Proxy indicators as measure of local economic dispositions in South Africa: An exploratory study

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Abstract

Despite rapid advances and sizeable middle-class formation in many African countries, development planning is still frustrated by the absence of reliable, relevant and up-to-date data. Even though South Africa is in a more fortunate position with regard to the availability of such data, it also has data gaps, notably with regard to informal economic activities in the rural areas of the country. This exploratory article engages the use of proxy indicators to provide cues as to the state of a local economy. The article explores the relationship between a number of potential proxy indicators and the national economy in order to identify those proxy indicators that mirror the national economy. An interview approach was used to test the identified indicators in three small towns in order to establish whether the nationally determined proxies reflect economic trends in practice. The six proxy indicators that closely mirrored the local economies of the three sampled towns represent a modest, introductory exploration of an area worthy of far more empirical research.

INSTAANAANWYSERS AS MAATSTAF VIR PLAASLIKE EKONOMIESE NEIGINGS IN SUID-AFRIKA: 'n VERKENNENDE STUDIE

Ten spyte van die vinnige vooruitgang en groot middelklasvorming in baie Afrika-lande, word ontwikkelingsbeplanning nog gefrustreer deur die afwesigheid van betroubare, relevante en resente data. Hoewel Suid-Afrika in 'n meer gunstige posisie is met betrekking tot die beskikbaarheid van sodanige data, het die land ook datagapings, veral met betrekking tot informele ekonomiese aktiwiteite in die landelike gebiede van die land. Hierdie verkennende artikel besigtig die gebruik van instaan (indirekte) aanwysers om leidrade te verskaf oor die toestand van 'n plaaslike ekonomie. Die artikel ondersoek die verhouding tussen 'n aantal potensiële instaanaanwysers en die nasionale ekonomie om die instaanaanwysers wat die nasionale ekonomie weerspieël, te identifiseer. 'n Onderhoud-benadering is gebruik om die geïdentifiseerde aanwysers in drie klein dorpies te toets om te bepaal of die nasionaal-bepaalde instaners die ekonomiese tendense in die praktyk weerspieël. Die ses instaanaanwysers wat die plaaslike ekonomieë van die drie steekproefdorpe die nouste weerspieël, verteenwoordig 'n beskeie, inleidende verkenning van 'n gebied waardig vir veel meer empiriese navorsing.

DISUPISI TSA PROXY DI SEBEDISOA E LE MOKHOA OA HO METHA MERUO AFRIKA BORWA: PATLISISO E SHEBANG SOHLE

Ntle le ho nyoloha ha dipalo tsa malapa a kholang dichelete tse mahareng ka hara linaha tsa Afrika, merero ya tswelopele e ntse e sokola hoba ho se na tsebo ya sejoale joale hape e tshepahalang. Le ha Afrika Borwa e ntse tla ka koano hoba e na le tsebo ee, e ntse na le bothata hoba tsebo eo e na le diphahla, haholo holo tabeng tsa meruo ya mahaeng e se ka dibukeng. Ka hara dipatlisiso tsena, tshebediso ya disupisi tsa proxy ho fan aka ditsebiso tsa hore na moruo oa selehae na o tsamaea joang. Serapa sena se sheba dikamano mahareng a disupisi tsa proxy tse mmaloa le moruo oa naha. Mokhoa oa ditlhahlobo o sebedisitsoe ho hlahloba disupisi tse bonahetseng ka hara teropo tse nyane tse tharo ho bontsha hore na disupisi tsena na ehlile dia sebetsa. Disupisi tsa ts'eletseng tsa proxy ho feta dia hlokahala.

1. INTRODUCTION

Despite decades of post-colonial rule and sizeable middle-class formation, development remains an elusive ideal for the majority of the population of the African continent (Deloitte & Touche, 2013: 1; Loayza, Teran & Rigolini, 2013: 6; Akukwe, 2013: online; White, 2012: 427; Gumede, 2012: online; Ranganathan & Foster, 2011: 2; Duncan, West, Yoshlda, Flore & Zlemke, 2008: 2267; Smith, 2007: online). While development is, of course, not only dependent on plans and planners, and development is not a logical consequence of plan preparation, there is wide recognition of the value of plans for development in the planning literature (Maccallum & Hopkins, 2012: 485; Albrechts, 2006: 1149; Healey, 2007: 290; Klosterman, 1985). Plans that at least 'have the possibility' of ensuring such development, however, are dependent on the availability and (proper) use of reliable, relevant and up-to-date data, which is generally expensive, difficult to obtain and, in many instances, not available (Krebs & Hamilton, 2009: 2; Coetzee, 2009: 3; USAID, 2006; Lai & Ho, 2002).

