Measuring business performance: A case study

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Most studies consider business performance to be a multidimensional construct. Four dimensions (namely, business growth, profitability, image and customer loyalty, and product service innovativeness) were hypothesised to validate a measure for business performance in the South African context. Using partial least squares, 22 responses from top executives of banks in South Africa were analysed to test the validity of the four dimensions of business performance. The results of the study suggest that the non-financial dimensions (namely, image and customer loyalty, and product service innovation) are not valid dimensions for measuring business performance, while the other two dimensions (namely, business growth and profitability) show a high degree of correlation. This indicates that business growth is aligned with profitability, that growth for profitability is a major concern, and that profitability still remains the key measure of business performance in the South African banking sector. Parameters such as customer loyalty and innovativeness are not regarded as important for business performance, although these could be pressing issues for banks. The paper also validates a questionnaire that can be used to measure business performance and reviews various methods for measuring business performance.

Introduction

Measuring business performance is complex because of the many objectives of business. Profit maximisation remains one of the key objectives of business, although the debate around this issue has not reached any final conclusions.

Balance sheets and profit/loss accounts are the traditional and most popular means of measuring business performance. The inherent weakness of these measures, however, is that they fail to capture non-financial parameters such as goodwill and customer loyalty. These parameters become more meaningful when so-called 'financially sound' companies are liquidated overnight or go out of business in due course. Proponents of accounting-based performance measures give due cognisance to non-financial parameters, but they do not offer a measurement technique.

This paper deals with the various methods for measuring business performance, and develops an instrument for measuring business performance in the South African banking sector.

Literature review

Review of techniques used in measuring business performance

Recognising the importance of the issues of measurement, researchers and practitioners have developed a variety of performance measurement approaches (Parkan & Wu 1999: 202). A review of selected[1] measures follows.

Economic value added (EVA)

The concept of EVA is based on maximising shareholders value, as against the profit maximisation objective of a firm. The best way to maximise shareholder returns is to 'incentivise' management to make decisions that increase long-term value (Stern 1990). Stern further explains that incentivis-

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1 The techniques that are readily available in the textbooks (namely, accounting-based measures such as return on investments and return on assets) are not covered in this article. For details on these techniques, any textbook on financial management can be referred to.

ing management to increase shareholder value means nothing unless executives understand how value is created. Shareholder value is created only when the rate of return on capital exceeds the cost of that capital. The precise amount of value added is equal to the amount of total capital invested, multiplied by the difference between return on capital and cost of the capital. In essence, this is best described as 'residual income', referred to as economic value added (Stern 1990).

Evidence confirms that managers respond to EVA incentives, but there is no evidence thus far to support claims that EVA is more closely associated with equity returns or firm value than is net income (Biddle 1998). Biddle further refers to a study entitled 'Does EVA beat earnings? Evidence on associations with stock returns and firm values'. This study empirically tested whether EVA is superior to accounting-based competitors in explaining changes in shareholder wealth and found no support for this claim. In contrast, the study reported that earnings before extraordinary items dominate EVA in comparisons of relative information content for explaining stock returns and firm values.

The value added statement is published by about 210 of the 400 companies listed in the industrial sector of the Johannesburg Stock Exchange (Staden 1998). Staden examines the usefulness of the value added statement in South Africa. The result indicates that the respondents did not make significant use of value added statements and that the statements had severe shortcomings that impacted on their usefulness. Staden also observes a declining trend of use. The shortcomings experienced by most respondent groups are reported in Table 1.

Table 1: Shortcomings experienced with EVA

	Shortcomings	% Respondents
1.	It is confusing. Technical differences are encountered in practice.	57%
2.	It is not standardised. There is no statement of GAAP.	63%
3.	The information is not verifiable and is therefore under suspicion.	51%
4.	It is not a faultless measure of productivity.	57%
5.	There is no benchmark or other information with which to compare value added information.	51%

Source: Staden (1998: 56)

Staden (1998) further concludes that if the reactions of the users of external financial statements are used as a criterion for the publication of value added statements, these statements should no longer be published in South Africa, as no evidence of significant use can be found, and there is moreover no significant support for further use.

In European countries, EVA has had to overcome stiff resistance to gain acceptance, and sizable cultural differences explain the problem (Stern & Shiely 2001).

It is true that EVA is a measure of internal performance and causes managers to act like owners (thereby reducing conflict between owners and managers). Staden's (1998) study suggests that it is difficult to replace the traditional measures of performance with EVA.

Data envelopment analysis (DEA)

Financial ratios are used to measure the performance of banks. Yeh (1996) notes that the major drawback of this approach is its reliance on benchmark ratios, which could be arbitrary and may mislead analysts. These financial ratios do not capture the long-term performance and aggregate many aspects of performance, such as operations, marketing and financing (Sherman & Gold 1985).

Based on previous research, Sathye (2001) reports that, in recent years, there has been a trend towards measuring the performance of banks using one of the frontier analysis methods. In frontier analysis, the institutions that perform better relative to a particular standard are separated from those that perform poorly. Such separation is done either by applying a non-parametric or parametric frontier analysis to firms within the financial service industry. The parametric approach includes stochastic frontier analysis, for example, and the non-parametric approach is data envelopment analysis.

It should be noted that the DEA approach is a relative measure of efficiency, because it compares a firm's observed outputs and inputs and identifies the 'best practice' firm(s) in a group; each firm in a group is then measured relative to the 'best' firm. (Ayadi, Adebayo & Omolehinwa 1998). DEA calculates the relative efficiency scores of various decision-making units (DMU) in the particular sample, and it may be possible for a unit outside the sample to achieve higher efficiency than the best practice of a DMU in the sample (Sathye 2001: 9–10).

