy indicators (expressed in terms of correlation and correlation squared), differ substantially. A key aspect to take into account when working with correlations is not to assume a correlation means that a change in one variable causes a change in another. Correlations above 0.80 are generally considered as high. It is proposed from Table 6.1 that there are 10 proxy indicators that represent the economy with correlations of above 0.80. A correlation of 0.80 suggests a strong linear relationship between the variables.

## 3. Proxy Indicators used in Empirical Model

The attributes of each proxy indicator with a correlation of 0.80 and higher is discussed in more detail in Table 6.2 below.

**Table 6.2: Proxy Indicators used in Empirical Model**

| Nr | Proxy Indicator | Attributes |
|---|---|---|
| 1 | Number of Middle Class Residential properties sold | The number of middle class houses sold illustrates similar behaviour as the economy, with a leading tendency of approximately three annual quarters. The correlation between the variables is 0.81 and the coefficient of determination at 66%. |
| 2 | Growth in Residential Building Activity | There is a strong correlation of 0.82 between the growth in residential building activity and the economy even though the growth in residential building activity is lower than the average growth in the economy. The relationship is pro-cyclic and to some extent leading. The coefficient of determination at 67%. |
| 3 | Growth in Non-residential Building Activity | There is a positive correlation between non-residential building activity and the economy. The relationship is pro-cyclic with a correlation of 0.80 and a coefficient of determination at 64%. |
| 4 | Submission of residential building Plans | The relationship between the number of residential building plans passed and the economy is pro-cyclic, measured at a correlation of 0.80 and a coefficient of determination at 64%. |
| 5 | Retail Sales of Durable Goods | The volume of sales of durable goods reflects the behaviour of the economy the most accurately, with a correlation of 0.95. The growths in the volume of durable retail sales are more sensitive in times of economic stagnations and recessions. The relationship can accordingly be defined as a pro-cyclic coincidental indicator with a coefficient of determination at 90%. |
| 6 | Business Profit of Durable Goods Retailers | The profitability of the retail sector in terms of durable goods in South Africa reflects the behaviour of the economy the most accurately. The relationship can accordingly be defined as a pro-cyclic coincidental indicator measured at a correlation of 0.83 and a coefficient of determination at 69%. |

| Nr | Proxy Indicator | Attributes |
|---|---|---|
| 7 | Volume of Sales of Hardware Retailers | The growth of hardware sales represents the behaviour of the economy accurately and can be classified as a pro-cyclic and coincidental indicator. The correlation is measured at 0.90 and a coefficient of determination at 81%. |
| 8 | Profitability of Hardware Retailers | Key similarities exist between the economy and the profitability of hardware stores, although the proxy is not as accurate as the volume of sales in hardware stores. The correlation is measured at 0.85 and with a coefficient of determination at 72%. |
| 9 | The Volume of Sales of Spare Parts for Vehicles | The growth of sales in spare parts represents the behaviour of the economy accurately and can be classified as a pro-cyclic and coincidental indicator. The correlation is measured at 0.80 and the coefficient of determination at 64%. |
| 10 | Fuel Consumption | The demand for fuel represents the general trends in the behaviour of the economy, although it is important to note that the demand for fuel is largely influenced by other variables such as the global oil price and the strength of the South African currency in international markets. The proxy is a coincidental and pro-cyclic with a correlation of 0.86 and a coefficient of determination at 74%. |


# Section 3: Empirical Research

# Chapter 1: Research Methodology

***"No question is so difficult to answer as that to which the answer is obvious."***

***--George Bernard Shaw (1932)***

## 1. Introduction

The following chapter provides an overview of the study methodology used in the second section of the study and includes the interview schedule and an overview of the study areas.

## 2. Data Collection

In the **second section** of the dissertation, the findings of the first section are tested against a new set of primary data obtained in field research. The second section made use of **primary data** obtained from a number of interviews (51). The aim of the interviews was to investigate if the relationship identified between the proxy indicators and the economy in the first section of the study was born out by the experiences of managers of the local economy. These interviews were conducted in three study areas described in more detail later in the chapter.

Berg (1989:6) and Creswell (as sited in Masha, 2000: 5) both argue that qualitative techniques allow the researcher to obtain personal opinions and perceptions of people. Qualitative research is interpretive research (Creswell, 1994 as sited in Masha, 2000: 6) and for this dissertation the researcher extensively makes use of personal opinions from various managers on local level. "Interviewing is usually defined simply as a conversation with a person" (Berg, 1989). The aim of the questionnaire was to ask simple questions in terms of the experience of the interviewee with the set proxy indicator. Bailey argues that using interviews to collect data poses various advantages including its flexibility, high response and completion rate. On the other hand, using interviews to collect data also presents disadvantages such as the high time and costs implications associated with interviews (Bailey, 1987:175).

According to Chadwick *et al* (1984) the amount of structure that the researcher imposes on the respondent is one of the major differences that exist among interviews. Interviews can range from

highly structured to largely unstructured where in a highly structured interview there is very little deviation. Although specific questions are asked in the interviews, respondents were given freedom in answering the questions in the manner they choose. Questions were therefore open ended.

## 3. Interview Schedule

An interview schedule was developed for each proxy indicator and for each study areas, thus there are 30 individual interview schedules. Although the basis of the question for each questionnaire is the same, there are limited changes in terms of the figures provided that represents the proxy indicator and the chosen proxy for each interview schedule.

The following interview schedule is an example of the interview schedule questioned in Delmas to identify the relationship between the local economy and sales of medium residential housing.

***Dear Sir/Madam***

*Thank you for agreeing to participate in this research project. The aim of this component of the study is to determine the accuracy of a set of proxy indicators aimed at measuring the local economy. The research project aims to explore alternative ways in which local economies can be measured and better understood.*

*Your participation is anonymous and voluntary. However, your input will be greatly appreciated, as it is of great importance to the outcome of this study. Please base all information provided by you on personal experiences and knowledge pertaining to this particular matter.*

*Further note that no personal or business information will be recorded or portrayed in the results of the study.*

*Please note that all information gathered will be treated with the strictest confidentiality as stipulated by the University of Pretoria's Code of Ethics for Research. Further information in this regard can be obtained from my supervisor, Prof Mark Oranje at mark.oranje@up.ac.za.*

**Middle Class Residential Market**

1. According to your experience of the local economy of your area, does the local business/economic climate affect the number of middle class residential units sold (120m$^2$-220m$^2$), and in what way?

   ……

2. According to your experience of the local economy of your area, did the global/national financial crisis affect the number of middle class residential units sold? IF so, how?

   ……

3. Please consider the figure provided. The figure illustrates a graphical estimate of the local economic cycle between 2005 and 2010. Can you graphically illustrate the number of middle class residential units sold to these economic trends?

   ……

4. According to your experience of the local economy of your area, are you of the opinion that the number of middle class residential units sold is an accurate indicator of the local economy? Why?

   ……

## 4. Interviews

By means of local directories, knowledge of the study areas and use of the internet a list of all the institutions and businesses that correspond with the identified proxy indicators were developed. Two businesses/interviewees were randomly selected from this list for the study. On the day of the interview, the researcher approached the business/institution/shop, and interviewed the manager/owner/financial manager. The aim of the interview was to identify if the proxy indicator (for example the sale of residential properties), show similar trends as the economy. The interviewees were thus randomly selected on the basis of their knowledge of the business. In cases where one or both of the interviewees did not have sufficient knowledge of the said proxy indicator, the interview was terminated and the interviewer moved on to the third interviewee on the list (where possible). In selected cases there were not two interviewees available per proxy indicator (as in the case of Delmas as discussed later in this section), and only one interviewee were interviewed as set out in Table 1.1.

Table 1.1 below gives a brief overview of the proxy indicators that were tested in the fieldwork including the interviewees and the number of interviews per study area.

**Table 1.1: Proxy Indicators to be tested**

| Nr | Proxy Indicator | Interviewee | Number of Interviews | |
|---|---|---|---|---|
| 1 | Number of Middle Class Residential properties sold | Established Real Estate Agents | Brits | 2 |
| | | | Delmas | 1 |
| | | | Bela-Bela | 2 |
| 2 | Growth in Residential Building Activity | Construction Sector Supplier Managers | Brits | 2 |
| | | | Delmas | 1 |
| | | | Bela-Bela | 2 |
| 3 | Growth in Non-residential Building Activity | Construction Sector Suppliers Managers | Brits | 2 |
| | | | Delmas | 1 |
| | | | Bela-Bela | 2 |
| 4 | Submission of residential building | Municipality Official in Building Plans | Brits | 1 |

| Nr | Proxy Indicator | Interviewee | Number of Interviews | |
|---|---|---|---|---|
| | Plans | Division | Delmas | 1 |
| | | | Bela-Bela | - |
| 5 | Retail Sales of Durable Goods | Durable Goods Store Managers | Brits | 2 |
| | | | Delmas | 2 |
| | | | Bela-Bela | 2 |
| 6 | Business Profit of Durable Goods Retailers | Durable Goods Store Managers | Brits | 2 |
| | | | Delmas | 2 |
| | | | Bela-Bela | 2 |
| 7 | Volume of Sales of Hardware Retailers | Hardware Retailer Managers | Brits | 2 |
| | | | Delmas | 1 |
| | | | Bela-Bela | 2 |
| 8 | Profitability of Hardware Retailers | Hardware Retailer Managers | Brits | 2 |
| | | | Delmas | 1 |
| | | | Bela-Bela | 2 |
| 9 | The Volume of Sales of Spare Parts for Vehicles | Spare part Stores Managers | Brits | 2 |
| | | | Delmas | 2 |
| | | | Bela-Bela | 2 |
| 10 | Fuel Consumption | Fuel Stations Managers | Brits | 2 |
| | | | Delmas | 2 |
| | | | Bela-Bela | 2 |
| **TOTAL** | | | **51** | |

Fifty one (51) interviews in total were conducted in the week of 19-23 September 2011 in the three study areas. Of the total interviews, nineteen (19) interviews were conducted in Brits, eighteen (18) interviews in Bela-Bela and fourteen (14) interviews in Delmas. Delmas is the smallest of the three study areas, and accordingly has a smaller distribution of retail stores and real estate agents etc. It was

accordingly not possible to conduct more interviews in the study area as there were for example only one estate agent available and one construction goods supplier.