While South Africa is in a more fortunate position than most other African countries with regard to the availability of data for planning, it still has significant data gaps, and lacks the skills and resources (financial and human) to undertake and sustain quality research to fill this gap (Coetzee, 2009: 6). It is especially in the area of informal economic activities and data needs in the context of a rural South Africa, where major gaps and limitations are experienced (Mohr & Fourie, 2009; Gumede, 2008: 7; Ligthelm, 2006; Schneider, 2002: 2; Cortright & Reamer, 1998: 13). This data gap is not only highlighted in the academic realm. Planning practitioners regularly lament the lack of up-to-date data in the preparation and review of municipal Integrated Development Plans and Spatial Development Frameworks, and

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applications for land-development rights. Even while there are private service providers of economic data, such data tends to be expensive and not necessarily based on empirical data-gathering that allows for the recording of the influence of unique local economic conditions.

This article explores whether it would be possible to use proxy indicators to measure local economic conditions and to identify proxy indicators that accurately portray local economic conditions. The aim of the article is not to provide a foolproof alternative to other means of data collection, but rather to start a discussion on the use and identification of such proxy indicators.

2. LITERATURE REVIEW

2.1 The use of proxy indicators

A proxy indicator can be any activity, variable or phenomenon that represents a 'condition' to such an extent that it can be used as a substitute for other, preferably empirical data on the particular activity, variable or phenomenon (Landen, 2011: 1; UNDP, 2002: 20). Proxy indicators have become widely used in a number of academic fields, notably the environmental sciences, for trend identification, and in policy preparation and review exercises (Lee & Wang, 2011; Bumann, 2010: 2407; Von Schirnding, 2002: 113; Rozema, Broekman, Van Beem, Meijkamp, De Bakker, Van De Staaij, Stroetenga, Bohncke, Konert, Kars, Peat, Smith & Convey, 2001: 12; Todorov, 2000: 1248). Proxy indicators have also been receiving growing recognition as useful, meso-level economic development indicators in the absence of more fine-grained economic analyses (Rabie, 2011: 149; Russ & Jones, 2008: 189-202; UNDP, 2002: 21; USAID, 1998: 3).

Proxy indicators could be especially useful in a developing country where development pressures are high, and time and resources often under serious pressure, especially so at the municipal level (Provincial Government of the Western Cape, 2009: 4; Benin & Randriamamonjy, 2008: 3; Songsore, Nabila, Amuz, Tutu, Yangyuoru, McGranahan & Kjellén, 1998). A wide range of socio-economic statistics can be used to provide both a multilayered proxy indicator of future economic conditions (UNDP, 2002: 20) and an indication of progress in the short term, while a theory-based framework for making sense of the situation and an accompanying set of indicators are being developed (Rabie, 2011: 149). 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: 309), or 'insurance premiums' as a proxy indicator of a resident's perception of safety (Wong, 2002: 1839). Likewise, fluctuations in the rental property market, or the number of building plans submitted for residential property improvements could be used as indicators of the broader local economy. Should the link between, for instance, the rental property market, or the number and value of such building plans, and the local economy be known, data on the former could be used to provide clues on the latter.

From a development policy and planning perspective, proxy indicators could play a useful role in identifying trends and contributing to the process of policy formulation (Von Schirnding, 2002: 113). Proxy indicators could, for instance, provide valuable insights into the growth and composition of local economies where up-to-date quality data is not available. Given that conventional economic indicators often fail to quantify the extent of the second economy, proxy indicators could possibly provide valuable insights into trends in this badly understood sector of the economy in developing country contexts.

From an epistemological point of view, proxy indicators could provide valuable insights into local economic conditions in cases where up-to-date, reliable data does not exist into situations where traditional economic modulations fail to adequately explore a phenomenon, and could make use of locally observed phenomena to provide insights into complex economic situations (Benin & Randriamamonjy, 2008: 1; Russ & Jones, 2008; King, Robert & Sidney, 1994: 25; Mill & Uselton, 1976). Such proxy indicators could also provide a cost-effective alternative method of data-collection (Provincial Government of the Western Cape, 2009: 4; Songsore *et al*., 1998: 4; Corvalan & Kjellstrom, 1995: 75), and improve the quality of socio-economic data in developing countries with fledgling data-gathering, capture and reporting systems (Chen & William, 2011: 2). Finally, proxy indicators could assist in putting in place a 'new set of more relevant and useful' economic indicators in a rapidly changing world in which mainstream economics and economic indicators are not regarded as necessarily reflective of the economic realities (and challenges) as experienced by people 'in their everyday lives' (Spash, 2012: 1; Hausman, 2008; King *et al*., 1994: 25; Mill & Uselton, 1976; De Marchi, 1970).

While there are many authors who recognise that reliable data is a key element in the planning environment, and there are serious absences and inadequacies in the availability of such data in developing countries (Krebs & Hamilton, 2009; Coetzee, 2009; Zietsman, Ferreira & Van Der Merwe, 2006; Lai & Ho, 2002; Okpala, 2001; Cortright & Reamer, 1998), no research could be found that explored alternative ways of sourcing or providing such local-level economic data, or putting in place a series of local-level proxy indicators. A number of studies were found that explored the use of proxy indicators in other fields, ranging from the use of luminosity data as a proxy for economic statistics (Chen & William, 2011: 2) to the use of proxy indicators for environmental health in Ghana (Songsore *et al*., 1998).