Knowing which efficient banks are most comparable to the inefficient bank enables the analyst to develop an understanding of the nature of inefficiencies and to re-allocate scarce resources to improve productivity. This feature of DEA is clearly a useful decision-making tool in benchmarking (Sathye 2001). Sathye suggests that as a matter of sound managerial practice, profitability measures should be compared with DEA results and significant disagreement investigated.

In a study comparing DEA and ratio analysis as tools for performance assessment, Thanassoulis, Boussofiane & Dyson (1996) found that the two methods agree reasonably closely on the performance of the units as a whole, though this depends on the way the performance indicators are combined into a summary figure of performance. They reach the following conclusions:

■ The two methods can disagree substantially on the relative performance of individual units.

■ Ratios do provide useful information on the performance of a unit on specific aspects.

■ They support the communication of DEA results to non-specialists when the two methods agree on performance.

Operational competitive rating procedure (OCRA)

OCRA analysis is a relative performance measurement approach based on a non-parametric model (Parkan & Wu 1999). It requires simple, non-iterative computations to obtain ratings that gauge the production unit's (PU) relative operational performance, as compared with DEA, which uses linear programming as its computational procedure to obtain the PU's efficiency rating.

Other techniques

Another new measure, namely the balanced scorecard by Kaplan & Norton (1996), is intended for manufacturing organisations. The concept of the performance prism (Neely, Adams & Crowe 2001) addresses the shortcoming of many of the traditional measurement frameworks used by organisations today. The performance prism, with its comprehensive stakeholder orientation, encourages executives to consider the wants and needs of all the organisation's stakeholders, rather than a subset, as well as the associated strategies, processes and capabilities. The five interrelated facets of the prism are stakeholder satisfaction, strategies, processes, capabilities and stakeholder contribution, with each representing its role in the performance. It should be noted that the performance prism is not a prescriptive measurement framework but a tool that can be used by management teams to influence their thinking about the key questions they want to address when seeking to manage their business (Neely et al. 2001).

Despite the development of the techniques discussed, traditional financial measures in association with non-financial measures continue to be widely used by various studies, and multiple measures are employed to measure business performance. Accordingly, a review of 15 studies measuring business performance, covering a period of some two decades, is reported in the next section.

Review of studies measuring business performance

A review of various studies that measured business performance is summarised in Table 2. The first column in the table lists the authors and year of publication, the second column describes the study details and the third column refers to the parameters used by the study to measure business performance (such as return on assets or sales growth). The last column shows the type of measure (namely, subjective or objective). The objective approach refers to the financial data provided by the organisation, whereas the subjective measurement calls upon the perception of respondents (Croteau & Bergeron 2001). Objective measures would be actual percentage figures for sales, growth or profitability, and the term 'subjective' is used to mean that a company's performance score is derived using a scale with anchors such as 'very poor' or 'very good' compared to competitors (Dawes 1999).

Table 2: Review of studies measuring business performance

Author(s)	Topic dealt with	Parameters used to measure business performance	Type of measure: subjective/objective[2] financial and/or non-financial
Anderson (2000)	Strategic planning has positive performance effects across industries, and exists in tandem with autonomous actions.	Return on assets, sales growth and innovation.	Subjective, financial and non-financial
Anderson (2001)	Enhancement of an organisation's communication capacity using IT and business performance.	Self-assessments of an organisation's profitability, sales growth and the level of innovation in the organisation.	Subjective, financial and non-financial
Ansoff & Sullivan (1993)	A formula for strategic success, which states that the profitability of a firm is optimised when its strategic behaviour is aligned with its environment.	Objective, average financial performance (return on investment/return of equity) over the past five years.	Objective and financial factor
Bergeron, Raymond & Rivard (1999)	The concept of fit in IS research.	Long-term profitability, growth of sales, financial resources (liquidity and investment capacity), public image and client loyalty	Subjective, financial and non-financial
Cragg, King & Hussain (2002)	This study focuses on measuring the alignment of business strategy and IT strategy among small UK manufacturing firms and then investigates the link between alignment and performance.	Long-term profitability, sales growth, financial resources, public image and client loyalty were the dimensions used to measure business performance on the basis of executive perceptions.	Subjective, financial and non-financial
Croteau & Bergeron (2001)	To explore the existence of a direct link between IT managment and organisational performance. To determine, given the business strategy, what profile of technological deployment best helps firms enhance their performance.	User's perception of organisational sales growth and profitability.	Subjective, financial and non-financial

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Dess & Robinson (1984)	Strategic management researchers often encountrer problems in obtaining objective measures of selected aspects of organisational performance that are reliable and valid. In the case of privately held firms, such data are frequently unavailable. In the case of conglomerate business units, all or parts of such data are inextricably interwoven with corporate-wide data. This paper examines the usefulness of subjective performance measures, obtained from top management teams, when problems are encountered in obtaining accurate performance information.	The study uses sales growth, return on asset and global measures of organisational performance to collect data from 26 manufacturing organisations.	Subjective and objective, financial and non-financial. The study found a strong correlation between subjective and objective measures. However, it concludes that subjective measures should only be used where objective measures of business performance are not available for various reasons.
Durand & Coeurderoy (2001)	The study combines the dimensions of a firm's age, order of entry and strategic orientations, as well as industry conditions, to establish a contingency model of performance analysis.	Profitability, return on assets, growth of sales, growth of margins and growth in the number of employees.	The average of each item for a three-year period was standardised on a five-point scale. Objective, financial and non-financial.
Gopala-krishnan (2000)	Using data from the banking industry, this study builds a bridge between two dimen-sions of innovation (speed and magnitude) and two measures of a firm's per-formance (objective financial reports and executive ratings of perceived effectiveness). The results indicate that different dimensions were linked to different measures of performance. The results also showed that innovation speed resulted in positive financial performance, rather than executives' positive performance. Innovation magnitude is associated with executives' positive percep-tion of firm performance, even thought it may not directly increase a firm's financial returns.	Two measures of bank performance were used: the objective measure of financial performance and the subjective executive rating of effectiveness. Return on assets was the only measure of financial performance used. The executives' rating of effectiveness was collected based on factors such as efficiency of operations and quality of services provided, as compared with the rival bank, on a five-point Likert scale.	Objective and subjective financial and non-financial. Some of the dimensions resulted in positive association with objective measures only, while other dimensions were associated with subjective measures only.