*Please note that to ensure the confidentiality of the interviewees the identity of the interviewees and the institutions they represent cannot be displayed in the dissertation.*

## 5. Overview of Study Areas

The following subsection provides a brief overview of the three study areas identified for the primary research in the **second section** of the study. The areas were strategically selected in three different provinces and municipalities with a variety of economic activity and demographic trends. The areas were selected to determine if the concept of using proxy indicators to measure the local economy can potentially provide vital local level information in South Africa.

The selection of the areas was based on the following criteria:

- The towns should be from three different provinces and municipalities in order to identify if there are any attributes specific to a particular region.
- The towns should be diverse in terms of population size, in order to identify if the size of the population can have an effect on the accuracy of the proxy.
- The towns should be diverse in terms of the economy, in order to identify if the structure and composition of the economy have an effect on the accuracy of the proxy.
- The towns should be the only town in the local municipality, as the economic trends used for comparison in the second section of the study is only available on municipal level.
- The areas should be in close proximity to Gauteng, to minimise the travel time and costs.

Using the criteria Brits, Bela-Bela and Delmas were selected as the areas for the second section of the study.

Table 1.2 provides a brief overview of the study areas.

**Table 1.2: Overview of Study Areas**

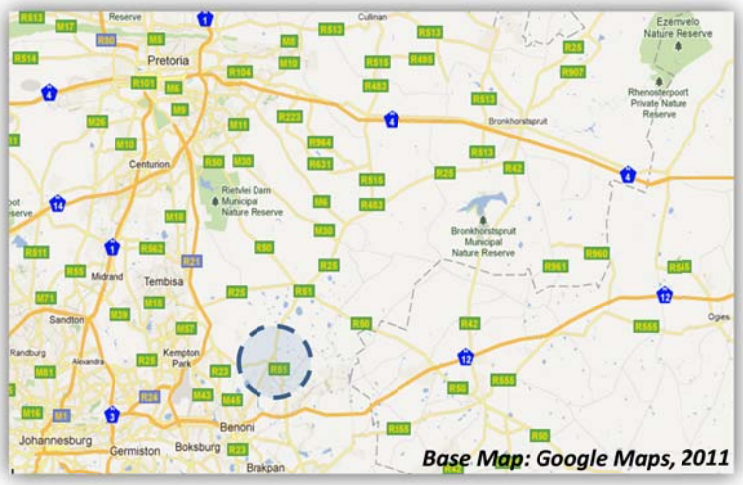
| Study Area | Province | Municipality | Population | Main Economic Sector |
|---|---|---|---|---|
| **Delmas** | Mpumalanga | Victor Khanye Local Municipality | 51,800 | Manufacturing |
| **Brits** | North West | Madibeng Local Municipality | 355,000 | Mining |
| **Bela-Bela** | Limpopo | Bela-Bela Local Municipality | 58,800 | Business Services |

Each study area is briefly be described in the following pages according to its demographic (population growth and household overview) and economic conditions. It should however be noted that further more in depth research are needed in a variety of areas (especially rural areas), before the model can be generalised in all local conditions in South Africa.

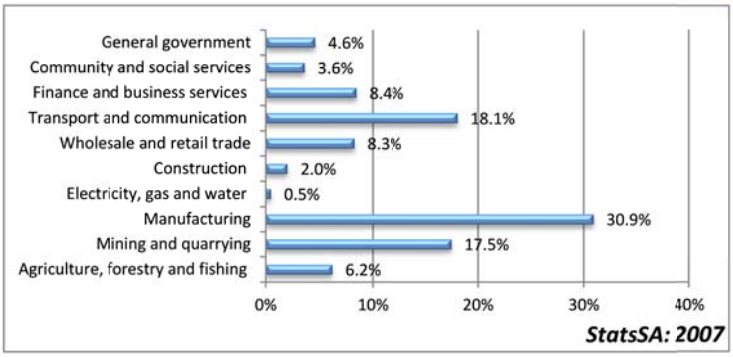
## Study Area 1:

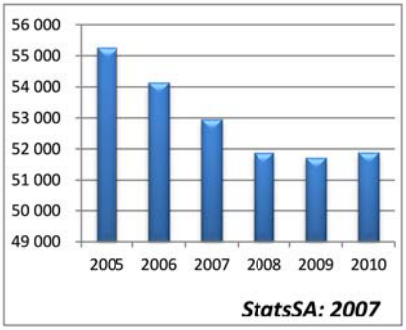
## Delmas

Delmas is situated in the Victor Khanye Local Municipality within the Nkangala District Municipal jurisdiction. Delmas is a small farming town, serving a community of farmers and miners from the surrounding areas. The regional location of Delmas is illustrated in the figure to the right. Delmas is located on the far western side of Mpumalanga, and borders Gauteng on the western side. Delmas lies between Witbank and Springs and close to the N12. The R50 between Pretoria and industrial and mining areas in Mpumalanga runs through Delmas, resulting in a large volume of passerby traffic (mostly freight) in the town.




The graph below indicates that the major contributors of the economy are the manufacturing and the transport and communication sectors. Mining activities are currently concentrated on coal and silica and approximately a million metric ton of coal and 2 million metric ton of silica are mined annually in the municipality. The unemployment rate of Delmas is 24.9%, slightly higher than the national average of 24.8% (Statistics South Africa, 2007). The greater Delmas economy represents a reasonably strong, sustainable and diversified economy. Agriculture, mining and services are the major contributors to the local economy and provide formal employment opportunities.



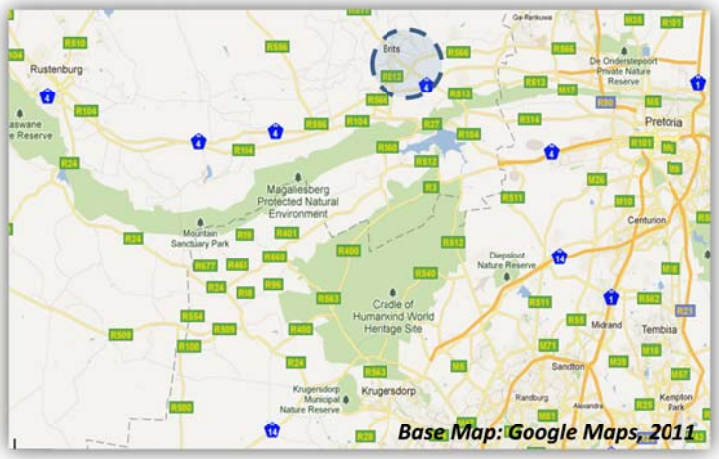




The total population of the Delmas Local Municipality is approximately 50,455, which amounts to 4.1% of the total Nkangala District Municipality population and 1.3% of the Mpumalanga population (Statistics South Africa, 2007). The male population constitutes 49% and the female population 51% of the total population. Fifty four present of the population is between the ages of 0 and 24 years (lower than the provincial and national average) (Statistics South Africa, 2007).

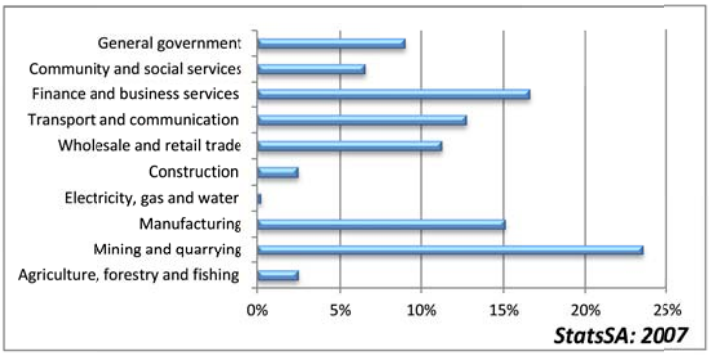
**Study Area 2:**

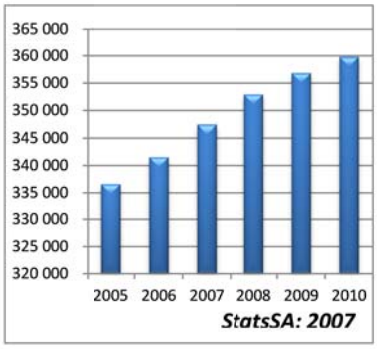
**Brits**

Brits is situated in the Madibeng Local Municipality within the North West Province. Brits is situated on the far eastern side of the North West Province, close to Pretoria. The map to the right graphically illustrates the location of Birts within the context of the province. The N4 is the backbone of the Maputo-Walvisbay corridor is located just south of Brits, a major route connecting Gauteng to Rustenburg to the West and Mbombela to the east. through Delmas, resulting in a large volume of passerby traffic (mostly freight) in the town.




The Municipal area is characterised by a diverse economy, including strong agriculture, mining, manufacturing and tourism sectors. The figure below indicates the sectorial distribution of the study area. The area is the world's third largest chrome producer and includes the richest Platinum Group Metals Reserve (Statistics South Africa, 2007). The major contributors of the economy are the mining and quarrying sector and financial and business services. The unemployment rate of Madibeng is 26%, higher than the national average of 24.8%.