Valuable traits were identified regarding the use and selection of proxy indicators from these studies, including that:

- Proxy indicators have the ability to provide valuable insight into **data-scarce areas**, especially at a local level (Provincial Government of the Western Cape, 2009: 4; Songsore *et al*.,

1998; Benin & Randriamamonjy, 2008: 1);

- Proxy indicators provide a **cost-effective alternative** method of collecting data (Provincial Government of the Western Cape, 2009: 4; Songsore *et al.*, 1998; Corvalan & Kjellstrom, 1995);
- As consumer behaviour changes in accordance with economic cycles (Todd, 2008: online; Clifford, 1985; Bohlen, 2009), **consumer behaviour** can provide valuable insights into the state of the economy in a specific area/region;
- There are a variety of socio-economic statistics that can be used as proxy measures to predict future economic conditions (UNDP, 2002: 20);
- A common starting-point in identifying proxy indicators is literature on **economy-wide models** and on how various sectors of the economy interact with each other (Benin & Randriamamonjy, 2008: 3);
- For proxy indicators to have any value, the data on which they are based needs to be **accurate, timely, and reliable** (US Aid, 1998; Provincial Government of the Western Cape, 2009: 4);
- It is important to **consult** with leaders and experts of the area/ region to determine whether the indicators reflect the unique aspects of their area/region (Russ & Jones, 2008; Songsore *et al*., 1998);
- Proxy indicators have the ability to provide a **less time-consuming** alternative measure of attributes or characteristics that more conventional, mass-research projects would entail (Benin & Randriamamonjy, 2008: 3);
- It is important to have a proxy indicator that has a **strong logical and empirical link** to the attribute (Benin & Randriamamonjy, 2008; Russ & Jones, 2008: 3);
- A proxy indicator relates to the **growth and decline** (the 'dynamics') of an attribute rather than to the level of the attribute at a specific point in time (Wolff, 1999), and
- Proxy indicators can improve the quality of socio-economic data in **developing countries** with low-quality statistical systems (Chen & William, 2011: 2).

3. METHODOLOGY

By following an inductive research method, the relationship between a number of proxy indicators and the economy, in order to identify a set of proxy indicators that mirrors the economy, was undertaken by means of regression analysis. Doing field research through interviews, the identified proxy indicators were tested in relation to the economy of three study areas.

