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Residential property development and financial ratio analysis: a South African perspective

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Abstract

Financial statements are read, analysed and interpreted by a diverse group of interested parties, among whom are owners, directors and managers who read financial statements to utilise the information for planning and control purposes. It is imperative that they uncover underlying or evolving trends and/or other salient features in order to assess the business' progress towards achieving its strategic goals (as determined through its planned objectives). Financial ratio analysis promises to be a simple but effective way of analysing financial statements for interpretation. It is, however, not a 'complete' method of analysis as it is directed at measuring financial objectives only.

The 'traditional' method of analysis and interpretation of financial statements evolved over a period of approximately a century (mainly due to major developments in management concepts). Thereafter industrious researchers explored the possibility of effecting changes to these existing methods, formulae and uses of financial ratios to explore their predictive abilities. It was assumed to be an inherent attribute of ratio analysis. Although there is no real consensus, the conclusion is that failure-or-success-prediction-models suffer from poor predictive abilities. Therefore this study was directed at the principles of applying the 'traditional' approach to financial ratio analysis. The references to the 'modern' models, techniques and their applications are made for contextual purposes only.

The aim of this study is twofold. The first aim is to determine whether residential property developers apply financial ratio analysis in analysing the financial information contained in their financial statements. Developers indicated that they do use ratio analysis for this purpose. The second aim is to illustrate how important the acquisition of knowledge and understanding of the basic principles and techniques of financial ratio analysis is to non-accountants (such as the average property developers and built environment professionals) in applying financial ratio analysis in their decision-making. Section 8 in this study serves as guideline to practitioners, based on results and conclusions of the empirical study of the article.

There is no internationally accepted theoretical framework or standard for applying and using financial ratio analysis to assist managers in the assessment of business performance. This should not create the perception that ratios are

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merely an accumulation of tools and techniques. Each ratio is an integral link in a chain of financial ratios.

Managers in the built environment should be encouraged to gain knowledge and apply financial management tools and techniques to enhance their financial management expertise. Non-financial managers and directors can no longer avoid financial management responsibilities by deferring these to the financial professionals. Rather, managers and directors need to adopt an attitude of the buck stops here.

Keywords: Property development, ratio analysis, South Africa

Abstrak

Finansiële state word gelees, ontleed en vertolk deur 'n diverse groep belanghebbendes. Een groep is die eienaars, direkteure en bestuurders wat finansiële state bestudeer ten einde die inligting aan te wend vir beplanning- en kontrole-doeleindes. Dit is van uiterste belang om onderliggende of ontlukende tendense of ander kenmerkende eienskappe te identifiseer, ten einde te bepaal of 'n besigheid se strewe na bereiking van sy strategiese mylpale, soos vasgestel deur die onderneming se doelwitte, bereik word. Finansiële verhoudingsontleding belooft om 'n eenvoudige maar effektiewe metode te wees om ontledings vir die vertolking van finansiële state te doen. Dit is egter nie 'n volledige metode van prestasie meting, ontleding, interpretasie en bestuur nie, aangesien dit slegs meting van finansiële doelwitte aanspreek.

Oor die tydperk van ongeveer 'n eeu het die metode van ontleding genaamd 'tradisioneel' ontstaan (hoofsaaklik weens vooruitgang in bestuurstechnieke). Daarna het navorsers die moontlikheid ondersoek om die voorspellingsmoontlikhede van verhoudingsontleding te ontgin deur geringe veranderings aan die 'tradisionele' metodes aan te bring. Daar is nie algemene ooreenstemming nie, maar dit blyk die gevolgtrekking te wees dat mislukking-en-sukses-modelle min voorspellingswaarde inhou. Daarom was hierdie studie daarop gerig om die toepassing van die 'tradisionele' metode van ontleding van finansiële state te ondersoek. Verwysing na die 'moderne' modelle, tegnieke en hulle toepassing word slegs gemaak vir kontekstuele doeleindes.

Die doel van die studie is tweevoud. Eerstens om te bepaal of residensiële eiendomsontwikkelaars verhoudingsontleding gebruik in die vertolking van hulle ondernemings se resultate. Eiendomsontwikkelaars het aangetoon dat hulle inderdaad van finansiële verhoudingsontleding gebruik maak. Tweedens om te illustreer hoe belangrik kennis en begrip van finansiële verhoudingsontleding asook die basiese beginsels en tegnieke van verhoudingsontleding vir nie-finansiële bestuurders (soos die gemiddelde eiendomsontwikkelaar en bou-omgewing professionele persone) is in die toepassing van finansiële verhoudingsontleding met betrekking tot besluitneming. Punt 8 van die artikel word daaraan gewy om advies te verskaf aan gebruikers van verhoudingsontleding in die bou-omgewing.

Daar bestaan geen internasionaal aanvaarde teoretiese raamwerk of standaard vir die gebruik en toepassing van finansiële verhoudingsontleding om bestuurders te ondersteun in die evaluering van hulle ondernemings se resultate nie. Dit moet egter nie die indruk skep dat verhoudings bloot 'n versameling van verhoudings en tegnieke is nie; elke verhouding is 'n integrale skakel in 'n ketting van verhoudings.