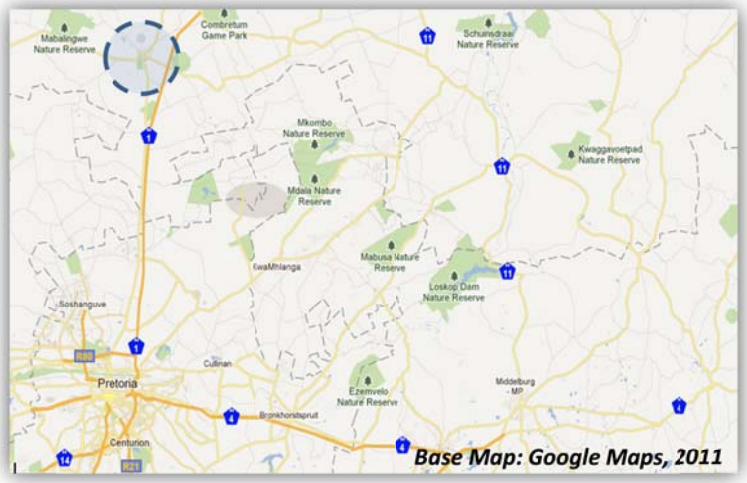




The population of Madibeng have grown at the average rate of 1.3% per annum in the given period (Statistics South Africa, 2007). The population and growth are graphically illustrated in the figure to the left. The population growth is slightly higher than the national population growth of 1.1% per annum. The male population contributes 51% and the female population 49%. Setswana is the home language of 53% of the area (Statistics South Africa, 2007)

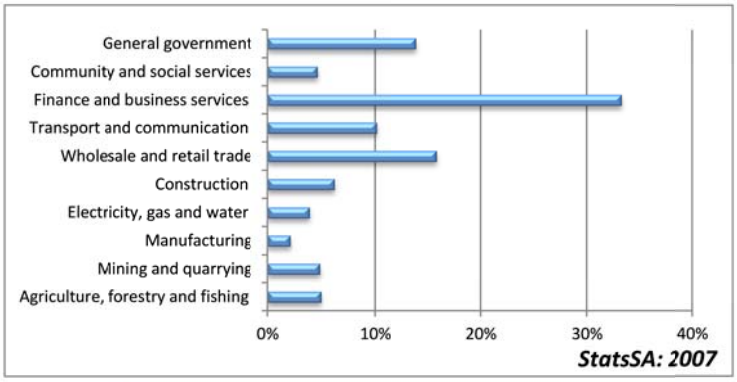
**Study Area 3:**

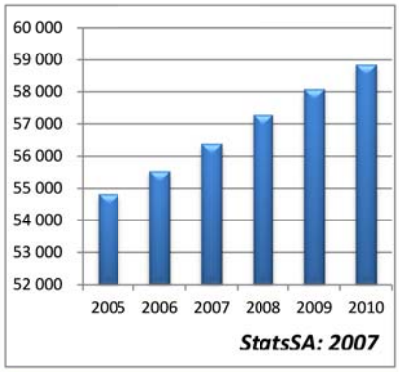
**Bela- Bela**

Bela-Bela is located in the Waterberg District in the Limpopo Province of South Africa. It lies off the N1 road between Pretoria and Polokwane. The regional location of Bela-Bela is illustrated in the figure to the right. Bela-Bela is approximately 110 km fromNorth from Pretoria and 170km south from Polokwane.




According to the 2007 Census, the total population of the Local Municipality is approximately 55,844 (Statistics South Africa, 2007). The population of Madibeng has a positive population growth rate. The population has grown at an average rate of 1.4% per annum. The population growth is higher than the national population growth of 1.1% per annum and the highest in the study area (Statistics South Africa, 2007).




Bela-Bela Municipality is a significant contributor to the economy of the district due to its location and its role in the regional economy (Statistics South Africa, 2007). The major contributors of the economy are financial and business services and wholesale and retail trade. The unemployment rate of Bela-Bela is 24%, higher than the national average of 24.8% (Statistics South Africa, 2007).

# Chapter 2: Empirical Findings

***"To be, or not to be: that is the question."***

***--William Shakespeare (1750)***

## 1. Introduction

The following chapter presents an overview of the key research findings in terms of the empirical fieldwork of the dissertation. The study set out to determine the relationship between a set of proxy indicators and the economy and provided valuable insight into this relationship. The chapter is structured in terms of the proxy indicators tested in the empirical fieldwork and each indicator is further discussed according to the results pertaining to each study area.

The following graphical presentation is used as a concisely in term of the interviewees overall belief in terms of the relationship between the prosy indicator and the economy:

| | |
|---|---|
| ✘ | : Indicator is not recommended by the interviewees to be used as a proxy indicator. |
| - | : Indicator can provide valuable information about the local economy, but should be used with caution. |
| ✓ | : Indicator is recommended by the interviewee to be used as a proxy indicator. |

## 2. Middle Class Residential Market

The following subsection provides the research findings of the empirical study conducted to test the use of middle class residential housing as a proxy indicator of the economy. The empirical study consisted of five interviews conducted with real estate agents in the study areas, one in Delmas, two in Brits and two in Bela-Bela. Real estate agents interviewed included agents from *Remax, Seeff and Pam Golding.* The results of the interviews are described according to each study area in the following subsection.

## 2.1. Delmas

Although there are a number of estate agents that sell properties in Delmas, the offices of only one real estate agency is located in Delmas. According to the local knowledge of the agent, the sales of middle class residential properties are influenced by economic cycles. Although the sales are influenced by the economy, the number of residential units sold has remained relatively low even though the economy has grown at a steady rate for more than a year.

The respondent argued that even though the recession had a negative impact on the number of residential properties sold, the policy of banks with regards to the registration of new residential housing bonds have made a far greater impact on the market. The number of units sold does follow similar trends as the economy, but have taken longer to move out of the recession, as the number of houses sold is still not as high as it used to be before the recession.

The respondent felt that although the number of residential properties sold can be a good indicator for the economy, care should be taken in the application as a proxy indicator because the number of houses sold is limited in a small town; it is possible that outliers can influence the results.

## 2.2. Brits

According to both the real estate agents interviewed in Brits, the sales of middle class residential properties are influenced by economic cycles. If the economy is growing, a greater number of houses are sold compared to the number of houses that are sold in times of economic stagnation and recession.

The first interviewee argued the recession had a detrimental effect on sales, but that the new credit act had a much larger influence. In response to the credit act banks are reluctant to approve new house bonds and subsequently the impact of the new credit act had a major impact on the number of residential properties sold. The first interviewee was of the opinion that there are too many externalities that have an impact on the number of residential properties sold, and that is subsequently should not be used as a proxy indicator for the economy.

The second interviewee noted that economic recessions not only have an impact on the number of residential properties sold, but also on the average price of residential properties. The real estate agent was of the opinion that the number of residential units sold is a good indication of the economy.

## 2.3. Bela-Bela

The interviewees state that in their experience, the economy has a major impact on the sales of middle class residential properties in Bela-Bela. According to the interviewees, the recession had a major impact on the sales of middle class residential properties, and although the economy have in many instances recovered, the sales of middle class residential properties are still low, and have not recovered to the extent that was expected.

The first interviewee argued that when economic growth is declining, the sales of middle class residential properties stagnate but the market for residential housing stock simultaneously increases. He further argued that when the sales of middle class residential properties declines, the average market price per unit is manipulated downward. Therefore as the demand for residential units declines, prices fall.

The interviewees were of the opinion that the sales of middle class residential properties can be a good indicator of the economy. They argued that although most economic sectors and the largest part of South Africa experience the impact of the economy, it is especially the housing markets in the rural areas that are impacted negatively by an economic recession. They further argued that the sale of residential property is a good indication of the number of people that migrates to an area because of the availability of new employment opportunities.

## 2.4. Conclusion

Of the five interviews, three interviewees expressed that in their experience of the local economy, the number of middle class residential units sold is a good indicator, and two were of the opinion that it could be used if certain criteria is met and the indicator is used with caution.

Table 2.1 below gives an overview of the findings in terms of the relationship between the sales of middle class residential properties and the economy.

**Table 2.1: Empirical Findings: Number of Middle Class Residential Properties sold**

| Proxy Indicator | Delmas | Brits | Bela-Bela | Results | Conclusion |
|---|---|---|---|---|---|
| Number of Middle Class Residential Properties sold | - | -✓ | ✓✓ | 3/5 | - |

According to the local knowledge of the interviewees, the sales of middle class residential properties are influenced by economic cycles. If the economy is growing, a greater number of residential properties are sold compared to the number of houses that are sold in times of economic stagnation and recession. The following key trends with regards to the sale of residential units were recorded in the interviews:

- When the economy is in times of economic stagnation and recession, investors with capital manipulate the prices of the properties downwards, thus forcing the **price of residential** properties downwards; and cost-effective
- When the economy is in times of economic stagnation and depression, there is a rise in the **demand for residential rental stock**.

According to the interviewees, the sales of middle class residential properties was hit extremely hard by the recession, and although the economy have in many instances recovered, the sales of middle class residential properties are still low, and have not recovered to the extent that was expected. It is the perception of the interviewees that the number of residential units sold in their local area does represent the economy effectively and is definitely a good indicator of the economy.

One respondent were or the opinion that although the number of residential properties sold can be a good indicator for the economy, care should be taken in the application as a proxy indicator because the number of houses sold is limited in a small town it is possible that outliers can influence the results

The majority of the interviewees were thus of the opinion that the sales of middle class residential properties can be a good indicator of the economy. They further argued that residential properties are

a good indication of the number of people that migrates to an area because of the availability of new employment opportunities.

## 3. Growth in Residential Building Activity

The following subsection provides the research findings of the empirical study conducted to test the use of the growth in residential building activity as a proxy indicator of the economy. The empirical study consisted of five interviews conducted with managers of companies that sell construction material in the study areas, one in Delmas, two in Brits and two in Bela-Bela. Companies interviewed that sell construction material included *Cash-Build, Build-It and Mica*. The results of the interviews are described according to each study area in the following subsection.