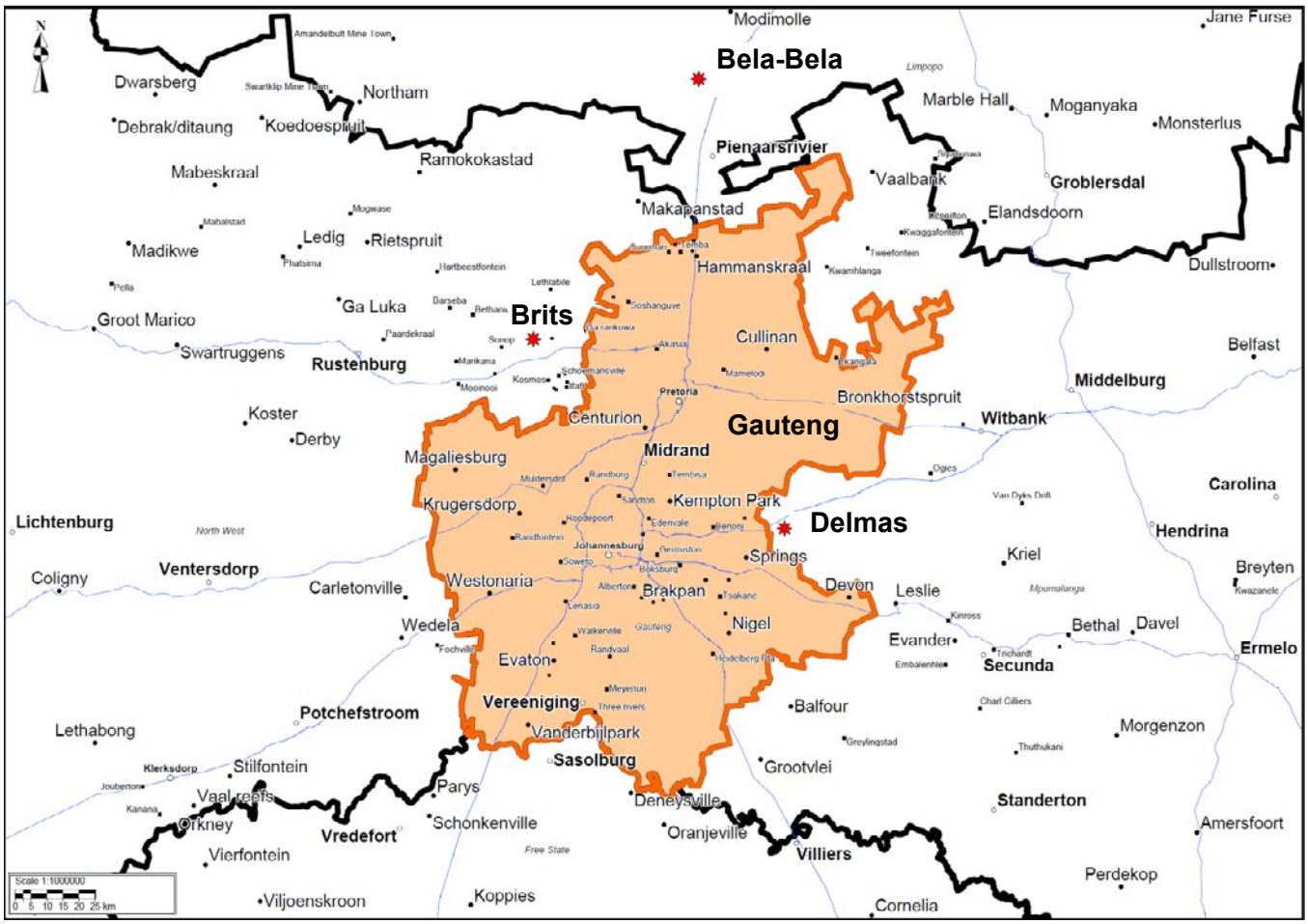

Figure1: Location of the three towns

Source: Authors' own compilation

According to Sykes (1993: 1), regression analysis is a statistical tool for the investigation of relationships between variables for the purpose of predicting future values. To explore and determine whether there are proxy indicators that possibly 'mirror' the national economy, secondary data obtained from a variety of data sources, private companies and individual organisations were used (Table 1). Secondary data is data derived from primary data, instead of first-order experience/ research (Leady & Ormrod, 2005: 89), and thus makes use of a range of existing data sources. Applying the quantitative method to the large volume of numerical data, it was possible to generalise the results to a broad population (Bui, 2009: 13). Forty easily accessible indicators, which included property, banking and retail-related proxy indicators, and which ranged from the number of civil cases for debt to the profitability in the food, beverages and footwear sector, were selected. The rationale in the selection of the indicators was to identify indicators that are easily accessible, available, reliable and accurate in a variety of geographic areas and scales, so as to increase their applicability and future use, should they prove to be (Provincial Government of the Western Cape, 2009: 2).

Using qualitative research in the form of "interpretive research" (Creswell, 1994 cited in Masha, 2000: 6), the indicators were tested against a set of primary data obtained from field research, which was generated through semi-structured interviews with 51 interviewees/participants (business owners and operators 'in practice') in the three sample towns.

The aim of the interviews was to investigate if the relationship identified between the proxy indicators and the national economy was borne out by the experiences of business owners and managers in a sample of local economies. For example, the manager of a real estate agency or senior real estate agent was interviewed to explore the possible use of 'the sale of middle-income residential housing' as an indicator of the state of the local economy, or predictor of the next cycle of the economy, based on the interviewee's experience of the particular local economy. The towns of Brits, Bela-Bela and Delmas (see Figure 1) were selected in which the interviews were conducted using the following criteria:

- The towns should be from three different provinces and municipalities in order to cancel out attributes specific to a particular area/region;
- The towns should be diverse in terms of population size, in order to establish whether the size of the population has an effect on the validity/accuracy of the proxy;
- The towns should be diverse in terms of economy, in order to identify if the structure and composition of the local economy has an effect on the validity/accuracy of the proxy;
- The chosen towns should be the only settlements in the local municipality, to ensure that the local economy was not 'spread/ diluted' between a series of towns, and
- The areas should be in close proximity to Gauteng, where the researchers were based, to limit travel time and expenses.

3.1 Data analysis and interpretation of findings

3.1.1 Regression analysis

The relationship between variables in statistics can be calculated using any modelling technique and is generally referred to as a regression analysis (Freedman, 2005). The analysis entailed both time series and correlation analyses, and to simplify the analysis, the time-series data was expressed in percentages and illustrated graphically (Cortright & Reamer, 1998). In order to enable comparison, the data was expressed as a percentage growth or decline over time at constant prices (Bui, 2009). As such, each of the proxy indicators was tested by means of time-series analysis against the total national GDP at constant prices over a five-year period (2005 to 2010). The statistical analysis entailed that the cycle (growth and decline) of each proxy indicator was compared to the cycle of the national economy, and then analysed according to its relationship with the national economy (pro-cyclic, counter-cyclic or acyclic), and its timing with regard to economic fluctuations in the national economy (leading, lagging or coincident) by means of a series of correlation-coefficient analyses. A correlation coefficient is an indication of how strong a linear relationship exists between two numeric variables (Farlex Dictionary, 2012). The results of these analyses were then used to categorise the proxy indicators in accordance with their relationship (nature, extent and timing) with the national economy. Correlations above 0.80 are generally considered high and suitable for economic modelling and forecasting (Ezekiel & Fox, 1959; Oosterhof, 1999).