Bestuurders in die bou-omgewing behoort aangemoedig te word om die nodige kennis in te win en toepassings van gebruike en tegnieke van verhoudingsontleding te beoefen aangesien dit die enigste manier van verkryging van ondervinding is. Nie-finansiële bestuurders durf nie langer die finansiële bestuursverantwoordelikhede vermy deur dit aan rekeningkundige persone oor te dra nie. Bestuurders en direkteure moet 'n houding van die verantwoordelikheid eindig hier inneem.

Sleutelwoorde: Eiendomsontwikkeling, ratio analise, Suid-Afrika

1. Introduction

Whittington(1980: 219) defined the basic assumption of ratio analysis as that of:

proportionality, i.e. it is assumed that a proportionate relationship exists, or ought to exist, between the two variables whose ratio is calculated.

McDonald & Morris(1984: 89) observed that:

ratio analysis has been popularized not by its structural validity, but by its convenience.

Coetzee, Stegmann, Van Schalkwyk, & Wesson (2002: 199) regard ratio analysis as:

... the most noted and useful tool for analysers of financial statements. Even so, it is sometimes misunderstood and its importance underestimated.

Ratio analysis lacks explicit theoretical structure and the user of ratios is required to rely upon the authority of an analyst's experience. Ratio analysis is replete with untested assertions about which ratios should be used and what their proper levels should be. In general, the expected relationships of various ratios have not been formulated. The major part of ratio analysis literature consists of instructions on how to compute ratios (Horrigan, 1968). This has not changed since Horrigan made the observation in 1968.

Horrigan(1968) indicated the basic ratio shortcoming and the need that exists for analytical devices which will enable analysts to compare financial statements between firms and over time periods. Ratio analysis is a simple, quick method of comparison. Available evidence suggests that ratios do have predictive value, even if only in respect of financial distress. Horrigan suggested that the shortcomings of ratio analysis be remedied and predicted that ratios would play an important role in the future. Ratios should at least be useful to the small firm for internal analyses and to most external analysts for investment and credit evaluations.

McKosker (1998) stated that when ratios are interpreted with care it allows managers to concentrate resources in the correct areas. Good management and appropriate accounting systems accompanied by relevant controls is needed to maintain direction or correct the lack thereof. Gitman (2003) cautioned that financial ratios should be meaningful and there should be a logical relationship between the units being used. According to Brigham & Gapenski (1996: 47), ratio analysis is useful as a starting point for planning actions that will influence the future course of events. Chabotar (1989) stated that by itself, a ratio almost never provides sufficient evidence for panic or pride and there is much about an organisation that cannot be quantified by means of ratio analysis, such as leadership and reputation. Ross (2005) pointed out that financial statement information is subject to legitimate estimates, timing decisions and illegitimate manipulation. Adrian (1979: 123) states that each firm and the industry in which it performs is unique as to its product, objectives and financial structure resulting in the fact that each firm is unique to the values of its financial ratios. This can result in a negative assessment of a specific firm, although it may have a sound financial structure.

This led to the question whether residential property developers apply financial ratio analysis in analysing the financial information contained in their financial statements? The hypothesis that residential property developers do apply financial ratio analysis in practice and decision-making will be tested. This article aims to illustrate the importance of knowledge regarding financial ratio analysis as applied by residential property developers. Ratio analysis evolution seems to move toward a structure as illustrated in Figure 1. This structure forms the basis of the empirical study discussed hereafter.

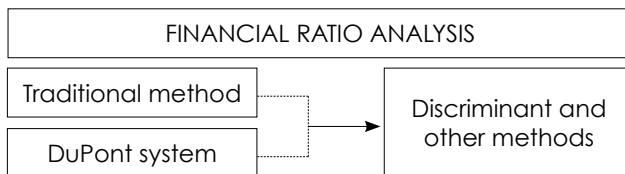


Figure 1: Spectrum of ratio analysis available

2. Traditional ratio analysis

According to Gitman (2003), financial ratios can be divided into five basic categories. Liquidity, activity and debt ratios primarily measure risk. Profitability ratios measure return. Market ratios capture both risk and return. Figure 2 illustrates this concept.

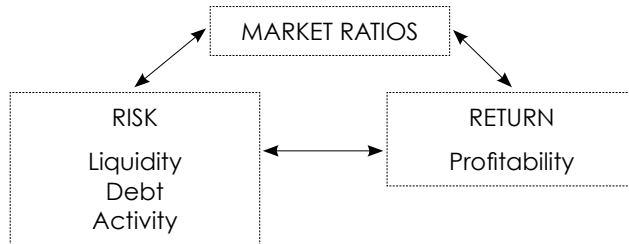


Figure 2: Traditional ratios

Liquidity refers to a firm's ability to meet its obligations over the short term. This means to have the necessary cash available to pay for costs and expenses and to make payments due to creditors. The availability of adequate levels of cash is measured by the Current Ratio and refined by the Quick (Acid-Test) Ratio.

A company's ability to survive over the long term is related to its debt position. The debt position of a firm indicates the amount of non-owner or non-self-generated funds used by the business. In general, the more debt a firm uses, the higher the risk. Due to the influence of financial leverage, debt could actually increase the return to owners, but at the risk of possible insolvency should the company be unable to service its debt. Debt or Solvency Ratios are the Debt Ratio, Times Interest Earned Ratio and Fixed-Payment Coverage Ratio.