### 3.1. Delmas

The interview was conducted with the only hardware and construction goods store in Delmas, although it is possible that a number of residents and developers may use supplies from the nearby towns like Springs and Benoni. According to the manager, the residential construction sector is definitely influenced by economic fluctuations. The business experienced the influence of the recession especially hard, as there was very few new residential construction projects started since 2007. The mines in the vicinity of Delmas did construct a number of residential units for the workers of the mine, but they used construction material directly from the stockist and not from the local businesses. The interviewee argued that although residential building activity can provide important insight into the economy, there are a number of externalities that can influence the construction sector, for example the units developed by the mines.

### 3.2. Brits

The managers of the businesses that sell hardware and construction good in Brits state that in their experience, the economy has a major impact on the residential construction sector in Brits. According to the interviewees, the residential construction sector is an accurate indicator of the economy, as construction goes hand-in-hand with economic and business development.

The residential construction sector was hit extremely hard by the recession, as a result of a number of occurrences. Construction material and labour cost increased yearly while residential property prices declined. This resulted in a scenario where it is not feasible for consumers to develop a new house, as the prices of existing homes are much lower. But despite the fact the recession had a major impact on the residential construction sector, the sales of construction material never dropped below 0%.

A major effect on the residential construction sector in Brits during the recession, that helped the sector to survive, was a number of government housing developments in the municipality, where a number of local contractors were used to develop portions of the houses. In conclusion, both the interviewees believed in their experience that the growth in residential building activity was an accurate indicator of the economy.

### 3.3. Bela-Bela

According to the first manager interviewed, the residential construction sector is influenced by economic cycles. He argued that the economy of Bela-Bela is largely influenced by the number of tourists that visit the area on weekends and school holidays. In times of economic stagnation and depression, the demand for tourist accommodation (a large part of the residential construction activity in Bela-Bela) declines substantially, and accordingly the growth in the residential construction sector decreases. He further argued that because there have been yearly inflated adjustments to the construction costs per $m^2$, while the house prices have declined/stabilised in the same period, it is much more cost-effective for consumers to purchase a completed home than to construct a new residential house.

The second interviewee argued that the residential construction sector was not heavily influenced by the economy and that sales remain relatively consistent over time. He stated that the sales of the store grew at an average of 19% (year-on-year), and that residential construction sector is not a good indicator of the economy.

The first interviewee thus argued that the residential construction sector is influenced by the economy, and the second interviewee argued that the residential construction sector is not heavily influenced by the economy.

## 3.4. Conclusion

Of the five interviews, three interviewees expressed that in their experience of the local economy, the residential construction sector is a good indicator, one interviewee were of the opinion that it could be used if certain criteria is met and the indicator is used with caution, and one interviewee were of the opinion that it is not a good indicator of the economy.

Table 2.2 below provides an overview of the research findings in terms of the relationship between the residential construction sector and the economy.

**Table 2.2: Empirical Findings: Growth in Residential Building Activity**

| Proxy Indicator | Delmas | Brits | Bela-Bela | Results | Conclusion |
|---|---|---|---|---|---|
| Growth in Residential Building Activity | - | ✓✓ | ×✓ | 3/5 | - |

According to the interviewees, the residential construction sector is definitely influenced by economic fluctuations. The interviewees stated that the construction sector is one of the major sectors in the economy in terms of GDP production and employment, and that a change in almost any other sector will undeniably have an effect on the construction sector.

The following key trends with regards to growth in residential building activity were recorded in the interviews:

- When the economy is in a recession, the construction sector is extremely **price sensitive**. For example, even 1c on the price of a packet of cement will determine where a builder would make his purchases;
- Builders are more likely to compromise on the **quality of the products** and make use of cheaper suppliers and products in times of economic depression; and
- The **type of residential building activity** differs. In a recession, building activity is mostly centred on vital maintenance as opposed to the construction of new homes.

The residential construction sector was hit extremely hard by the recession, as the construction material and labour cost increased yearly, residential property prices declined, that is was not feasible for consumers to develop a new house. It should be noted that there can be a number of external factors that influence the residential development sector, for example a government housing development, or a steady decline in tourism in the area. It is also important to note that the residential construction market is still under pressure as the annual increases in construction costs exceeded the annual growth of house prices.

## 4. Growth in Non-residential Building activity

The following subsection provides the research findings of the empirical study conducted to test the use of the growth in non-residential building activity as a proxy indicator of the economy. The empirical study consisted of five interviews conducted with managers of business that sell construction material in the study areas, one in Delmas, two in Brits and two in Bela-Bela. Business interviewed that sell construction material included *Cash-Build, Build-It and Mica*. The results of the interviews are described according to each study area in the following subsection.

### 4.1. Delmas

According to the interviewee, although the construction of non-residential developments is influenced by economic fluctuations, it is not affected as much as the residential construction. The majority of non-residential developments are constructed by large construction companies that do not make use of the local stores to purchase products.

The Delmas Mall, the largest retail facility in Delmas, was constructed during the recession. As a result of this the recession did not have such a negative effect on the non-residential construction sector figures (although the developer did source a large amount of materials from the larger metros in the vicinity). The interviewee were accordingly of the impression that non-residential construction activity is not an accurate indicator of the local economy.

## 4.2. Brits

According to the first interviewee, the economy has a major impact on construction of non-residential developments in Brits and is an accurate indicator of the economy. However, the second interviewee experienced that even though the impact of economic fluctuations had a major effect on residential developments, the impact was not as major on non-residential developments.

He argued that the non-residential property market develops fewer units per annum (not an indication of the size), and that the non-residential market is more stable. He argued that non-residential developments are in general larger in size, higher in capital investment and longer in terms of construction and operation. Thus if a mall takes three years to develop, and a recession hits the economy by year one, is very possible that the recession will be over by the time the development is finished.

## 4.3. Bela-Bela

According to the interviewees, although the construction of non-residential developments is influenced by economic fluctuations, it is not affected as much as the residential construction. The interviewees were of the impression that because tourist accommodation is such a large contributor the residential construction sector, it is a lot more likely to be influenced by national and local economic fluctuations.

The interviewees argued that the supply of retail and office space in Bela-Bela have been met demand for more than the past five years, and thus there have not been many new non-residential developments. The interviewees were thus of the impression that although it can give some insight into the local economy, the growth in non-residential construction activity is not a good indicator of the economy.

## 4.4. Conclusion

Of the five interviews, one interviewee expressed that in his experience of the local economy, non-residential construction activity is a good indicator, two interviewees were of the opinion that it could

be used, if certain criteria is met and the indicator is used with caution and two were of the opinion that is cannot be used as a proxy indicator.

Table 2.3 below provides an overview of the research findings in terms of the relationship between the construction of non-residential developments and the economy.

**Table 2.3: Empirical Findings: Growth in Non-Residential Building Activity**

| Proxy Indicator | Delmas | Brits | Bela-Bela | Results | Conclusion |
|---|---|---|---|---|---|
| Growth in Non-Residential Building Activity | × | -✓ | ×- | 1/5 | ✘ |

According to the interviewees, although the construction of non-residential developments is influenced by economic fluctuations, the growth in non-residential building activity is closely related to the growth of residential building activity the non-residential building activity is more stable in economic fluctuations. They argued that because the majority of non-residential developments are constructed by large construction companies that do not make use of the local stores to purchase products.

The respondents further argued that the fall in non-residential building activity was not as major as the fall in residential building activity in the global financial downturn. The interviewees argued that non-residential developments are in more capital and time intensive and that a possible recession can possible be over by the time a recession are over.

## 5. Submission of Residential Building Plans

The following subsection provides the research findings of the empirical study conducted to test the use of the submission of residential building plans as a proxy indicator of the economy. The empirical study consisted of two interviews conducted with municipal officials in the study areas, one in Delmas and one in Brits. The results of the interviews are described according to each study area in the following subsection.

## 5.1. Delmas

According to the local knowledge of the official, the economy does influence the number of residential building plans submitted. When the economy is growing, there is more residential building plans submitted compared to when the economy is stagnating or in a recession. There were less residential building plans submitted during the recession, although the number of residential building plans submitted as part of township establishments, or residential mine developments stayed consistent.

The official was of the impression that the number of residential building plans can provide insight into the local economy, but because a number of residential building plans submitted do not get constructed, it is likely that there are other indicators that portray the economy more accurately.

## 5.2. Brits

According to the local knowledge of the official in Brits, the economy does influence the number of residential building plans submitted. When the economy is growing, there is more residential building plans submitted compared to when the economy is stagnating or in a recession. According to the official, more additions are submitted in times of economic stagnation and depression, and less residential, commercial and business. The respondent further stated that the submission took long to recover after the economy showed signs of growth. The official was of the impression that the number of residential building could be a good indicator of the economy, but that she is unsure of the accuracy of the indicator.

## 5.3. Bela-Bela

Even after a substantial amount of time was spend to locate any official that was able to give some insight into the number of building plans approved in Bela-Bela, no official could indicate a person or office that could assist in the study. Therefore it was unfortunately not possible to conduct an interview with a municipal official.

## 5.4. Conclusion

Both the interviewees expressed that in their experience of the local economy, the submission of residential building plans can provide insight into the economy, but that they could not tell for sure.

Table 2.4 below provides an overview of the research findings in terms of the relationship between the number of residential building plans and the economy.

**Table 2.4: Empirical Findings: Submission of Residential Building Plans**

| Proxy Indicator | Delmas | Brits | Bela-Bela | Results | Conclusion |
|---|---|---|---|---|---|
| Submission of Residential Building Plans | - | - | | 0/2 | ✘ |

According to the local knowledge of the officials interviewed, the economy does influence the number of residential building plans submitted. When the economy is growing, there is more residential building plans submitted compared to when the economy is stagnating or in a recession. The municipal officials interviewed were of the opinion that the number of building plans submitted demonstrations similar trends than that of the economy, especially in times of rapid economic growth, but not necessarily in times of economic stagnation and recession.