3.1.2 Interviews

Berg (1989: 6) and Creswell (as cited in Masha, 2000: 5) both argue that qualitative techniques allow the researcher to obtain personal opinions and perceptions of people. The aim of the interview questionnaire was to ask simple questions in terms of the experience of the interviewee with the set proxy indicator. According to Chadwick, Bahr & Albrecht (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. The results of these interviews were then used to categorise the proxy indicators in terms of the relationship between the proxy indicator and the economy by means of the following symbols:

- × 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; and

✓ Indicator is recommended by the interviewee to be used as a proxy indicator.

4. RESULTS AND FINDINGS

4.1 Regression analysis and proxy indicators

Table 1 illustrates the results of the correlations between the proxy indicator and the economy.

Table 1 indicates that the accuracy of the relationship between the economy and the proxy indicators (expressed in terms of correlation) differ substantially. A key aspect to take into consideration when working with correlations is not to assume that a correlation means that a change in one variable causes a change in another. Correlations above 0.80 are generally considered high. It is proposed from Table 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. For purposes of this article, only the attributes of each proxy indicator with a correlation of 0.80 and higher are discussed.

The volume of sales of durable goods reflects the behaviour of the economy most accurately, with a correlation of 0.95. The growth in the volume of durable retail sales is more sensitive in times of economic stagnations and recessions. The relationship can accordingly be defined as a pro-cyclic coincidental indicator.

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.

The demand for fuel represents the general trends in the behaviour of

Table 1: Proxy indicator correlation and key findings of the regression analysis

Nr	Proxy indicator	Subcategories	Correlation (r)	Key findings/Attributes	Source
Property-related proxy indicators					
1	Number of residential properties sold	Affordable housing	0.66	Middle-class housing (141m²-220m²) is the most accurate proxy indicator of the three types of housing studied. It is a leading indicator that mirrored the national economy, except for a major change in the second quarter of 2009 to the second quarter of 2010.	ABSA House Price Index
		Middle-class housing	**0.81**		
		High-end housing	0.65		
2	Growth in building activity	**Residential**	**0.82**	The data suggests a pro-cyclic and leading relationship between activity in the construction sector and the national economy.	BER: Building and Construction Survey
		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 national economy. The number of residential building plans passed mirrors the behaviour of the national economy most accurately (compared to non-residential building plans and building additions).	Quantec databases
		Non-residential	0.54		
		Additions	0.59		
Retail-related proxy indicators					
4	Retail sales	Semi-durable	0.27	The volume of sales of durable goods closely mirrors the behaviour of the national economy. The relationship can be defined as pro-cyclic and coincidental.	BER: Retail Survey (2005-2010)
		Durable	**0.95**		
		Non-durable	0.62		
5	Business profit	Semi-durable	0.58	While the profitability of the retail sector in South Africa generally mirrors the behaviour of the national economy, the profitability of durable goods reflects the behaviour of the national economy most accurately as a pro-cyclic and coincidental indicator.	BER: Retail Survey (2005-2010)
		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 mirrors the national economy to such an extent that it can be used as a proxy indicator.	BER: Retail Survey (2005-2010)
		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 mirrors the national economy to such an extent that it can be used as a proxy indicator.	BER: Retail Survey (2005-2010)
		Profitability	0.60		
8	Hardware retailers	**Volume of sales**	**0.90**	Both the volume of sales in hardware stores and the profitability of such sales mirror the behaviour of the national economy. The relationship between hardware stores and the economy can be classified as a pro-cyclic and coincidental indicator.	BER: Retail Survey (2005-2010)
		Profitability	**0.85**		
9	Building materials	Volume of sales	0.66	Although some similarities exist between the national economy and the building material, the correlation fluctuates over time and can accordingly not be used as a reliable proxy indicator.	BER: Retail Survey (2005-2010)
		Profitability	0.62		