Table 2: (Continued)

Author(s)	Topic dealt with	Parameters used to measure business performance	Type of measure: subjective/objective financial and/or non-financial
Mehra (1996)	Explores the implications of studying industry competitive patterns at the leve of resource accumulation and the relationship between resource endowments and firm performance in the US banking industry.	The study used strategic performance as opposed to economic performance along three dimensions: profitability, productivity and ability to raise long-term resources.	Objective
Papke-Shields & Malhotra (2001)	The study examines the role of both influence and involvement in achieving better business performance, which authors expect to occur through alignment between the organisational and manufacturing strategies rather than directly.	The study uses respondents' perceptions on two dimensions (growth and profitability) to measure business performance, and each dimenson is operationalised using two indicators.	Subjective, financial and non-financial
Peek, Rosengren & Kasirye (1999)	Change in business strategy by the foreign owners (of US banks) was generally not successful in raising a bank's performance level to that of its domestic peers.	The study uses factors such as financial ratios, capital ratio, non-performiang loans and return on assets.	Objective, financial
Rogers & Bamford (2002)	Information processing theory is used to examine the unique planning processes of banks pursuing different strategies. The co-alignment of strategy, planning and information is examined in top-performing banks, and the performance implications of fit are revealed.	Archival measure of return on assets (ROA). Authors indicate that ROA is the most commonly accepted measure of performance in the banking industry.	Objective and only one financial indicator.
Venkatra-man (1989)	The study aimed at conceptualising and developing valid measurements of key dimensions of a strategy construct, termed 'stategic orientation of business enterprises'. Moving beyond the exploration of relationships between strategy dimensions, the study related business strategy to business performance.	Businesss performance was defined in terms of two dimensions (growth and profitability). These dimensions were operationalised using multi-item measures. Subjective assessments of respondents were sought.	Subjective, financial and non-financial

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Woodside, Sullivan & Trappey (1999)	Assessing the relationship among strategic types, distinctive market competencies and organisational performance.	Three items (return on investment, profit and customer satisfaction).	Subjective, financial and non-financial

The review of studies measuring business performance reveals that:

■ To measure business performance, there should be a relationship between the variable being tested and a specific dimension of business performance (Gopalakrishnan 2000).

■ Financial measures are used as objective or subjective measures (Anderson 2000; Ansoff & Sullivan 1993; Bergeron, Raymond & Rivard 1999).

■ Eight out of 15 studies listed in Table 2 use return on assets/investment as a measure of performance. According to Rogers & Bamford (2002: 209), return on assets is the most commonly accepted measure of performance in the banking industry.

■ Most researchers consider business performancemance to be multidimensional. Organisational profitability, sales growth, level of innovation, return on assets, customer satisfaction, and growth in the number of employees are the main dimensions that are used by the studies to measure business performance, as summarised in Table 2.

■ As regards the debate between using subjective or objective measures, Dess & Robinson (1984) conclude that neither approach (objective or subjective) is preferable to the other, each producing similar results; while Croteau & Bergeron (2001) report that in each case, the results obtained were comparable and significant. No evidence has been provided by any study to show that either objective or subjective measures are better. However, Dess & Robinson (1984) indicate that subjective measures are accepted research practice in situations where objective performance indicators are not available for various reasons, for example, in the case of conglomerate business units, where all or parts of such data are inextricably interwoven with corporate-wide data, as well as in the case of privately held firms, where such data are frequently unavailable. The Dess & Robinson study shows a high degree of correlation between subjective and objective data, however, and they warn that subjective measures should not be conveniently substi-

tuted for objective measures of a firm's economic performance. Based on previous research, Dawes (1999) also concludes that there is a strong correlation between objective and subjective performance measures. He cautions that this correlation is far from perfect, however, and concludes that researchers should attempt to validate their research by using both types of measures. Dawes' conclusion is theoretical, as perfect correlation is not possible in the social sciences. The high degree of positive correlation between subjective and objective measures suggests that researchers could use subjective measures, with the limitation that perfect correlation between the two is difficult to obtain in practice.

Development of a measurement instrument for gauging business performance

This paper deals with the development of a measurement instrument for gauging business performance in the banking sector in South Africa.

Selection of dimensions and construct conceptualisation

In line with the previous research summarised in Table 2, business performance (BP) was considered as multidimensional, with four dimensions: business growth (BG), profitability or financial profitability (FP), image and customer loyalty (CL) and product service innovativeness (INNOV). Each dimension was operationalised using the questionnaire shown in Annexure 1. A copy of the questionnaire is given in Table 3 to show the coding of indicators.