Activity Ratios measure the speed (in terms of days or number of times per year) with which assets and liabilities are converted into cash. Activity ratios are Inventory Turnover Ratio, Average Collection and Payment Periods Ratios and Total Asset Turnover Ratio. This can be considered a measure of assurance for uncertain liquidity ratios.

Profitability ratios evaluate a firm's profits by expressing them in terms of level of income (turnover), certain levels of assets, as well as the owners' investment. Profitability Ratios are Gross Profit Margin, Operating Profit Margin, Net Profit Margin, Earnings per Share (EPS), Return on Total Assets (ROA) and Return on Common Equity (ROE).

Market Ratios relate the firm's market value measured by its current share price to certain accounting values. These ratios give an indication on what investors in the marketplace feel the firm is doing in terms of risk and return. Market Ratios are Price/Earnings (P/E) Ratio and Market/Book (M/B) Ratio.

According to Salmi, Virtanen & Yli-Olli (1990), financial ratios are widely used for modelling purposes by both practitioners and researchers. Many distinct areas of research involving financial ratios can be discerned. They stated that historically one can observe several major themes in the financial analysis literature. There is overlapping in the observable themes, and these do not necessarily coincide with what theoretically might be the best founded areas. Salmi & Martikainen (1994) developed the above theme concept further. Where both the numerator and the denominator are market based they suggested the use of the term 'market-based ratio' and the use of the term 'financial ratio' for ratios and other similar data derived from financial statements, with and without the market-based element.

Traditional ratios are part of a structure as illustrated in Figure 2. Financial ratios are not a random group of calculations. A clear and logic sequence, interdependence and reliability exist in their compilation. Figure 2 illustrates the structured concept of ratios.

3. A structure for traditional ratio analysis

Gitman(2003: 53), Melicher (2006: 154), Coetzee *et al.* (2002: 199) and Faul, Pistorius, Van Vuuren, Vorster, & Swaneveldter (1997: 806-807) roughly agree on traditional ratios as illustrated in Figure 2. The most important and often overlooked wisdom contained within the diagram can be illustrated by comparing the diagram with a book. A book contains the complete story or message, so does the diagram. If each ratio is regarded as a chapter within the book, then without any one of them the message is not only different; but also incomplete. One ratio, like one chapter, cannot be expected to convey the full story or message that unfolds in the book as a whole.

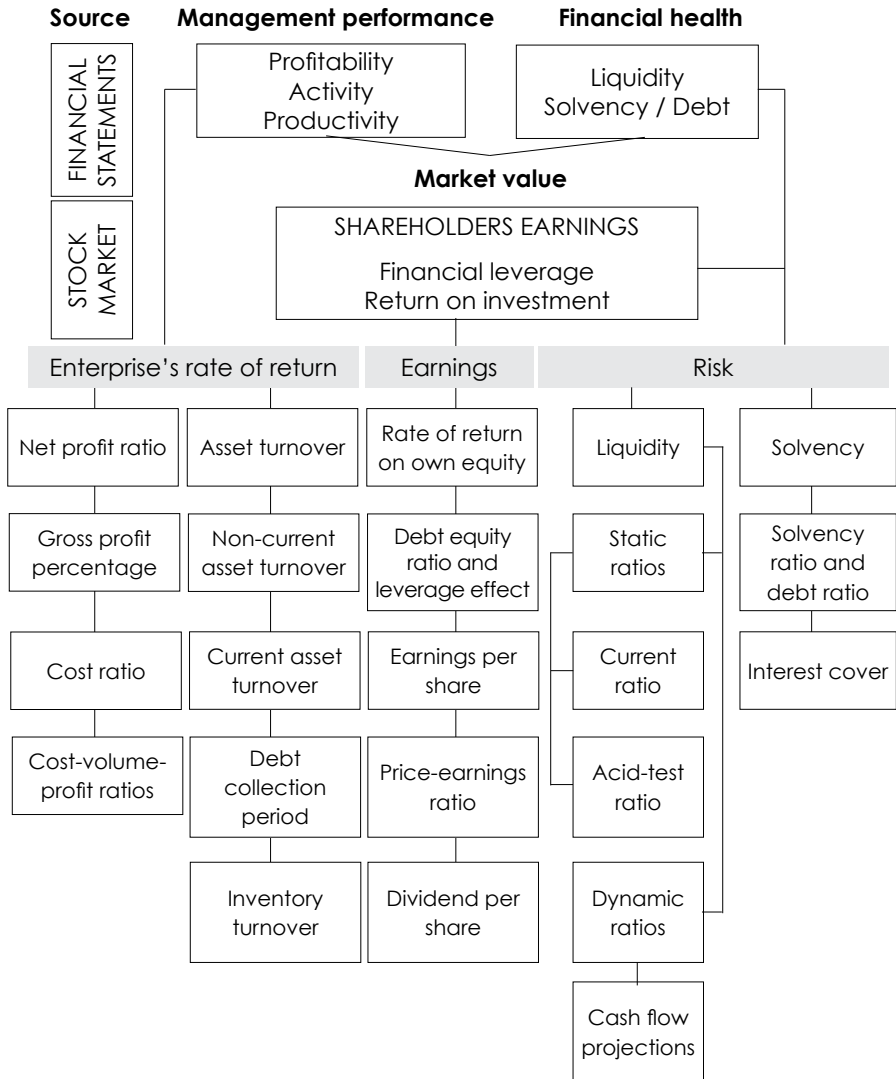


Figure 3: Illustration of ratios in groupings
Source: Faul *et al.* 1997: 807 adapted