Nr	Proxy indicator	Subcategories	Correlation (r)	Key findings/Attributes	Source
10	Textiles, clothing and footwear	Volume of sales	0.34	There are some similarities between the national economy and retailers that sell textiles.	BER: Retail Survey (2005-2010)
		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 correlation fluctuates to such an extent that it cannot be used for reliable economic modelling.	BER: Retail Survey (2005-2010)
		Profitability	0.16		
12	Vehicles	New vehicles	0.73	The growth of spare-part sales mirrors the behaviour of the national economy more accurately than used and new vehicles.	BER: Retail Survey (2005-2010)
		Used vehicles	0.53		
		Spare Parts	**0.80**		
Banking-related proxy indicators					
13	House bonds		0.43	Although some similarities exist between the national economy and the number of housing bonds approved, the correlation fluctuates over time and can accordingly not be used as a reliable proxy indicator.	Ernst & Young: Financial Services Index (2005-2010)
14	Bank deposits		0.33	The volume of bank deposits mirrors the general behaviour of the national economy, but with a low correlation of 0.33.	Ernst & Young: Financial Services Index (2005-2007)
15	Savings	Short-term	0.59	Short- and long-term savings do not mirror the behaviour of the national economy to such an extent that they can be used as accurate measures of the national economy.	Ernst & Young: Financial Services Index (2005-2007)
		Long-term	0.46		
16	Banking income		0.77	Business confidence in retail banking is an accurate indicator of the behaviour of the national economy. It is a pro-cyclic coincidental indicator.	Ernst & Young: Financial Services Index (2005-2010)
17	Business confidence		0.79	Retail banking income mirrors the behaviour of the national economy. Retail banking income is a pro-cyclic leading indicator, but does not mirror the behaviour of the national economy to the same extent as business confidence in retail banking.	Ernst & Young: Financial Services Index (2005-2010)
Other proxy indicators					
18	Fuel consumption		**0.86**	The demand for fuel mirrors the general trend in the behaviour of the national economy. It is important to note that the demand for fuel is strongly influenced by other variables such as the global oil price and the strength of the South African currency in international markets when considering its use as proxy indicator.	SAPIA
19	Electricity use		0.71	The demand for electricity mirrors the behaviour of the national economy. It can be defined as a pro-cyclic leading indicator.	Quantec
20	Civil cases		-0.12	Although the number of civil cases mirrors the behaviour of the national economy in an anti-cyclical way, it does not do so in a strong enough way to be used as a reliable proxy indicator.	Quantec
21	Reported crime		-0.42	The key trend in the relationship between the economy and crime 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, an increase in crime can signal a downward trend in the national economy.	SAPD

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 indicator, with a correlation of 0.86.

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.

The profitability of the retail sector in terms of durable goods in South Africa reflects the behaviour of the economy most accurately. The relationship can accordingly be defined as a pro-cyclic coincidental indicator measured at a correlation of 0.83.

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 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.

There is a positive correlation between non-residential building activity and the economy. The relationship is pro-cyclic with a correlation of 0.80.

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

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.

Figures 2 and 3 provide examples of high and low degrees of correlation, as found in the surveys.

4.2 Interview results

Table 2 shows concisely the interviewees' overall belief in terms of the relationship between the proxy indicators (as identified in the regression analysis) and the economy.

The following symbols are used to indicate the interviewees' overall belief in terms of the relationship between the proxy 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.

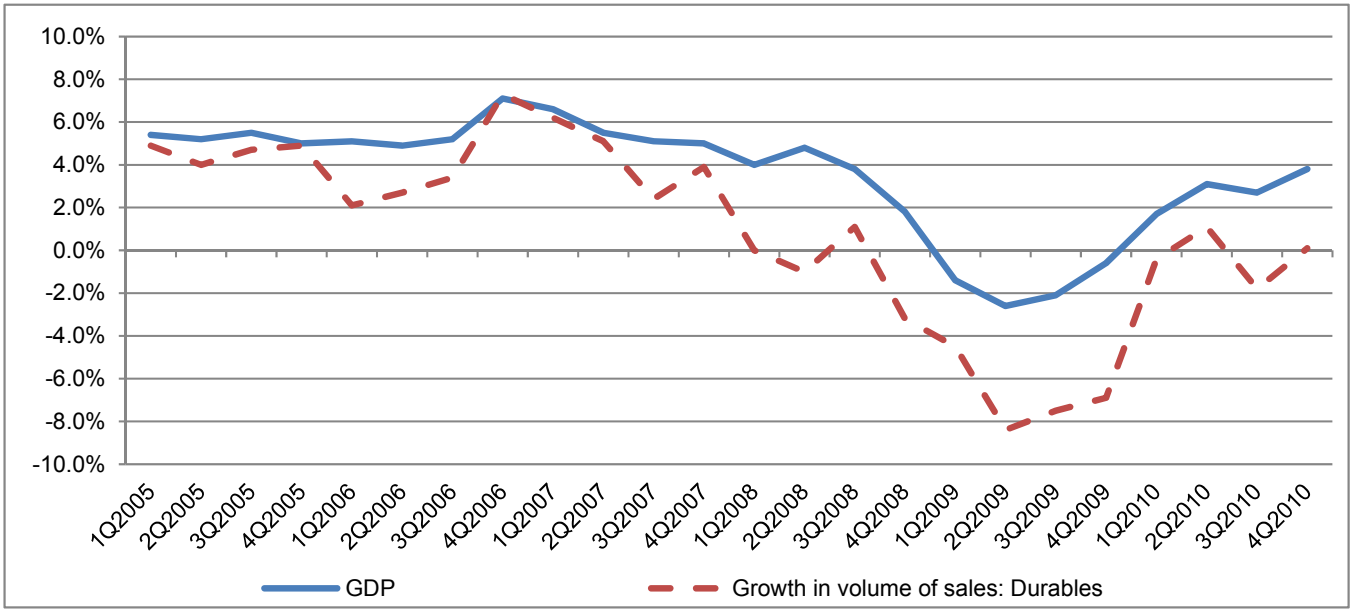

Figure 2: Growth in durable retail sales (Example of high correlation)
Source: Barnard, 2013: 66