The official was of the impression that the number of residential building plans can provide insight into the local economy, but because a number of residential building plans submitted do not get constructed, it is likely that there are other indicators that portray the economy more accurately

## 6. Growth in Retail Sales: Durable Goods

The following subsection provides the research findings of the empirical study conducted to test the use of the growth in the retail sales of durable goods as a proxy indicator of the economy. The empirical study consisted of six interviews conducted with managers of durable retail stores in the study areas, two in Delmas, two in Brits and two in Bela-Bela. Durable retail stores include *Lewis, Bears and OK*

*Furniture.* The results of the interviews are described according to each study area in the following subsection.

## 6.1. Delmas

According to the first manager interviewed, the sales of durable goods are influenced by economic cycles, as consumers purchase less products in times of economic stagnation of depression. The second interviewee, the manager of a competitor durable goods store in close proximity to the first store, argued that the business sales were not heavily influenced by the economy and that sales remain relatively consistent over time. He stated that the sales of the store was never less than 1% quarter-to-quarter, and that the sale of durable goods are not a good indicator of the economy.

The first interviewee argued that during the recession, sales went down, and that more consumers tend to buy goods on credit compared to buying cash. Even though the first interviewee was of the impression that the sales of durable goods are influenced by the economy, he is not of the impression that the sales of durable goods are a good indicator of the economy. He argued that the town is more influenced by mining activities than economic activities. It a new mine is opened in the area, sales rise as a result of the influx of new workers, but if a mine closes in the vicinity of the area, the general future prospects are lower, and that sales tend to lower.

## 6.2. Brits

The managers interviewed argued that in their experience the sales of durable goods are heavily influenced by economic cycles in Brits. The first interviewee stated that in his experience the durable retail goods sector was severely hit by the recession and that people think twice before purchasing goods in times of economic stagnation.

The interviewees further argued that the economy not only influences the total sales of durable retail goods at the end of the month, but also consumer trends in terms of durable retail purchases. In times of economic stagnation and recession, more consumers buy goods on credit as opposed to times of economic growth and consumers tend to prefer lower quality and less expensive goods. One manager

stated that as much as 97% of the monthly sales in times of economic recession and stagnation are sold on credit.

The managers concluded that durable retrial sales are a good indicator of the local economy and can be used as a proxy indicator of the economy.

## 6.3. Bela-Bela

Both managers interviewed stated that in their experience the sales of durable goods are heavily influenced by economic cycles. When the economy is growing, the sales of durable retail goods at the end of the month exceed the sales in times of economic stagnation and depression. They argued that the economy of Bela-Bela is largely influenced by the number of tourists that visit the area on weekends and school holidays. In times of economic stagnation and depression, there are substantially less tourists that visit the area, and subsequently the demand for durable retail goods decline.

Economic fluctuations also influence consumer behaviour in terms of durable goods in a number of ways. The first interviewee stated that in his experience most of his sales are attributed to tourists that have holiday homes on nearby game farms, and when the economy is in a recession, there are substantially less homes build and subsequently the demand for durable retail goods decline. Interviewee two further argued that the economy does not only influences the total sales of durable retail goods at the end of the month, but in times of economic stagnation and recession, more consumers buy goods on credit as opposed to cash. Consumers also tend to prefer lower quality and less expensive goods.

The managers concluded that in their opinion durable retrial sales are a good indicator of the local economy and can be used as a proxy indicator of the economy.

## 6.4. Conclusion

Of the six interviews, four interviewees expressed that in their experience of the local economy, durable retail sales are a good indicator of the economy, one interviewee were of the opinion that it could be

used, if certain criteria is met and the indicator is used with caution and one interviewee were of the impression that durable retrial sales cannot be used as an indicator of the economy.

Table 2.5 below gives an overview of the findings in terms of the relationship between the sale of durable retail goods and the economy.

**Table 2.5: Empirical Findings: Retail Sales of Durable Goods**

| Proxy Indicator | Delmas | Brits | Bela-Bela | Results | Conclusion |
|---|---|---|---|---|---|
| Retail Sales of Durable Goods | -✖ | ✓✓ | ✓✓ | 4/6 | ✓ |

The interviewees are of the opinion that the growth in durable retail sales in their local area does represent the economy graphically illustrated in the interview and that the proxy is a good indicator of the economy. According to the interviewees the global financial downturn had a major effect on the sales but even though the recession decreased the monthly sales, the sales did not decrease as negatively as the local economy.

The interviewees further argued that the economy not only influences the total sales of durable retail goods at the end of the month, but also consumer trends in terms of durable retail purchases. The following key trends were recorded in the interviews:

- In times of economic stagnation and recession, more consumers **buy durable goods on credit** as opposed to times of economic growth and consumers tend to prefer lower quality and less expensive goods. One respondent indicated that if the economy is growing steadily, approximately 80% of the sales of durable goods are credit based, and 20% is cash based. But if the economy is in a recession, approximately 98% is of the durable goods sales are credit based and 25% are cash based;
- In times of economic growth, individuals have a positive outlook on the future of the economy, and are willing to **buy larger quantities** of products because they are of the opinion that they will be able to pay back the loan amount in future. Customers are more willing to buy large quantities of goods in times when the outlook of the economy is higher,

for example, a customer will buy a TV, leather couches and a coffee table, but in recession he will only buy the TV;

- The **durability of furniture has decreased**. Previously someone would buy a dining room set, and it would last him a lifetime, but because the quality of the products have decreased so heavily over time, customers have to buy goods on a regular, almost annual, basis; and
- In times of economic downturn, customers are more likely to buy cheaper and **less durable products** compared to expensive and high quality products.

It was however noted that there can be external factors that can have a major effect on the amount of durable goods sold. In Brits and Delmas, where mining is a major contributor to the economy and to the local employment, the opening and closing of a mine has a major effect on the population dynamics of the area. In Bela-Bela most of his sales are attributed to tourists, any changes in the tourism sector have a substantial effect on the sale of durable retail goods.

## 7. Business Profit in Retail sales: Durable Goods

The following subsection provides the research findings of the empirical study conducted to test the use of business profit in the retail sector in terms of durable goods as a proxy indicator of the economy. The empirical study consisted of six interviews conducted with managers of durable retail stores in the study areas, two in Delmas, two in Brits and two in Bela-Bela. Durable retail stores include *Lewis, Bears and OK Furniture.* The results of the interviews are described according to each study area in the following subsection.

### 7.1. Delmas

The interviewees argued that business profit, as with retail sales, are influenced more by the mining activity in the vicinity of Delmas than by the economy. The profitability does not really change over time in the long run. If the sale in a specific month is below what is expected, the store can run a promotion on a number of products (lower profit margin) but will raise the price of other products (higher profit margin). Even if the if the business lowers its profit margin, the total profit at the end of the month remains consistent because there were more sales.

The interviewees argued that the sales (and in turn the profitability) of durable retail goods are influenced by a number of externalities including the petrol price, inflation, food prices and the performance of specific sectors like the mining and agriculture sector. But at the end of the day, people will always need furniture, and if the store is managed correctly, there will always be sales and profit.

### 7.2. Brits

The manager interviewees argued that in their experience the economy has an impact on the profitability of durable retail sales in Brits. One interviewee argued that profitability in business is a game. Any external influence on your business impacts the profitability even the opening of a new store or the development of a regional mall out of town. In times of such an external influence, it is up to the manager to make a strategic decision, to possibly lower the profit margin to attract potential consumers to the store. At times the manager will decide to lower profit margins, and at other times the manager will rather lower sales than lower the profit margin. But in general, profit margins are higher in times of economic growth compared to times of economic stagnation and recession.

### 7.3. Bela-Bela

The interviewees argued that in their experience the economy has an impact on the profitability of durable retail sales in Brits. Although the profitability of durable retail goods are influenced by a number of externalities, an economic recession will have an impact on the demand for durable retail goods and in turn on the profitability of durable retail goods. The interviewees argued that although profit margins are generally higher in times of economic growth, it is as a result of the demand for retail goods, and accordingly the sales of retail goods are a more accurate indicator of the economy.

### 7.4. Conclusion

Of the six interviews, two interviewees expressed that in their experience of the local economy, the profitability of durable retrial sales are a good indicator of the economy, two interviewees were of the opinion that it could be used, if certain criteria is met and the indicator is used with caution and two interviewee were of the impression that the profitability of durable retrial sales cannot be used as an indicator of the economy.

Table 2.6 below gives an overview of the findings in terms of the relationship between the profitability of durable retail sales and the economy.

**Table 2.6: Empirical Findings: Business Profit of Durable Goods Retailers**

| Proxy Indicator | Delmas | Brits | Bela-Bela | Results | Conclusion |
|---|---|---|---|---|---|
| Business Profit of Durable Goods Retailers | ×× | ✓- | ✓- | 2/6 | - |

The interviewees argued that in their experience the economy has an impact on the profitability of durable retail sales. Although in general profit margins are higher in times of economic growth compared to times of economic stagnation and recession, the loss in profitability is attributed to the decline in demand for durable retail goods.

Although the profitability of durable retail goods are influenced by a number of externalities, an economic recession will have an impact on the demand for durable retail goods and in turn on the profitability of durable retail goods. The interviewees argued that although profit margins are generally higher in times of economic growth, it is as a result of the demand for retail goods, and accordingly the sales of retail goods are a more accurate indicator of the economy.

## 8. Growth in Hardware Sales

The following subsection provides the research findings of the empirical study conducted to test the use of the growth in the hardware sales as a proxy indicator of the economy. The empirical study consisted of five interviews conducted with managers of hardware retail stores in the study areas, one in Delmas, two in Brits and two in Bela-Bela. Interviews were conducted with five local hardware store managers including *Mica, Build it* and local hardware stores. The results of the interviews are described according to each study area in the following subsection.

## 8.1. Delmas

The manager of the hardware store argued that in his experience, the economy has a major impact on the sales of hardware goods in Delmas. Not only does the economy influence the total sales of hardware goods at the end of the month, but also the consumer trends in terms of hardware retail purchases.