4. The DuPont method of analysis

The traditional method is better illustrated and understood alongside the DuPont method of analysis which includes the financial statements. The DuPont system evolved from the traditional method and, by focusing on certain key ratios, the DuPont method is in fact an alternative presentation of the traditional method. Melicher (2006: 175) defined DuPont as:

The technique of breaking down return on total assets (ROA) and return on equity (ROE) into their component parts.

ROA is calculated as: Net profit margin X Total asset turnover

ROE is calculated as: $\frac{\text{Net income}}{\text{Shareholders equity}}$ or ROA X FLM

The DuPont Corporation needed a method of performance measurement and the 'DuPont identity' method proved to be the answer. The distinguishing aspect of this analysis is that it results in a measure of an entity's profitability, namely, ROE. The DuPont model is a structured analytical technique often used in practice. The model assumes that the single aim of a business is to increase the return of shareholders' funds (thus maximise ROE). The model combines risk and return as both sides are linked to the ROE.

According to Gitman (2003), DuPont combines the net profit margin, which measures the firm's profitability in sales, with total asset turnover, which indicates how efficiently the firm has used its assets to generate sales. The product is return on total assets (ROA). The second step is the modified formula and relates the firm's return on total assets (ROA) to its return on common equity (ROE) which is calculated by multiplying the return on total assets (ROA) by the financial leverage multiplier (FLM), the ratio of total assets to common equity.

Angell & Brewer (2003: 1) commented on "the deficiency of the DuPont system of analysis in most textbooks and provides an alternative that more accurately aligns the analytical measures to the factors affecting a firm's return on equity". They added net profit available to the owners to the equation and labelled it "Net Leverage Multiplier".

Penman (1991) concluded that the ROE is best interpreted as an effective profitability measure, not a risk measure. By contrast, De Wet & Du Toit (2007: 59) determined as follows when the return on equity (ROE) is weighed up against the present favourite, economic value added (EVA): "it is clear that the debate about the effectiveness of traditional accounting performance measures, as well as the search for the real drivers of shareholder value, will continue and increase in intensity. Although ROE has some appeal because it links the income statement (earnings) to the balance sheet (equity), it has some serious flaws as a measure of performance".

Figure 4 illustrates that ROE (a gauge of profit-generating efficiency) is affected by:

- Operating efficiency (net profit margin, indicated as 1 in Figure 4)
- Asset use efficiency (total asset turnover, indicated as 2 in Figure 4), and
- Financial leverage (financial equity multiplier, indicated as 5 in Figure 4).

The DuPont method of analysis (illustrated in Figure 3) starts with the components of the financial statements and works towards the ROE. The upper portion of the diagram summarises the income statement in income and expense activities and the lower portion of the diagram summarises the balance sheet in net balance sheet activities. It is important to note that step one determines the Return on Total Assets (ROA) ([4] in Figure 4: calculated as [2] on the Figure divided by with [3] on the Figure) and the second step the multiplication of ROA with the Financial Leverage Multiplier (FLM) ([5] in Figure 4) to calculate Return on Equity (ROE) ([6] in Figure 4). It is otherwise calculated as Profit available to the Owners ([1] in Figure 4) divided by Owners' Equity.