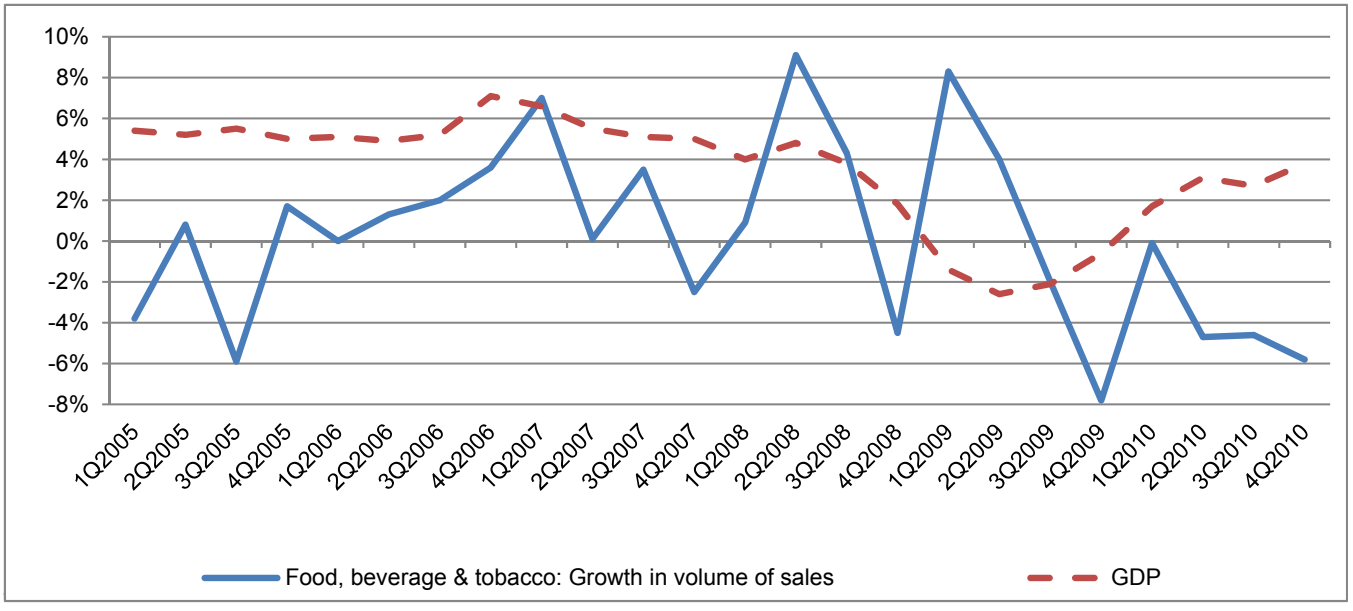

Figure 3: Growth in retail sales: Food, beverages and tobacco (Example of low correlation)
Source: Barnard, 2013: 78

✓ Indicator is recommended by the interviewee to be used as a proxy indicator.

The empirical research revealed that six proxy indicators best resembled the behaviour of the local economies as tested, and could be used as indicators of the state of the local economy of the three sample towns. These six proxy indicators and caveats for their use are discussed below.

Retail sales of durable goods, including business profit from such sales: While the growth of durable retail sales was found to be an accurate indicator of the economies of the three sample towns, it was noted, in some interviews, that there may be external factors that can have a major effect on the amount of durable goods sold, for example mine closures due to changes in global demand and/or commodity pricing. This reduces its predictive power with regard to local economic trends.

Hardware sales, including business profit from such sales: Sales of hardware goods portrayed the economy in the study areas and could be used as proxy indicator without caveats.

The volume of fuel sales mirrored the local economy strongly in all three the sample towns and could be used as proxy indicator without caveats.

Number of middle-income residential properties sold (with caution): The number of middle-income residential houses sold provides a good indication of the local economy. Caution should, however, be taken if used as an indicator, because the sector takes longer to recover after a recession than the upswing in the local economy and the number of such houses that are sold in most rural towns in South Africa is small.

Growth in residential building activity (with caution): The residential construction sector closely resembles the growth and decline of the economy, but care should be taken in terms of the accuracy of 'reading the construction sector' through the opinions of suppliers of construction material and government contracts, which influence the construction sector, but are not driven by market forces.

The volume of sales of spare parts was found to be a useful indicator of the local economies of the three case towns and could be used as proxy without caveats.

The profitability of hardware stores is influenced by economic cycles, but not to the same extent as the actual sales of hardware goods. It is hence recommended that it only be used as indicator in conjunction with the sales of hardware goods.