Subjective measures, as discussed earlier, should not be used where objective measures are available. The study faced two problems in relying on objective measures. Firstly, there were no objective measures for all the dimensions that were to be measured, for example, customer loyalty and innovativeness. Secondly, the majority of banking businesses in South Africa are conglomerate business units, and in such situations, the data, or parts of the data, are inextricably interwoven with

Table 3: Questionnaire for measuring business performance, showing coding of indicators

Sl. No.	Code used	Please indicate your best estimate of your bank's position on average **relative to that of close competitors over the past two years**.	**Much worse than competitors**					**Much better than competitors**
			1	2	3	4	5	6
1	**BP1**	Our sales growth						
2	**BP2**	The market share gains by us						
3	**BP3**	Our sales growth rate						
4	**BP4**	The after-tax return on assets						
5	**BP5**	The net profits after taxes						
6	**BP6**	Our financial liquidity						
7	**BP7**	Our public image						
8	**BP8**	Our customer compliments						
9	**BP9**	Our customer loyalty						
		Please answer the following additional questions to best reflect your organisation	Never	Seldom	Often	Very often	Mostly	Always
			1	2	3	4	5	6
10	**BP10**	To what extent are suggestions on doing things differently made in your organisation?						
11	**BP11**	To what extent is the way work is done in your organisation being changed?						
12	**BP12**	To what extent are new ideas converted into viable business opportunities in your organisation?						

either corporate-wide data or with a class of business. This left no choice but to rely on the responses of management, which was a limitation of this research.

In order to determine the relative importance of each dimension, business performance was considered to be a second order construct, with its four dimensions representing the first order construct, and the first order construct represented by questionnaire items referred to as indicators (see Figures 1 and 2). In Figures 1 & 2, BP refers to the construct business performance, and BP1, BP2, etc. are the indicators representing questionnaire items. Two types of models (molar and molecular) were considered, as the distinction between the two constructs is not always clear-cut. Figure 1 shows the molar model, and Figure 2 the molecular model. In the molar and molecular approaches, business performance is treated as a multidimensional construct of a higher second order. (For more details on the formulation of first and second order constructs, refer to Chin 2000).

In the molar mode, the paths are directed from first order constructs (dimensions of business perfor-

mance) to overall second order constructs (business performance), while the reverse is the case with the molecular model. A molar model is a global or macro presentation of different dimensions of business performance. The molar model represents an emergent construct that is formed (caused) from the first order factors. The relative path weighting at an aggregate level in this model indicates the relative importance of the dimension. In the molecular approach, each dimension represents a separate business dimension that reflects overall business performance. A one-to-one correspondence exists between the overall business performance and each of its dimensions. In contrast to the molar model, which constructs from dimensions, an overall latent construct exists in a molecular model and is reflected (effect) by the first order dimensions. In a molecular model, the path loadings would be an indicator of the relative importance of each dimension in reflecting the overall performance. (For more details on these models, refer to Chin & Gopal 1995).

The molar and molecular models were also tested for the validity and reliability of questionnaire items. The partial least squares (PLS) method was used,
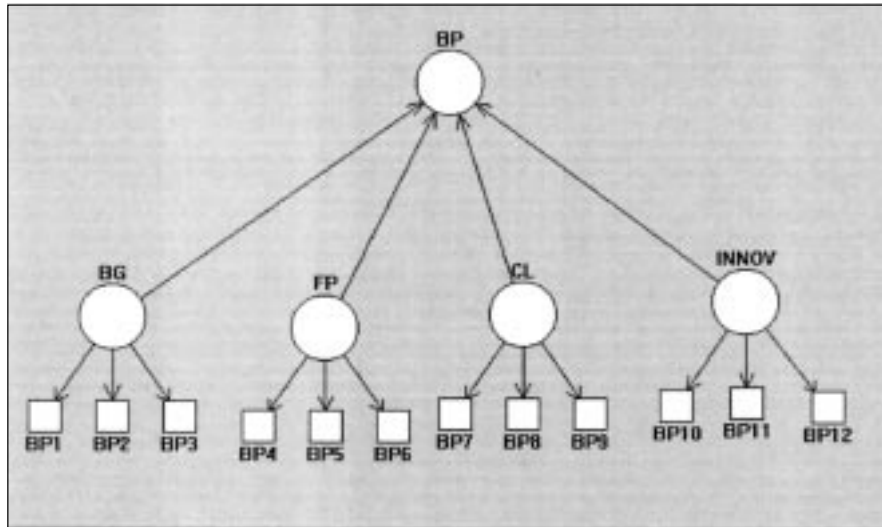
Figure 1: Molar model for business performance (BP). BP1, BP2, etc. represent questionnaire items
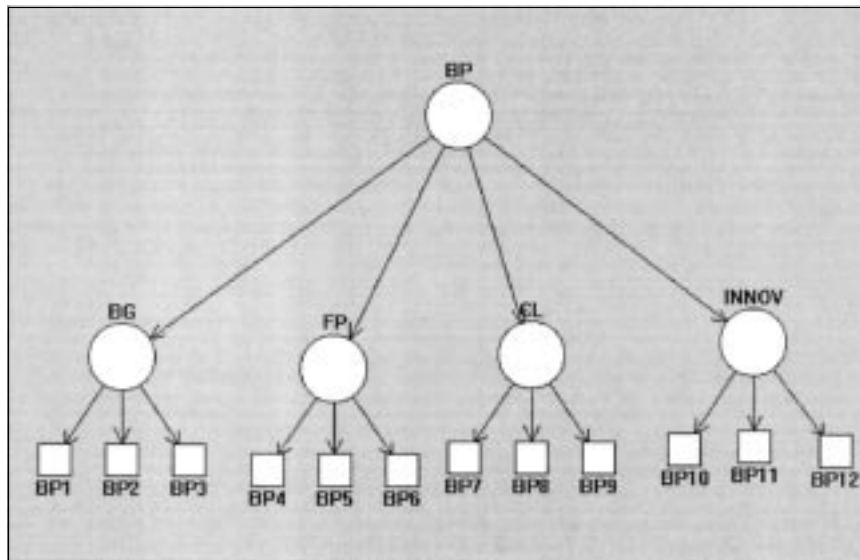

Figure 2: Molecular model for business performance (BP). BP1, BP2, etc. represent questionnaire items

as PLS works by simultaneously assessing the reliability and validity of measures of constructs and estimating the relationships among constructs (Chin 1998).