In times of economic stagnation and recession, consumers buy smaller quantities of goods than consumers do in a stable growing economy (four nails the consumer needs as opposed to a bag of ten nails). Consumers also buy products focussed on maintenance (silicone and duck-tape) as opposed to cosmetic products (new shower heads). Lastly consumers tend to be more price sensitive in times of economic recession and purchase lower quality and less expensive goods compared to higher quality more expensive goods.

The manager concluded that in his experience of the local economy, hardware sales are a good indicator of the local economy and can be used as a proxy indicator of the economy.

## 8.2. Brits

According to the local knowledge of the managers, the sales of hardware goods are heavily influenced by economic cycles. One interviewee argued that in times of economic depression, general maintenance and upgrading of their homes are one of the first aspects of consumer spending to be influenced. The interviewees argued that the sales of hardware goods follow similar trends as the economy, and that their businesses suffered during the economic recession. The respondent concluded that the sales of hardware goods can be a good indicator for the economy, as the sale of hardware goods are heavily influenced by economic fluctuations.

## 8.3. Bela-Bela

The interviewees argued that in their experience the economy has a major impact on the sales of hardware goods. In times of economic stagnation and recession, consumers buy smaller quantities of hardware retail goods compared to times of economic growth. The first interviewee stated that in his experience most of his sales are attributed to tourists that have holiday homes on nearby game farms,

and when the economy is in a recession, the tourists visit Bela-Bela less often and in turn buy fewer goods. The interviewees argued that they felt a major impact of the recession on their business activity and that in their opinion the sales of hardware goods are a good indicator of the economy.

## 8.4. Conclusion

All five interviewees expressed that in their experience of the local economy, the sales of hardware goods is a good indicator of the economy.

Table 2.7 below gives an overview of the findings in terms of the relationship between the growth in hardware sales and the economy.

**Table 2.7: Empirical Findings: Volume of Sales of Hardware Retailers**

| Proxy Indicator | Delmas | Brits | Bela-Bela | Results | Conclusion |
|---|---|---|---|---|---|
| Volume of Sales of Hardware Retailers | ✓ | ✓✓ | ✓✓ | 5/5 | ✓ |

The interviewees argued that in their experience, the economy has a major impact on the sales of hardware goods in the study areas. If the economy is moving into a recession, or shows signs of stagnation, the growth in hardware sales decreases. If the economy is stagnating, people have less money to spend on homes and building and the growth in hardware sales stagnates with the economy. Not only does the economy influence the total sales of hardware goods at the end of the month, but also the consumer trends in terms of hardware purchases:

- In times of economic stagnation and recession, consumers buy **smaller quantities** of goods compared to times of economic growth. For example, a customer will buy one or two nails when the economy is in a recession, but when the economy is growing, the customer will buy a bag of nails;
- Consumers are more **price sensitive** in times of economic recession and stagnation and purchase lower quality and less expensive goods compared to higher quality more expensive goods; and

- Consumers also buy products **focussed on maintenance** (silicone and duck-tape) as opposed to cosmetic products (new shower heads).

The interviewees experienced that the global financial downturn had a major negative effect on the growth in hardware sales. The interviewees were of the impression that the growth in hardware sales are a good indicator of the economy, as the growth in sales are closely linked to the economy and therefore follows similar trends.

## 9. Business Profit in Hardware Sector

The following subsection provides the research findings of the empirical study conducted to test the use of the profitability of hardware retailers as a proxy indicator of the economy. The empirical study consisted of five interviews conducted with managers of hardware retail stores in the study areas, one in Delmas, two in Brits and two in Bela-Bela. Interviews were conducted with five local hardware store managers including *Mica, Build it* and local hardware stores. The results of the interviews are described according to each study area in the following subsection.

### 9.1. Delmas

The manager of the hardware store argued that in his experience, the economy has a major impact on the profitability of hardware retailers in Delmas. As discussed, the economy does not only influence the total sales of hardware goods at the end of the month, but also the consumer trends in terms of hardware purchases. In turn the total sales and consumer behaviour have an impact on the profitability of the business.

In times of economic stagnation and recession, consumers buy smaller quantities of goods and accordingly the profit made out of sales are lower than in times of economic growth. Consumers also tend to purchase lower quality and less expensive goods in times of economic stagnation and recession and cheaper products have a lower profit margin than more expensive products. The manager was thus of the opinion that the profitability of hardware retailers as well as the sale of hardware goods are a good indicator of the local economy.

## 9.2. Brits

The managers of hardware retailers in Brits are of the opinion that the profitability of hardware stores is influenced by economic cycles. The managers argued that all businesses lose profit in times when the economy is struggling, not only the hardware retail sector. Form the stance, a business that experience a decline in sales will experience a loss in profit, as all retail businesses depend on the sale of retail items. The business have a decision to lower the prices of specific items (lower profitability per item), in the hope that the sales would increase, or hope that they will make enough sales to sustain the business through the recession. The interviewees argued that lowering the profit margin or having fewer sales will both lower the profitability of the business. The interviewees stated that the profitability of hardware goods could be a good indicator of the state of the local economy, but that the sales of hardware goods will provide more accurately results.

## 9.3. Bela-Bela

According to the managers the profitability of hardware stores is influenced by economic cycles but not to the same extent as the sales of hardware goods. In times of economic stagnation and recession, consumers buy smaller quantities of goods and accordingly the profit made out of sales are lower than in times of economic growth. As in Brits, the interviewees argued that by either lowering the profit margin or making fewer sales, the profitability of the business will be negatively influenced.

## 9.4. Conclusion

Of the five interviews, three interviewees expressed that in their experience of the local economy, the profitability of the hardware sector is a good indicator of the economy, and two expressed that it could be used if certain criteria is met and the indicator is used with caution.

Table 2.8 below gives an overview of the findings in terms of the relationship between the profitability of hardware goods and the economy.

**Table 2.8: Empirical Findings: Profitability of Hardware Retailers**

| Proxy Indicator | Delmas | Brits | Bela-Bela | Results | Conclusion |
|---|---|---|---|---|---|
| Profitability of Hardware Retailers | ✓ | -✓ | -✓ | 3/5 | - |

The managers of the hardware stores interviewed argued that in their experience, the profitability of hardware stores is influenced by economic cycles but not to the same extent as the sales of hardware goods. In times of economic stagnation and recession, consumers buy smaller quantities of goods and accordingly the profit made out of sales are lower than in times of economic growth. The interviewees argued that by either lowering the profit margin or having fewer sales, the profitability of the business will be negatively influenced.

- In times of economic stagnation and recession, consumers buy smaller quantities of goods and accordingly the profit made out of sales are lower than in times of economic growth; and
- Consumers also tend to purchase lower quality and less expensive goods in times of economic stagnation and recession and cheaper products have a lower profit margin than more expensive products

The interviewees stated that the profitability of hardware goods could be a good indicator of the economy, but that the sales of hardware goods will provide more accurately results.

## 10. Growth in the sales of Spare Parts

The following subsection provides the research findings of the empirical study conducted to test the use of the volume of sales of spare parts for vehicles as a proxy indicator of the economy. The empirical study consisted of six interviews conducted with managers of spare part stores in the study areas, two in Delmas, two in Brits and two in Bela-Bela. Stores include in the interviews include *Midas, Auto Zone* and other local spare part stores. The results of the interviews are described according to each study area in the following subsection.

## 10.1. Delmas

The interviewees stated that they experience economic fluctuations in their businesses. When the economy is growing, the sales at the end of the month exceed the sales in times of economic stagnation and depression. But the economy also influences consumer trends in terms of spare part purchases.

In times of economic stagnation and recession, consumers purchase lower quality and less expensive imported goods compared to higher quality more well-known goods. Sales between 2005 and 2010 also suggest that in times of economic stagnation and recession consumers purchase goods for maintenance, compared to times of economic growth in which consumers purchase goods to increase performance in motor vehicles. In times of economic recession, the retailer is also forced to have more sales on products, than he would have in times of economic growth. The interviewees concluded that in their experience of the local economy, the volume of sales of spare parts for vehicles is a good indicator of the local economy.

## 10.2. Brits

According to the first interviewee, the economy has an impact on volume of sales of spare parts for vehicles in Brits and is an accurate indicator of the economy. However, the second interviewee experienced the opposite of the first interviewee, and argued that the sales of spare parts rise when the economy is moving into a recession, and declined when the economy is growing.

The first interviewee argued that although the business struggled in the recession, the business managed to make a profit every month and never showed signs of negative growth. He experienced that in times of economic stagnation and recession consumers purchase lower quality goods and the bulk of the sales are goods relating to maintenance or repair of motor cars, not cosmetic goods like seat covers.

The second interviewee argued that in times of economic stagnation and recession, consumers tend to repair their currents cars as opposed to purchasing new cars, or trading their cars for a newer model. This trend results in a rise in the sales of motor vehicle parts. The interviewee stated that although their profit margins remained consistent in the recession, the volume of sales increased substantially.

In conclusion, both interviewees were of the impression that the use of spare parts for motor vehicles can be used as an indicator of the economy.

## 10.3. Bela-Bela

According to the interviewees, the volume of sales of spare parts for vehicles is influenced by economic cycles. In times of economic stagnation and depression, the demand of spare parts for vehicles declines substantially and consumers change their behaviour in terms spare parts for vehicles.

The interviewees argued that because the sales of new motor vehicles are so heavily influenced by the economy, specific motor vehicles part are purchases more often. In times when the economy is declining, consumers purchase less expensive products compared to times of economic growth. Consumers also use more cash to purchase products and the products are focused on maintenance or to mend something that have broken compared to cosmetic and luxury items.

The managers of spare part retailers concluded that in their experience the sales in terms of spare parts are a good indicator of the economy.

## 10.4. Conclusion

Of the six interviews, al the interviewees expressed that in their experience of the local economy, the volume of sales of spare part for vehicles is a good indicator of the economy.

Table 2.9 below gives an overview of the findings in terms of the relationship between the demand of spare parts for vehicles and the economy.