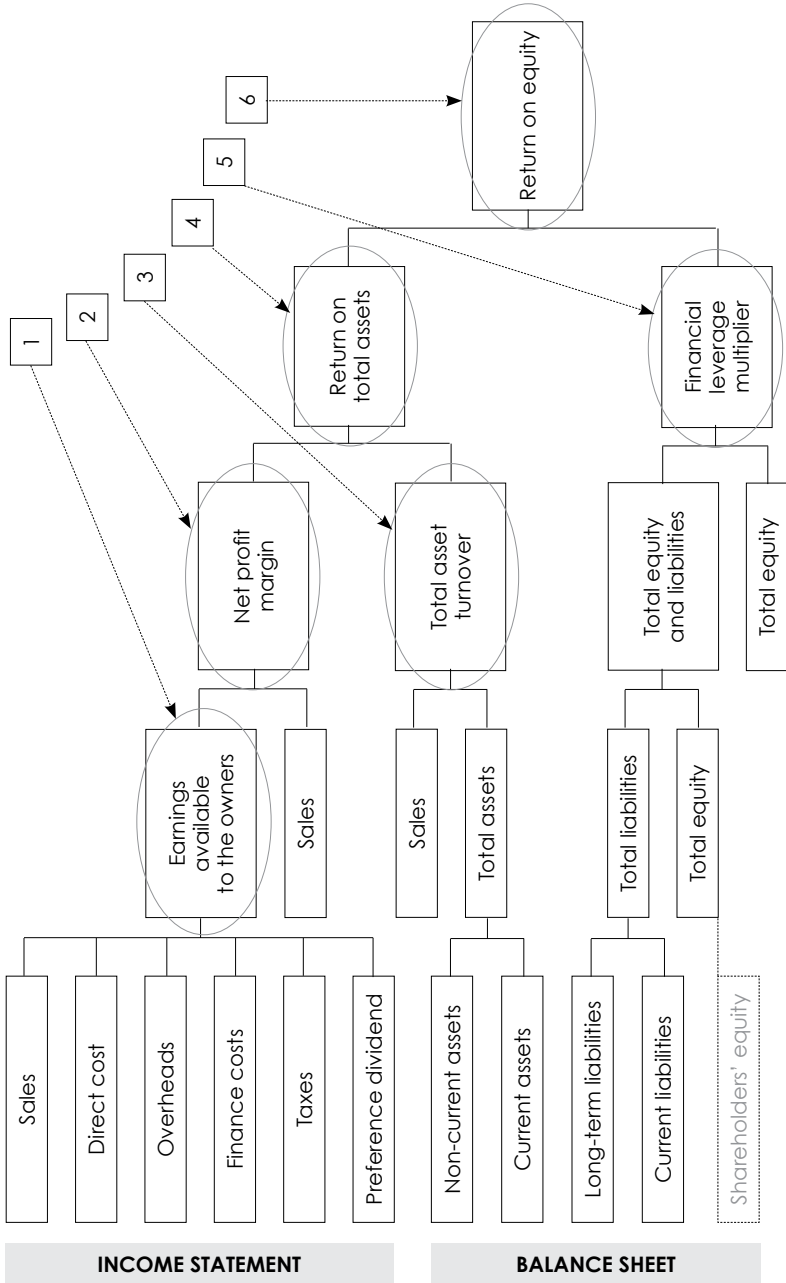


Figure 4: DuPont system of analysis
Source: Meitner (2006: 176) & Gitman (2003: 140) Adapted

5. Discriminant and other methods of ratio analysis

According to Joy & Tollefson (1975: 723), discriminant analysis research has substantially increased; however, these studies have experienced problems with interpretation. They remarked that “the conclusions and generalizations that can be drawn from such studies are frequently tenuous and questionable.”

Kaufmann, Gadmer & Klett (2001: 1); Feroz, Kim, & Raab (2003); Gattoufi, Oral & Reisman (2004), and Thannasoulis, Boussofiame & Dyson (1996) researched the method of analysis called Dynamic Financial Analysis (DFA). Kaufmann *et al.* (2001: 1) remarked that DFA combines so many economic and mathematical concepts and methods that “it is almost impossible to identify and describe a unique DFA methodology.”

Gallizo & Salvador (2003: 267) contributed to “the understanding of the behaviour of financial ratios by means of a Hierarchical Bayesian Analysis of the partial adjustment model of financial ratios.” Seay, Pitts & Kamery (2004: 9), on the other hand, sought to “enhance the understanding of the ratio adjustment phenomenon by investigating the association between certain firm-specific factors and the rates of ratio adjustment and of expectation (target) adjustment.”

Chen & Shimerda (1981: 51) undertook an empirical analysis of useful financial ratios. They concluded that there is one recurring question in the use of financial ratios: “Which ratios, among the hundreds that can be computed easily from the available financial data, should be analyzed to obtain the information for the task at hand?”

The existing controversy and contradictions in the constant search for a fixed set of ratios and benchmarks are best explained by the following quotations. These clearly indicate a diverse but honest opinion of what financial ratios are and/or what they are not.

- According to Altman (1968: 589), academics appear to be moving toward the elimination of ratio analysis as an analytical technique in assessing the performance of the business enterprise, and theorists downgrade arbitrary rules of thumb, such as company ratio comparisons, widely used by practitioners. “Although attacks on the relevance of ratio analysis emanate from many esteemed members of the scholarly world, does it mean we bridge the gap between traditional ratio ‘analysis’ and the more rigorous statistical techniques or rather sever the link”.

- Deakin (1976: 90) stated that the recent application of advanced statistical techniques to the traditional financial ratio analysis of companies has raised some questions concerning the usefulness of these ratios for persons external to the firm.
- Eisenbeis (1977:895) stated that there exist pitfalls in the application of discriminant analysis in business, finance and economics. "The applied discriminant analysis papers that have appeared in the business, finance, and economics literature to date, most have suffered from methodological or statistical problems that have limited the practical usefulness of their results".
- Laínez & Callao (2000: 65) concluded that "Business activity has acquired an international dimension and financial information needs to be understood both inside and outside its country of origin".

Regarding property companies Barkham (1997: 441) remarked that they are a key group in the economy of the built environment: "The entrepreneurs that run property companies are responsible for initiating development projects and managing them. The risk incurred by participants in the development process, such as banks and construction firms, is related not only to the risk of the project being undertaken but also to the financial risk associated with the property company that initiates and manages the project."

Traditional ratio analysis, and therefore the DuPont method, that focus on the ROA and ROE are considered to be the basic route to be taken by non-accountants and non-financial managers and therefore formed the basis of the empirical study and research of this article. The area of discriminant methods is still unclear to the majority of analysts.