Banks in South Africa

The Bank Supervision Department of the South African Reserve Bank maintains a list of registered banks, branches and representative offices. The list provides the names of the chief executive officer, postal address, telephone and fax number. A list of e-mail addresses of the top management of banks was collected telephonically. As of March 2002, the

Directory of Banks in South Africa has published information on the following categories of banks on its website:

■ Locally controlled banks: 30 in number (2 under curatorship)
■ Foreign controlled banks: 8 in number
■ Branches of foreign banks: 15 in number
■ Representative offices of foreign banks: 30 in number.

Sample size

The sample size in PLS is the larger of the two possibilities (Chin 1998: 311):

i   the block with the largest number of formative indicators (in other words, the largest measurement equation), or

ii the dependent latent variable (LV) with the largest number of independent LVs influencing it.

If one were to use a regression heuristic of ten cases per predictor, the sample size requirement would be ten times either of (i) or (ii) (Chin 1998: 311). The sample size also has a direct and sizable impact on power (Hair, Anderson, Tatham & Black 1998: 165). Power (statistical power) in multiple regression refers to the probability of detecting a specific level of R2 (or a regression coefficient) as statistically significant at a specified significance level for a specific sample size. In addition to the statistical power, sample size also affects the generalisability of the results by the ratio of observation to independent variables, and a general rule is that the ratio should never fall below 5:1, meaning that there should be five observations for each independent variable in the variate (Hair et al. 1998: 166). Chin & Newsted (1999), using Monte Carlo simulation, infer that with PLS it is possible to successfully estimate and detect path loadings of 0.60 and 0.80 at the small sample size of 20, albeit with reasonably large standard error. However, they also found that increasing the sample size alone does not provide a better approximation to the population value; instead, the number of indicators also has to increase. Their overall results from the Monte Carlo simulation show that the PLS approach can provide information about the appropriateness of indicators at sample sizes as low as 20. Power analysis is useful here in achieving the trade-off between standard error and sample size.

There were 51 banks registered in terms of the Banks Act (as already reported), excluding foreign representative offices and the two under curatorship. The number of banks in the list keeps fluctuating as a result of mergers or liquidations. Telephonic communications with the representative offices of foreign banks indicated that most of them had skeleton staff and were not actively involved in banking in South Africa.

Based on the foregoing findings, a sample size of 20 or more samples was considered acceptable for the purposes of the study.

Data collection

Data were collected using e-mail. Twenty-two responses were obtained from various banks, including ABSA (Associated Banks of South Afri-

ca), BOE, Cape of Good Hope, FNB (First National Bank), Marriott, Nedcor, Imperial and Teba banks. The responses covered more than 90% of the commercial banking sector in South Africa. All the e-mails were addressed to the chief executive officer of the bank, but some of them responded through their deputies.

Results

PLS version 3.00, build 1016 (1993–2003) was used to carry out the analysis.

Although the PLS method analyses measurement and structural estimates together, the PLS model is analysed in two stages: (i) the assessment of the reliability and validity of the measurement model, and (ii) the assessment of the structural model. The sequence ensures reliable and valid measures of constructs before attempting to draw conclusions on the relationships among the constructs (Barclay, Thompson & Higgins 1995: 295).

The measurement model is assessed by examining: (i) individual item reliability, (ii) internal consistency, and (iii) discriminant validity of the constructs (Barclay et al. 1995: 295).

In PLS, individual item reliability is assessed by examining the loading, or simply the correlation, of the measures with their respective constructs. An item loading of 0.707 or more implies more shared variance between the construct and its measures than error variance (Carmines & Zeller 1979).

Internal consistency for a given block of indicators, developed by Fornell & Larcker (1981) as a measure of reliability, is computed as the sum of the loadings, all squared, divided by the sum of the loadings, all squared, plus the sum of the error terms. This ratio should be equal to at least 0.70. This measure is similar to Cronbach's alpha as a measure of internal consistency. Symbolically, the measure is represented as:

Internal consistency for a given block of indicators = $(Sum\ )^2\ /[(Sum\ )^2 + Sum\ var\ (\varepsilon)]$

Where: ε is error or residual variance = $1-\ ^2$ and represents path loading.

The ratio should be equal to at least 0.7.

Discriminant validity indicates the extent to which a given construct is different from other constructs. One criterion for adequate discriminant validity is that a construct should share more variance with its measures than it shares with other constructs in the model. To assess discriminant validity, Fornell &

Larcker (1981) suggest the use of average variance extracted (AVE). AVE is calculated using the formula:

$$AVE = \frac{(Sum\ \lambda)^2}{(Sum\ \lambda)^2 + Sum\ var\ (\varepsilon)}$$

Where: ε is error/residual variance = $1 - \lambda^2$ and λ represents path loading

For discriminant validity of the construct, the square root of AVE (as obtained from the preceding formula) should be greater than the variance shared between the construct and other constructs in the model (in other words, the correlation between the two constructs), and for convergent validity of the construct, the decision rule is that AVE should be greater than 0.5, which means that 50% or more of the variance of indicators should be accounted for.

Assessment of the structural model in PLS is done by assessing the statistical significance of the path coefficients. T-values for path loading are obtained using jackknifing or bootstrapping. Jackknifing and bootstrapping are re-sampling techniques. The use of jackknifing, as opposed to traditional t-tests, allows the testing of the significance of parameter estimates from data that are not assumed to be multivariate normal (Barclay et al. 1995: 298). R^2, the coefficient of determination, is obtained for the dependent variable. It refers to the variance explained by the construct.