**Table 2.9: Empirical Findings: Volume of Sales of Spare Parts for Vehicles**

| Proxy Indicator | Delmas | Brits | Bela-Bela | Results | Conclusion |
|---|---|---|---|---|---|
| The Volume of Sales of Spare Parts for Vehicles | ✓✓ | ✓✓ | ✓✓ | 6/6 | ✓ |

The interviewees experienced the impact of economic fluctuations on the demand of spare parts for vehicles. When the economy is growing, the sales at the end of the month exceed the sales in times of economic stagnation and depression. In times of economic stagnation and depression, the demand of spare parts for vehicles declines substantially and consumers change their behaviour in terms spare parts for vehicles.

The following key trends with regards to the growth in sales of spare parts were recorded in the interviews:

- The **type of products** purchased differs in times of economic growth and economic stagnation and recession. In times of economic growth customers purchase optional products, for example wax for a car or new car seats. However in times of economic stagnation, sales are focused on goods relating to maintenance or repair products that are mostly vital for the effective functioning of the vehicle like oil and other lubricants; and
- In times of economic stagnation and recession, consumers purchase **lower quality** and less expensive imported goods compared to higher quality more well-known goods.

As the spare parts business is mostly a cash business, the interviewees were of the impression that the growths in hardware sales are a good indicator of the economy.

## 11. Fuel Consumption and Demand

The following subsection provides the research findings of the empirical study conducted to test the use of fuel consumption as a proxy indicator of the economy. The empirical study consisted of six interviews conducted with managers of fuel in the study areas, two in Delmas, two in Brits and two in Bela-Bela. Interviews were conducted with six local fuel stores including Sasol, Engen and BP. The results of the interviews are described according to each study area in the following subsection.

### 11.1. Delmas

The fuel station managers interviewed were of the opinion that in their experience with Delmas, the economy has a major influence on the amount of fuel sold. When the economy is growing, consumers

have a positive future outlook and have money to purchase goods and consumables like petrol. In a rural setting, where agriculture plays a major part of the economy, the economy has an even greater impact on fuel sales, because modern agriculture is very dependable on fuel.

Even though the sale of fuel follow the same trend as economic cycles, at times when economic growth declines to below 0%, the fuel sales will not decline to a negative growth rate. In terms of consumer behaviour, consumers are prone to buy larger quantities of fuel at the end of the month in times of economic stagnation and depression, compared to consumers filling up more frequently when the economy is growing.

The interviewees argued that because fuel is such a vital element in a number of business activities, the quantity of fuel sold is a good indication of the local economy.

### 11.2. Brits

According to the first manager interviewed, the sales of durable goods are not influenced by economic cycles and that he cannot see the impact of the recession on the total volume of fuel sales. He argued that although there are a number of factors that influences the demand for petrol in the short-term (for example: consumers fill up their vehicles just before the petrol price rises, thus a steep increase in demand for a day or two), consumer behaviour always fall back to the known in a short period of time. He used the example that when the economy is in a recession, people may travel less or makes fewer trips in the beginning, but after a few days or weeks, they fall back to the old behaviour.

The second interviewee, experienced the opposite of the first interviewee and argued that the economy have a major effect on her business. She argued that consumers are buying larger quantities of fuel less often (especially at the end of the month) in times of economic stagnation and depression. The second interviewee stated that as fuel plays such a major part in most economic activities, the demand for fuel is a good indicator of the economy.

## 11.3. Bela-Bela

The fuel station managers interviewed expressed that in their experience, the economy has a major influence on the amount of fuel sold. When the economy is growing, consumers have a positive future outlook and have money to purchase goods and consumables like petrol. As the economy of Bela-Bela is heavily influenced by the tourism sector, the sale of fuel on weekends, school and public holidays is a large contribution to the monthly and annual fuel demand. Times of economic stagnation and recession have a major effect on the number of tourists that visit Bela-Bela, and accordingly have a major effect on the demand for fuel.

When the economy is in times of economic stagnation and depression, consumers are prone to buy fuel less often (normally at the end of the month) and smaller quantities of fuel (20 litre as opposed to 50 litre).

## 11.4. Conclusion

Of the six interviews, five interviewees expressed that in their experience of the local economy, the amount of fuel sold is a good indicator of the economy and one interviewee were of the impression that the amount of fuel sold cannot be used as an indicator of the economy.

Table 2.10 below gives an overview of the findings in terms of the relationship between the demand for fuel and the economy.

**Table 2.10: Empirical Findings: Fuel Consumption**

| Proxy Indicator | Delmas | Brits | Bela-Bela | Rating | Conclusion |
|---|---|---|---|---|---|
| Fuel Consumption | ✓✓ | ×✓ | ✓✓ | 5/6 | ✓ |

The fuel station managers interviewed were of the opinion that in their experience, the economy has a major influence on the demand for fuel. When the economy is growing, consumers have a positive future outlook and have money to purchase goods and consumables like petrol. They argued that

although there is other major influences such as the international oil price, fuel is such a vital input for a variety of economic activities, that the fuel sales are heavily influenced by local economic fluctuations.

The following trend with regards to fuel sales was recorded in the interviews:

- Consumers are prone to buy **larger quantities** of fuel at the end of the month in times of economic stagnation and depression, compared to consumers filling up more frequently when the economy is growing. Thus, a person will fill up four times a month with 25L, where if the economy is growing, he is more likely to fill up once a month with 100L.

The interviewees felt that the global financial downturn had a major negative effect on the volume of fuel sales. The interviewees further argument that because the use of fuels is such a vital part of almost any economic activity, that the demand for fuel is a very good barometer for the economy.

## 12. Conclusion

This section suggests that the proxy indicators in a number of cases accurately portray the economy. Apart from the above-mentioned relationship, the proxy indicators provide a number of trends with regards to consumer behaviour and the dynamics of the relationship between the indicator and the economy.

Table 2.11 below gives an overview of the key findings.

**Table 2.11: Overview of Empirical Findings**

| Proxy Indicator | Delmas | Brits | Bela-Bela | Conclusion |
|---|---|---|---|---|
| Number of Middle Class Residential properties sold | - | -✓ | ✓✓ | - |
| Growth in Residential Building Activity | - | ✓✓ | ×✓ | - |
| Growth in Non-residential Building Activity | × | -✓ | ×- | ✘ |

| Proxy Indicator | Delmas | Brits | Bela-Bela | Conclusion |
|---|---|---|---|---|
| Submission of residential building Plans | - | - | | ✗ |
| Retail Sales of Durable Goods | -✗ | ✓✓ | ✓✓ | ✓ |
| Business Profit of Durable Goods Retailers | -✗ | ✓- | -✓ | - |
| Volume of Sales of Hardware Retailers | ✓ | ✓✓ | ✓✓ | ✓ |
| Profitability of Hardware Retailers | ✓ | ✓- | -✓ | - |
| The Volume of Sales of Spare Parts for Vehicles | ✓✓ | ✗✓ | ✓✓ | ✓ |
| Fuel Consumption | ✓✓ | ✗✓ | ✓✓ | ✓ |

# Chapter 3: "Indicative Indicators"

***"It is better to know some of the questions than all of the answers."***

***-- James Thurber (1959)***

## 1. Introduction

The study set out to explore the possible use of proxy indicators in order to provide insight into the local economic conditions in South Africa. The following chapter gives an overview of the empirical finding regarding the use of proxy indicators to measure the economy on a local level in South Africa and the level of accuracy between the indicator and the economy. A number of practical implications with regards to the use of the indicators will further be discussed.

## 2. Adopted and Rejected Indicators

In the following section the rational for the adaption or rejection of the indictors as are discussed.

**Table 3.1: Empirical Findings: Conclusion**

| Proxy Indicator | Guidelines for future use | Rationale |
|---|---|---|
| Number of Middle Class Residential properties sold | Adopted with Caution | The sales of middle class residential houses can be used as an indicator of the local economy but caution should be taken with regards to the following:<br>• Although the indicator does not lag behind the economy in times of economic recession, the indicator takes longer to recover after a recession than the economy; caution should thus be taken with regards to the lag in the indicator in times of (rapid) economic growth; and<br>• Because the number of houses sold is a small number in most local economies in South Africa, it is possible that outliers can influence the results, and care should be taken to analyse if the sample size is sufficient to indicate economic cycles. |
| Growth in Residential Building Activity | Adopted with Caution | The residential construction sector can be used as an indicator of the local economy, but caution should be taken with regards to:<br>• The difficulty of locating managers in the local |

| Proxy Indicator | Guidelines for future use | Rationale |
|---|---|---|
| | | construction sector, and the accuracy of understanding of the construction sector by the suppliers of construction material; and<br>• Government contracts that influence the construction sector but that is not driven by market forces. |
| Growth in Non-residential Building Activity | Rejected | The proxy indicator is not recommended because:<br>• Even though the impact of economic fluctuations had a major effect on residential developments, the impact was not as major on non-residential developments;<br>• Non-residential developments are generally larger in size, higher in capital investment and longer in terms of construction and operation and thus not influenced as greatly; and<br>• The majority of non-residential developments are constructed by large construction companies that do not make use of the local stores to purchase products. |
| Submission of residential building Plans | Rejected | The proxy indicator is not recommended because although the economy does influence the number of residential building plans submitted, it is very difficult to abstract the data from the local municipality, and officials struggle to portray the volumes of applications over time. |
| Retail Sales of Durable Goods | Adopted | The growth of durable retail sales is an accurate indicator of the economy. It was however noted that there can be external factors that can have a major effect on the amount of durable goods sold, for example mining developments. |
| Business Profit of Durable Goods Retailers | Adopted with Caution | In general profit margins are higher in times of economic growth compared to times of economic stagnation and recession, but the loss in profitability is attributed to the decline in demand for durable retail goods. It is recommended only to use the indicator in conduction with the sales of retail goods. |
| Volume of Sales of Hardware Retailers | Adopted | Hardware goods economy portrays the economy effectively in the study areas and can accordingly be used as an indicator. |
| Profitability of Hardware Retailers | Adopted with Caution | The profitability of hardware stores is influenced by economic cycles but not to the same extent as the sales of hardware goods. It is recommended only to use the indicator in conduction with the sale of hardware goods. |
| The Volume of Sales of Spare Parts for Vehicles | Adopted | The growth in hardware sales are a good indicator of the economy and are accordingly accepted. |
| Fuel Consumption | Adopted | The demand for fuel as is reflected in fuel sales is an effective indicator of the economy and is accordingly accepted. |

In conclusion, as set out in the table above, the following six proxy indicators closely resembles the behaviour of the local economies in tested and can provide valuable insight into the behaviour of the said economies:

- Number of middle class residential properties sold (with caution);
- Growth in residential building activity (with caution);
- Retail sales of durable goods including business profit ;
- Hardware sales including business profit;
- Volume of sales of spare parts for vehicles; and
- Fuel consumption.