6. Methodology

The property development industry in South Africa entails residential, commercial and industrial development. It was decided to limit the scope of this study to residential property developers to prevent the study from becoming too general, too time-consuming and too expensive. The aim of this study is to determine whether residential property developers in Gauteng apply financial ratio analysis in the development of property. This will be determined by using descriptive statistics based on data obtained by means of a questionnaire.

6.1 Development of the questionnaire

The data needed to address the main research question was located with residential property developers and was secured by means of a questionnaire directed at residential property developers. The data was interpreted and correlations (if any) were drawn between the sizes of the selected property developers and the use of financial ratio analysis.

The questionnaire was designed to be as brief as practically possible in view of the amount of information needed for the study. The four questions posed were designed to obtain relevant information in terms of the use of financial ratio analysis. The questions were designed with the traditional approach to financial ratio analysis as basis by focusing on the relevant areas of liquidity, activity, solvency and profitability.

The aim of the questionnaire was to determine whether respondents used the method of financial ratio analysis in analysing and interpreting their financial statements (for the purpose of internal management) by applying the traditional approach.

6.2 Sample size

All the registered residential property developers in Gauteng were initially included in the original sample. Only residential property developers registered with the Gauteng Home Builders Association were used in this study.

In deciding on the size of the sample, practical considerations such as reliability and accuracy, as well as time and cost constraints, had to be considered. A small sample of 20 residential property developers, registered at the Gauteng Home Builders Association was considered. The statistical relevance of the variables was tested by applying Fisher's exact test (See attachment 1).

6.3 Sampling method

At the time of the sampling, a total of 33 residential property developers were registered at the Gauteng Home Builders Association. When an attempt was made to contact all these developers, it was found that a number of them were no longer operating. This limited the sample. In the end, only 20 registered residential property developers were selected from the remaining group. A questionnaire was presented telephonically to each residential property developer selected. A covering letter explained the purpose of the research.

6.4 Representative of the response

All 20 of the telephonic interviews conducted were satisfactorily completed. In addition, there is no reason to believe that the questions contained in the questionnaire would cause bias in the answers received, because every single respondent was asked the same questions in the same manner. The response was therefore considered to be acceptably representative of the sample.

7. Research results

Having explained the research method followed in the study, attention is now paid to the statistical analysis of the data collected, as well as the results obtained from the data. Special attention is paid to ascertaining the extent of the use of financial ratio analysis, as well as any relationship between the size of respondents' businesses and financial ratio analysis as business tool.

7.1 Number of years in the property development business in relation to the use of financial ratio analysis

Table 1: Number of years in the property development business in relation to the use of financial ratio analysis

Number of years	Use of financial ratio analysis		
	Yes (frequency)	No (frequency)	Total %
0-10 years	3	5	40.00
11-20 years	5	2	35.00
21+ years	5	0	25.00
Total	13	7	100

Fisher's exact test: $p = 0.0934$

Table 1 places the number of years that the respondents have been in the residential property development business in relation to their use of financial ratio analysis in their businesses. The following trend is clear: developers who have been in the market for less than ten years tend not to use financial ratio analysis. A small percentage of developers who have been in business between 11 and 20 years still do not use financial ratio analysis but more of these developers do use financial ratio analysis. Developers who have been in the developing business for more than 20 years all use financial ratio analysis in their businesses. Fisher's exact test shows that there is no statistically significant relationship between the variables ($p > 0.05$).

7.2 The use of liquidity ratios by residential property developers in relation to their applicability

Table 2: The use of liquidity ratios in relation to their applicability

Use of liquidity ratios	Applicability of liquidity ratios			
	Low	Medium	High	Total %
Never	3	1	2	31.58
Sometimes	0	1	3	21.05
Always	0	0	9	47.37
Total	3	2	14	100

Fisher's exact test: $p = 0.0101$

Table 2 indicates that there is a relationship between how often residential property developers in Gauteng use the liquidity ratio and how applicable this ratio is to them. A total of nine of the 20 respondents (47.37%) always use liquidity ratios in their businesses. These respondents also have a high regard for the applicability of the liquidity ratio. In terms of Fisher's exact test of 0.0101, there is a statistically significant relationship between the two variables ($p < 0.05$).

7.3 The use of solvency ratios by residential property developers in relation to their applicability

Table 3: The use of solvency ratios by residential property developers in relation to their applicability

Use of solvency ratios	Applicability of solvency ratios			
	Low	Medium	High	Total %
Never	3	3	0	31.58
Sometimes	0	3	4	36.84
Always	1	0	5	31.58
Total	4	6	9	100

Fisher's exact test: $p = 0.0079$

Table 3 examines whether there is a relation between how often residential property developers in Gauteng use solvency ratios and how applicable this ratio is to them. Only four respondents said that they only sometimes use solvency ratios, but they regard these as highly applicable indicators of business performance. A total of five respondents always use solvency ratios and regard these as highly applicable. Fisher's exact test indicates that there is a definite statistically significant relationship between the two variables ($p < 0.05$).