In order to determine item–construct loading, a factor analysis was conducted in PLS using the items and constructs with no relationship between the constructs. The result of the factor analysis is reported in Table 4.

Examination of factor loadings in Table 4 suggests that there was no major multicollinearity between the indicators, as the loading of the indicator with respect to its construct is greater than the other constructs. For example, BP9 has a factor loading of 0.878 with its corresponding construct customer loyalty, while its loading with other constructs (such as business growth and financial performance) is much lower. However, indicators BP1 to BP6 show some degree of correlation with both constructs, namely business growth and financial performance. The factor loadings of the indicators also suggest that the 11 indicators (BP1 to BP12, with the exception of BP12 with item loading 0.286) are valid indicators and can be used with confidence for measuring the various dimensions they represent. BP12 ('to what extent are new ideas converted into viable business opportunities in your organisation?') might not necessarily result from innovativeness but for other reasons. The factor loadings for BP6 and BP7 were not very much lower than 0.707 and were not dropped.

To determine internal consistency and discriminant validity, the constructs were joined in the model, and the model was run as a molecular model. The results are shown in Table 5, which shows the correlation matrix for the construct where the diagonal of this matrix is the square root of AVE.

The results shown in Table 5 suggest good internal consistency, and convergent and discriminant validity for all the constructs except innovativeness

Table 4: The factor loading and cross loading of measures for the construct business performance

	Business growth	Financial performance	Image and customer loyalty	Product service innovation
BP1	**0.948**	*0.735*	0.304	-0.253
BP2	**0.945**	*0.701*	0.361	-0.390
BP3	**0.803**	*0.516*	0.585	0.047
BP4	*0.604*	**0.869**	0.251	-0.388
BP5	*0.567*	**0.833**	0.210	0.000
BP6	*0.527*	**0.591**	0.139	-0.191
BP7	0.558	0.435	**0.581**	0.281
BP8	0.364	0.201	**0.895**	0.055
BP9	0.240	0.082	**0.878**	-0.120
BP10	-0.119	-0.166	0.042	**0.883**
BP11	-0.341	-0.346	0.120	**0.823**
BP12	0.091	0.160	-0.169	**0.286**

Table 5: Mean, standard deviation, internal consistency and discriminant validity constructs BP

	No. of items	Mean	SD	Fornell α	Correlation of construct and AVE				AVE
					BG	FP	CL	INNOV	
BG	3	11.64	3.27	0.92	**0.90**				0.81
FP	3	12.45	2.99	0.81	*0.73*	**0.77**			0.59
CL	3	12.36	2.56	0.82	0.53	0.35	**0.78**		0.61
INNOV	3	11.45	1.74	0.61	0.36	0.36	-0.20	**0.69**	*0.47*

(INNOV), with AVE less than 0.50. However, the financial performance construct also shares high variance (0.73 in Table 5) with the business growth construct, and the indicators (BP4 to BP6) of the financial performance construct also show some degree of multicollinearity with business growth indicators (see Table 4). This suggests that the two constructs could be combined into one construct, as the difference between the two is not distinct. It could be said that these two constructs are essentially a single construct for all practical purposes. However, the numeric difference calls for keeping the two constructs separate in this study.

Figures 3 and 4 show the results of the molecular and molar model. Bootstrap re-sampling was performed to examine the statistical significance of path loadings in the molecular model and weights in the molar model.

Table 6 shows the results of the analysis. The path loadings and weights suggest the relative importance of each dimension.

The results in Table 6 suggest that the paths joining customer loyalty and innovation were not statistically significant.

Table 6: The path, loading, weights and t-values for the construct business performance

Path	Loading	Weights	T-values
BP—BG	0.950		22.75**
BP—FP	0.865		12.83**
BP—CL	0.623		1.94
BP—INNOV	0.364		1.02
BG—BP		0.527	9.654**
FP—BP		0.351	4.48**
CL—BP		0.250	1.89
INNOV—BP		0.107	0.831

** *Statistically significant at p< 0.001*

Finally, the results of the analysis in Tables 4, 5 and 6 suggest the following:

■ Eleven indicators (BP1 to BP12, with the exception of BP12) of business performance, representing four dimensions, were validated using factor analysis in PLS. These indicators can be used with confidence for measuring the dimensions they represent.

■ Three constructs, namely business growth (BG), financial profitability (FP) and customer loyalty (CL), showed good internal consistency and discriminant validity.

■ The two dimensions of business growth and financial profitability showed a high degree of correlation, indicating that business growth is aligned with profit for the sample of the study.

■ The paths joining customer loyalty and innovation were not statistically significant. This suggests that these two dimensions were not valid dimensions for measuring business performance for the sample of the study.

Conclusion

The high degree of positive correlation between subjective and objective measures established by researchers (Dess & Robinson 1984; Dawes 1999) suggests that practitioners and researchers could make use of subjective measures, bearing in mind the limitation that perfect correlation between the two is difficult to obtain in practice. However, precautions should be taken to check the correlation between subjective and objective measures, wherever possible.