## 3. Implications for Use

***"No; we have been as usual asking the wrong question. It does not matter a hoot what the mockingbird on the chimney is singing. The real and proper question is: Why is it beautiful?"***

***--Bertrand Russell (1956)***

The following subsection gives a number of key implications regarding the use of proxy indicators to measure the economy on a local level in South Africa:

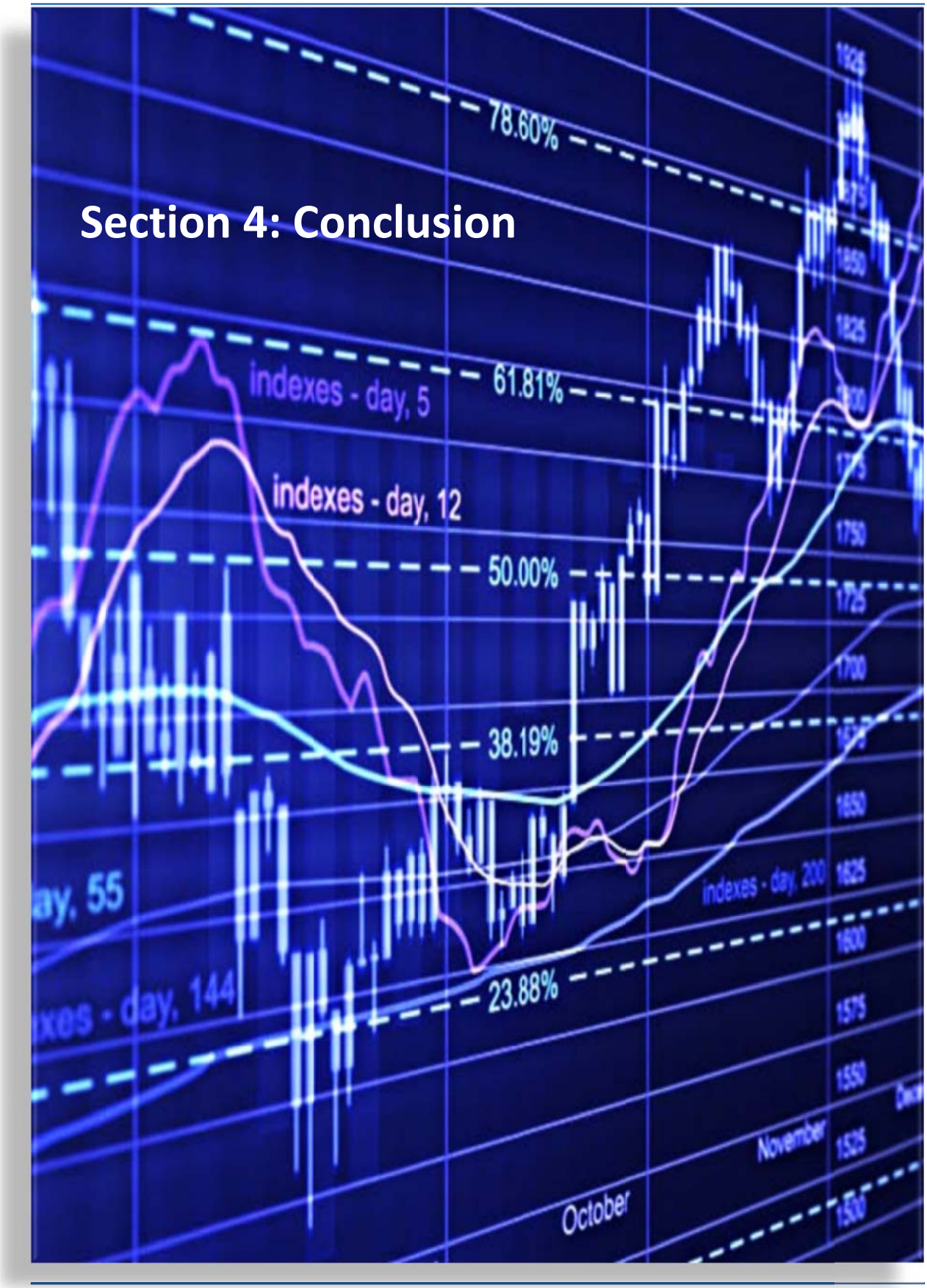
- **General**: Proxy indicators should be used in data scarce areas as a cost and time effective alternative method of data collection. The indicators can provide important insights into the economic conditions on a local level;
- **Scope of indicators:** It is recommended that the set of six indicators are used collectively as a reflection of the economy, and not only one or two of the indicators in order to increase the accuracy of the method;
- **Growth not level**: The aim of the use of indicators is not to identify the level or size of economic activity, but to analyse the stadium of the economy is (stagnation, recession, growth);

- **Area Variances**: Each economy has a unique structure and sectors within each economy interact differently with one another (for example the largest impact on Bela-Bela was the tourism sector and on Delmas the mining sector);
- **Consumer behaviour**: While sales can indicate the growth or decline in the economy, consumer behaviour can give further clarity on the level of growth/decline in the economy; and
- **External influences**: It is important to understand the influence of externalities and to determine what impact the economy had on the proxy indicator and the externality (for example the impact of government housing developments on the growth in residential construction activity).

## 4. Scope for Future Studies

The study did not set out to provide a fool proof proxy indicator model that can measure a local economy, but to determine if there is merit in the concept of using proxy indicators to measure the economy. While the study did provide valuable findings regarding the possible use of proxy indicators to measure the local economy, the following aspects will need to be further analysed in order to develop a more accurate model using proxy indicators.

- It is important to test the proxy indicators in more study areas and in a larger sample size. Areas with a large second economy and rural towns should be given preferences in future studies;
- The study made use of informal interviews to analyse the relationship between the proxy indicator and the economy. An analysis on actual financial statements will provide a more accurate answer if such data is available; and
- It can be useful to test the accuracy of the indicators to an area for which there is up-to-date, accurate and relevant data available in order to compare the data sets to analyse the accuracy of the indicators.




# Section 4: Conclusion

# Chapter 1: Conclusion

***"Judge a man by his questions rather than his answers"***

***--Voltaire (1694 – 1778)***

The fact that Africa is facing major developmental challenges, and that suitable plans and policies based on quality up to date data sources can play a major role in overcoming this developmental challenges, have been thoroughly debated in this article. However, quality up-to-date data is expensive, hard to come by and in many instances non-existent. The researcher proposed the possible use of proxy indicators as a cost and time effective measurement to provide the data in question. In the light of the above, the study set out to identify a set of proxy indicators that accurately portray the economy.

In the first section of the dissertation, the study focused on the relationship between a number of proxy indicators and the national economy in order to identify a set of proxy indicators that accurately portrays the economy. An exceptionally wide range of proxy indicators were tested and were focused on indicators that is easily accessible and available in a variety of geographic areas and scales. The indicators tested included property-related, banking-related, and retail-related proxy indicators.

Of the 40 proxy indicators tested in the first section of the study, the relationship of ten proxy indicators were measured at a correlation of more than 0.80, which were tested in the second section of the dissertation. The following indicators were selected: (1) Number of Middle Class Residential properties sold; (2) Growth in Residential Building Activity; (3) Growth in Non-residential Building Activity; (4) Submission of residential building Plans; (5) Retail Sales of Durable Goods; (6) Business Profit of Durable Goods Retailers; (7) Volume of Sales of Hardware Retailers; (8) Profitability of Hardware Retailers; (9) Volume of Sales of Spare Parts for Vehicles; and (10) Fuel Consumption.

The second section tested the indicators identified in the first section in the local economies of the medium-sized towns of Brits, Delmas and Bela-Bela. The section made use of primary data obtained from 51 interviews with the aim to investigate if the relationship identified between the proxy indicators and the economy in the first section of the study was born out by the experiences of managers of the local economy. The interviews were conducted in the week of 19-23 September 2011.

The study provides valuable insight in to the understanding of local economies in South Africa. In the second section of the study, the field work established that six proxy indicators can be used to measure the local economy in South Africa. These are the (1) number of middle class residential properties sold (with caution); (2) growth in residential building activity (with caution); (3) retail sales of durable goods including business profit; (4) hardware sales including business profit; (5) volume of sales of spare parts for vehicles and; (6) fuel consumption. Apart from the fact that the indicators mirror the economy, a number of trends with regards to the dynamics the relationship between the indicator and the economy were revealed.

The author argue that proxy indicators, like dipsticks in terms of vehicles, can be used as a time and cost effective approach to understanding local economies. The study set out to ask a question, and the results indicate that there is merit in asking more questions regarding the use of proxy indicators in planning; however the full accuracy of the indicators still needs to be verified and tested in more detail. Although the researchers established that proxy indicators can provide valuable insight into a local economy, the phenomenon still suggests a fertile area for research and proposes further studies regarding the testing of a broader range of indicators in additional study areas, especially rural areas in South Africa.

I set out to be an astronaut. I set out to ask questions. I set out to explore alternative measures that can give insight into local economies in South African, and although the research question provided an answer, the dissertation did indeed raise more questions than it answered.

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