7.4 The use of profitability ratios by residential property developers in relation to the applicability of the return on assets (ROA)

Table 4: The use of profitability ratios by residential property developers in relation to the applicability of the ROA

Use of profitability ratios	Applicability of ROA			
	Low	Medium	High	Total %
Never	2	1	1	21.05
Sometimes	1	1	0	10.53
Always	1	3	9	68.42
Total	4	5	10	100

Fisher's exact test: $p = 0.077$

Table 4 shows information on the use of profitability ratios in relation to the applicability of the ROA of residential property developers in Gauteng. It clearly shows that nine respondents (47.37%) always use profitability ratios and have a high regard for the applicability of ROA, and that 68.42% of the respondents always apply profitability ratios as an indicator of business performance. Ten respondents regard the return on assets ratio as highly applicable, but Fisher's exact test shows that there is no statistically significant relationship between the variables, as $p > 0.05$.

7.5 The use of profitability ratios by residential property developers in relation to the applicability of the return on equity (ROE)

Table 5: The use of profitability ratios by residential property developers in relation to the applicability of the ROE

Use of profitability ratios	Applicability of ROE			
	Low	Medium	High	Total %
Never	2	1	1	21.05
Sometimes	0	1	1	10.53
Always	1	2	10	68.42
Total	3	4	12	100

Fisher's exact test: $p = 0.1429$

Table 5 examines whether there is any relationship between profitability ratios, as used by residential property developers, and

the ROE ratio. Ten respondents (52.63%) always use profitability ratios and regard the ROE ratio as highly applicable. Fisher's exact test shows that there is no statistically significant relationship between profitability ratios and the applicability of the ROE ratio as an indicator of business performance, as $p > 0.05$.

8. Challenges to the application of ratios analysis in the built environment

Although there is no generally accepted theoretical framework for the use of financial ratio analysis, there seems to be agreement on the following: basic principles (underlying assumptions), simplicity of calculation and application, limitations to the analysis, and the intricacy (pitfalls) of the interpretations of the results of the analysis.

Non-accountants and non-financial managers who are still deciding whether or not to utilise ratio analysis should understand why they need to make certain choices and decisions regarding ratios. Figure 5 can serve as a start to this process.

8.1 Process of choices in the application of ratios

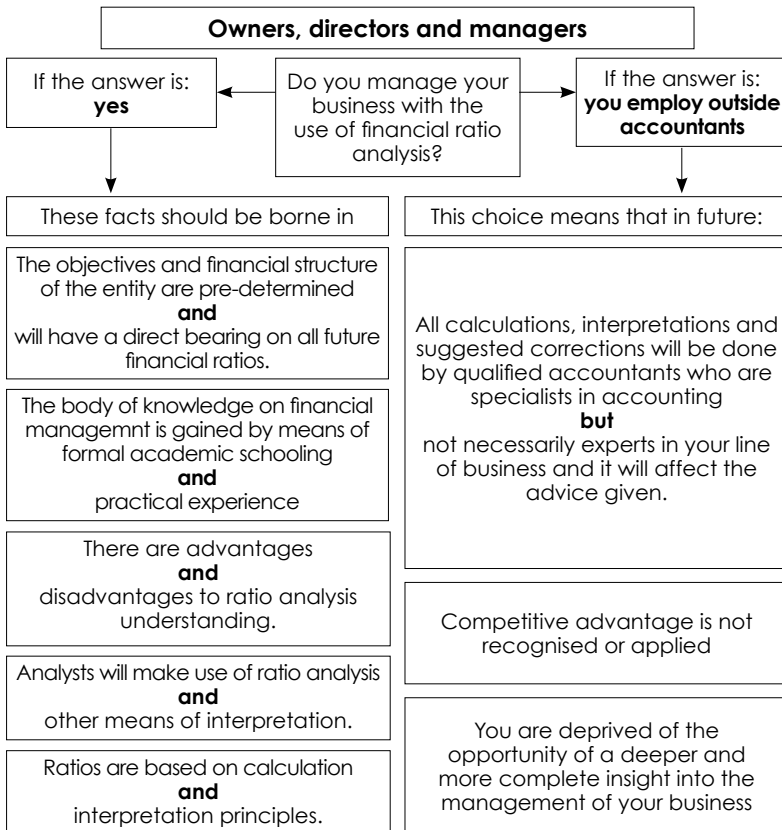


Figure 5: Decision structure to managers who decided to use ratio analysis

8.2 Examples of lesser known pitfalls in ratio analysis

All textbooks that include ratio analysis convey extensive examples of the more obvious pitfalls in ratio application. Lesser known pitfalls should also be borne in mind, such as:

- An isolated ratio could create a wrong impression. The liquidity ratio without the profitability ratio is incomplete information on the sustainability thereof.
- Company goals and objectives could be asset accumulation-based, profit realisation-based, human resource or infrastructure

development-based or social responsibility-directed. The progress towards its success requires different measurements.