Most researchers consider business performance to be multidimensional. The results of this study suggest that the non-financial dimensions (namely, image and customer loyalty, and product service innovation) are not valid dimensions for measuring business performance, while the other two dimensions (namely, business growth and profitability)
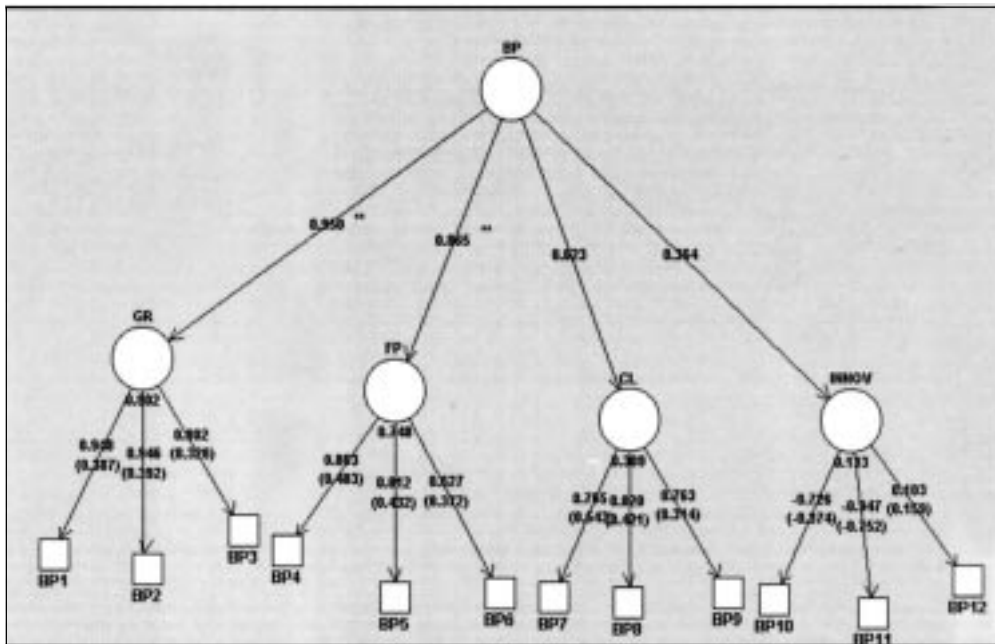
Figure 3: Molecular model showing the paths and loadings, **significant paths at P<0.001
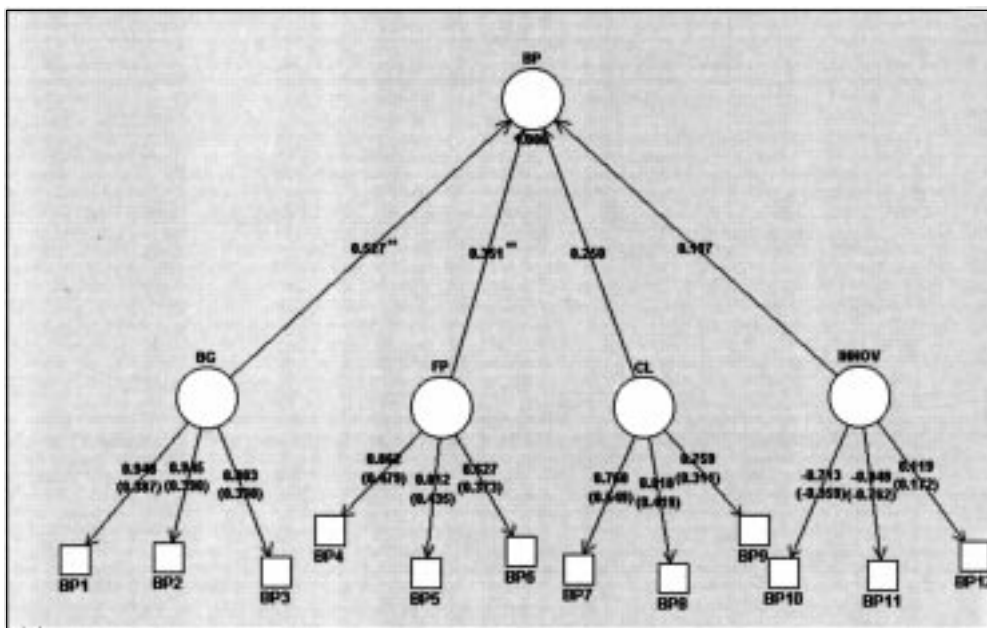

Figure 4: Molar model showing the paths weights, **significant paths at p<0.001

show a high degree of correlation. This indicates that business growth is aligned with profitability, that growth for profitability is a major concern, and that profitability still remains the key measure of business performance in the South African banking sector. Parameters such as customer loyalty and innovativeness are not regarded as important for business performance, although these could be pressing issues for banks.

References

Anderson, T.J. 2000. 'Strategic planning, autonomous actions and corporate performance', *Long Rang Planning,* 33: 184–200.

Anderson, T.J. 2001. 'Information technology, strategic decision making approaches and organizational performance in different industrial settings', *Journal of Strategic Information Systems,* 10.

Ansoff, H.I. & Sullivan, P.A. 1993. 'Optimizing profitability in turbulent environments: a formula for strategic success', *Long Range Planning,* 26(5): 11–23.

Ayadi, O.F., Adebayo, A.O. & Omolehinwa, E. 1998. 'Bank performance measurement in a developing economy: an application of data envelopment analysis', *Managerial Finance,* 24 (7).

Barclay, D., Thomson, R. & Higgins, C. 1995. 'The Partial Least Squares (PLS) approach to causal modelling, personal computer adoption and use as an illustration,' *Technology Studies,* 2(2).

Bergeron, F., Raymond, L. & Rivard, S. 1999. 'The concept of fit in information systems research', Available from: *www.fsa.ulaval.ca/rd*. Accessed: 19 November 2001.

Biddle, G.C. 1998. 'Economic value added: some empirical evidence', *Managerial Finance,* 24(11).

Carmines, E.G. & Zeller, R.A. 1979. 'Reliability and validity assessment', Sage University Paper Series on Qualitative Applications in the Social Sciences, No. 07-017. California: Sage.

Chin, W.W. 1998. 'The partial least square approach to structural equation modeling', In Marcoulides, G.A. (ed.), *Modern Methods for Business Research Modeling.* New Jersey: Lawrence Erlbaum.