Profit margins were found to be a useful indicator of the economic health of the three towns, but were found to be tied more to number of sales, and less so to prices and the profit per item sold. It is hence

Table 2: Interviewees' overall views/beliefs in terms of the relationship between the proxy indicator and the economy

Proxy indicator	Interviewee	Views/Beliefs of interviewees in the three towns			Conclusion	
		Delmas	Brits	Bela-Bela		
Number of middle-class residential properties sold	Established real estate agents	-	-✓	✓✓	-	Indicator can provide valuable information about the local economy, but should be used with caution.
Growth in residential building activity	Construction sector supplier managers	-	✓✓	×✓	-	Indicator can provide valuable information about the local economy, but should be used with caution.
Growth in non-residential building activity	Construction sector suppliers managers	×	-✓	×-	×	Indicator is not recommended by the interviewees to be used as a proxy indicator.
Submission of residential building plans	Municipality official in building plans division	-	-		×	Indicator is not recommended by the interviewees to be used as a proxy indicator.
Retail sales of durable goods	Durable goods store managers	-×	✓✓	✓✓	✓	Indicator is recommended by the interviewees to be used as a proxy indicator.
Business profit of durable goods retailers	Durable goods store managers	-×	✓-	-✓	-	Indicator can provide valuable information about the local economy, but should be used with caution.
Volume of sales of hardware retailers	Hardware retailer managers	✓	✓✓	✓✓	✓	Indicator is recommended by the interviewee to be used as a proxy indicator.
Profitability of hardware retailers	Hardware retailer managers	✓	✓-	-✓	-	Indicator can provide valuable information about the local economy, but should be used with caution.
The volume of sales of spare parts for vehicles	Spare-part stores managers	✓✓	×✓	✓✓	✓	Indicator is recommended by the interviewee to be used as a proxy indicator.
Fuel consumption	Fuel stations managers	✓✓	×✓	✓✓	✓	Indicator is recommended by the interviewee to be used as a proxy indicator.

recommended that the indicator be used in conjunction with the sales of durable goods.

Growth in non-residential building activity was found to be a good indication of the state of the local economy in the three towns. This indicator is especially useful, because, in contrast to residential building activity where even small economic changes tend to have a significant effect on residential building activity, this is not the case with non-residential development projects, which are less influenced by short-term economic fluctuations. Care should, however, be taken as to use of the proxy as descriptor and predictor of the local economy, as the majority of non-residential developments are undertaken by large construction companies that do not purchase products from local stores.

The proxy indicator is not recommended, because, even though the local economy influences the number of residential building plans submitted, it is difficult to extract the data from the local municipality, and the data is often not recorded in a useful time-series format in municipal offices. Furthermore, while building plans can be submitted, construction only takes place at a later stage, which reduces the multiplier impact of such activity in the local economy.

5. CONCLUSION AND RECOMMENDATION

Africa is facing major developmental challenges, but lacks reliable, up-to-date data for preparing development plans and policies that can assist in overcoming these challenges. Such data is expensive, hard to come by and, in many instances, not specific enough for use at the local level.

Forty proxy indicators that are readily available and easily accessible in a variety of geographic areas and scales, with the aim of identifying a set of proxy indicators that accurately portray/mirror it (i.e., the national economy) were identified. By making use of regression analysis, the relationships between these indicators (including property-, banking- and retail-related proxy indicators) and the national economy were tested. Ten of the indicators had a correlation of more than 0.80, which suggests a strong linear relationship between the variables. These were: number of middle-class residential properties sold; growth in residential building activity; growth in non-residential building activity; 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; volume of sales of spare parts for vehicles, and fuel consumption.

These ten indicators were then tested in the medium-sized towns of Brits, Delmas and Bela-Bela. Primary data was obtained through 51 interviews in these three towns, with the aim to investigate if the relationship identified between the proxy indicators and the economy was borne out by the experiences of key informants of the local economies in these towns. The interviews were conducted in September 2011. The empirical study revealed six proxy indicators that mirrored the local economies of the three towns and that hold potential as proxy indicators for local economies in small to medium towns in South Africa. These are: the 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; the volume of sales of spare parts for vehicles, and fuel consumption. Apart from the fact that the indicators mirror the economy, a number of trends with regard to the nature of the dynamics in the relationship between the indicator and the economy were revealed.

While these six indicators could be used ‘as is’ to provide insights into local economies elsewhere, it should be noted that in the same manner as a dipstick does not replace a full service of a car, the use of proxy indicators is not meant to replace the practice of traditional data. Proxy indicators can provide a time and cost-effective indication of what is going on in a local economy, especially so in rural South Africa. At the same time and far more importantly than the indicators themselves at this stage, is ‘that far more research into the phenomenon and the variables that could (best) be used as proxy indicators, is required’. Should this be done, useful tools for development-planning purposes could very likely be developed.

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