Chin, W.W. 2000. 'Partial Least Squares for researchers: An overview and presentation of recent advances using the PLS approach.' Available from: *http://disc-nt.cba.uh.edu/chin/index.html*.

Chin, W.W. & Gopal, A. 1995. 'Adoption intention in GSS: Relative importance of beliefs', *The Data Base for Advances in Information Systems,* 26 (23).

Chin, W.W. & Newsted, P.R. 1999. 'Structural equation modeling analysis with small samples using partial least squares', In Hoyle, R.H. (ed.), *Statistical Strategies for Small Sample Research.* California: Sage.

Cragg, P.C, King, M. & Hussain, H. 2002. 'IT alignment and firm performance in small manufacturing firms', *Journal of Strategic Information Systems,* 11.

Croteau, A.M. & Bergeron, F. 2001. 'An information technology trilogy: business strategy, technological deployment and organizational performance', *Journal of Strategic Information Systems,* 10.

Dawes, J. 1999.'The relationship between subjective and objective company performance measures in market orientation research: further empirical evidence'. Available from: *http://marketing-bulletin.massey.ac.nz*. Accessed: 19 April 2002.

Dess, G.G. & Robinson, R.B. 1984. 'Measuring organizational performance in the absence of objective measures: the case of the privately held firms and conglomerate business unit', *Strategic Management Journal,* 5.

Durand, R. & Coeurderoy, R. 2001. 'Age, order of entry, strategic orientation, and organizational performance', *Journal of Business Venturing,* 471–494.

Fornell, C. & Larcker, D. 1981. 'Evaluating structural equation models with unobservable variable and measurement error', *Journal of Marketing Research,* 18.

Gopalakrishnan, S. 2000. 'Unraveling the links between dimensions of innovation and organizational performance', *Journal of High Technology Management Research,* 11(1).

Hair, J.F., Anderson, R.E., Tatham, R.L. & Black, W.C. 1998. *Multivariate Data Analysis* (5th edition). New Jersey: PHI.

Kaplan, R.S. & Norton, D.P. 1996. *'The Balanced Scorecard: Translating Strategy into Action'.* Boston, MA: Harvard Business School.

Mehra, A. 1996. 'Resource and market based determinants of performance in the U.S. banking industry', *Strategic Management Journal,* 17: 307–322.

Neely, A., Adams, C. & Crowe, P. 2001. 'The performance prism in practice', *Measuring Business Excellence,* 5(2). Available from: Emerald Full text. Accessed: 19 April 2002.

Papke-Shields, K.E. & Malhotra, M.K. 2001. 'Assessing the impact of the manufacturing executive's role on business performance through strategic alignment,' *Journal of Operations Management,* 19.

Parkan, C. & Wu, M.L. 1999. 'Measurement of the performance of an investment bank using the operational competitive rating procedure', *International Journal of Management Science,* 27: 201–217.

Peek, J., Rosengren, E.S. & Kasirye, F. 1999. 'The poor performance of foreign bank subsidiaries: were the problems acquired or created?', *Journal of Banking & Finance,* 23.

Rogers, P.R., & Bamford, C.E. 2002. 'Information planning process and strategic orientation: The importance of fit in high-performing organizations', *Journal of Business Research,* 55.

Sathye, M. 2001. 'Efficiency of banks in a developing economy: the case of India'. Available from: http://economics.anu.edu.au/asrc/novcon2001/milindsathye-pdf. Accessed: 19 April 2002.

Staden, C.J. 1998. 'The usefulness of the value added statement in South Africa', *Managerial Finance,* 24(11).

Sherman, H.D. & Gold, F. 1985. 'Bank branch operating efficiency, evaluation with data envelopment analysis', *Journal of Business and Finance,* 9.

Stern, J.M. 1990. 'One way to build value in your firm, à la executive compensation', *Financial Executive.* 6(6). Available from: General Business File, Unisa library. Accessed: 8 April 2002.

Stern, J.M. & Shiely, J.S. 2001. 'Roadblocks to the embrace of EVA. (Economic Value Added)', *Direc-*

tors and Boards, 25. Available from: General Business File, Unisa library. Accessed: 8 April 2002.

Thanassoulis, E., Boussofiane, A. & Dyson, R.G. 1996. 'A comparison of data envelopment analysis and ratio analysis as a tool for performance assessment', Omega International Journal of Management Science, 24(3).

Venkatraman, N. 1989. 'Strategic orientation of business enterprises: the construct, dimensionality, and measurement', Management Science, 35(8).

Woodside, A.G. Sullivan, D.P. & Trappey, R.J. 1999. 'Assessing relationships among strategic types, distinctive marketing competencies, and organization performance', Journal of Business Research, 45.

Yeh, G.J. 1996. 'The application of Data Envelopment Analysis in conjunction with financial ratios for bank performance evaluation', Journal of Operational Research Society, 47.

Annexure 1

Please indicate your best estimate of your bank's position on average relative to that of close competitors over the past two years. Select only one possibility per item and use a star (*) or any other preferred symbol in completing the questionnaire.

Sl. No.	Please indicate your best estimate of your banks position on average relative to that of close competitors over the past two years.	Much worse than competitors					Much better than competitors
		1	2	3	4	5	6
1	Our sales growth						
2	The market share gains by us						
3	Our sales growth rate						
4	The after-tax return on assets						
5	The net profits after taxes						
6	Our financial liquidity						
7	Our public image						
8	Our customer compliments						
9	Our customer loyalty						
	Please answer the following additional questions to best reflect your organisation	Never	Seldom	Often	Very often	Mostly	Always
		1	2	3	4	5	6
10	To what extent are suggestions on doing things differently made in your organisation?						
11	To what extent is the way work is done in your organisation being changed?						
12	To what extent are new ideas converted into viable business opportunities in your organisation?						