- The objectives of the company should be expressed in the form of target ratios over the full spectrum of financial ratios to indicate the effect thereof on all the ratios. It must be expressed what effect one ratio will have on other important ratios. This might also explain why certain ratios can be considered to be positive although they might be lower than industry standards. Budgeted target ratios should equal the period of all other financial budgets.
- External influences on internal ratios are sometimes difficult to measure and can easily be over- or undervalued in explaining substantial ratio changes.
- Absolute amounts versus percentages are sometimes forgotten in the interpretation. The mere size of amounts can lead to decreased percentages.
- Ratio analysis is not merely the calculation of a given ratio. The interpretation of the ratio value is more important. A meaningful basis for comparison is needed, otherwise increases and decreases can be misleading.
- Comparison to industry averages is popular but can easily be misleading. It is important to investigate significant deviations to either side of the industry norm, as it might indicate other problems related to the specific ratio.
- Any year-to-year changes might not seem significant but might point to major problems if the cumulative effects over longer periods are investigated.
- Certain trends or expected occurrences cannot be detected by any single ratio or group of ratios, e.g. balances arising from contractual agreements in the construction industry.

8.3 Knowledge and skills required by any user of ratios

The following is a short list of some of the more important background requirements to financial ratio analysis:

- The aspects of the Theoretical Framework of Accounting (AC000), such as:
 - the principles on which they are based (underlying assumptions);

- the qualitative characteristics of financial reports, and
- interaction between qualitative characteristics and constraints.
- The principles of Presentation of Financial Statements (AC101:IAS1), such as:
 - objective and components;
 - overall considerations, and
 - basic disclosure requirements.

The synergy achieved by the balance sheet, income statement, cash flow statement, the directors' report and the notes to the financial statements. According to Vorster, Koen, Koornhof, Oberholster & Koppeschaar (2003: 17):

A close relationship exists between these statements that together form the annual financial statements, as each reflects different aspects of the same transactions and events... No single statement will, in itself, provide all the necessary information to the users of the statements.

- The fact that financial statements are a report on historic events (it can or cannot assist in predicting future events).
- The traditional approach to financial ratio analysis is a simple but effective way of analysing and interpreting financial statements if correctly applied.

The knowledge and skills needed are summarised in Table 6.

Table 6: Summary of knowledge and skills needed when ratios are applied

No.	Discipline	Owners, directors and managers need to understand
1	Accounting	<ul style="list-style-type: none"> • Director's report (Chairman's review) • Balance sheet • Income statement • Statement of changes in equity • Cash flow statement
2	Information systems	The information system designed implemented and maintained must supply such data that will enable the accountants to prepare the entity's financial statements according to the requirements of AC000 and AC101/IAS101 and enable the users of financial ratios to calculate fundamental ratios with reliable accuracy.
3	Management	<ul style="list-style-type: none"> • Which parties are interested in the financial statements (and why). • How the financial statements will be analysed by both internal and external parties regarding various aspects of performance and how this will affect the value of the firm. • The cautions to be exercised in using financial ratios (and why).

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4	Marketing	<ul style="list-style-type: none"> • The effects their decisions will have on the financial statements particularly the income statement and cash flow statement • How analysis of a ratio such as the Return on Equity (ROE) measures the return on shareholders' investment in the entity and how this may affect the firm's decision on financing policies selling prices or rental levels.
5	Operations	<ul style="list-style-type: none"> • How the cost of operations is reflected in the financial statements. • How the analysis of ratios such as return on total assets (ROA) measures the overall effectiveness of management in generating profits with the available assets. This may affect future decisions regarding assets and facilities.
6	Financial management	<ul style="list-style-type: none"> • How to read financial statements. • The types of financial ratios available. • How and when to use and rely on financial ratios. • Internal and external effects of financial ratios on long-term financing and planning.

Source: Adapted from Gatman 2003: 40

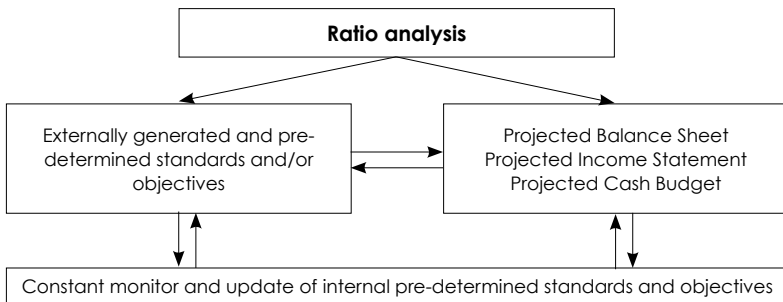


Figure 6: Available ratio analysis model to the property investment industry

8.4 Application – proceed with caution

Melicher (2006: 153) determined that “comparing a firm's ratios to other companies or to the average for the industry requires a degree of caution”. The following cautions are advised:

- **Caution one** - Managers need to learn to ‘read and understand’ financial statements. The moment that the information and message contained in the financial statements are understood no method of analysis can supply more information. Ratios (and the analysis and interpretation thereof) will assist in ‘zooming in’ on the problems and strengths identified.

- **Caution two** - Decide on a method of analysis, namely horizontal analysis (evaluating data on a whole series of statements over a period), vertical analysis (statement data expressed as a percentage of a base amount) or ratio analysis (identification, measurement and evaluation of financial relationships or ratios of the financial position and results). In the case of ratio analysis, a decision must be made whether to use trend or time-series analysis (evaluate a firm's performance over time), cross-sectional analysis (compare different companies at the same point in time), industry-comparative analysis (compare a firm's ratios against average ratios for other companies in the same industry) or any combination of the previous.
- **Caution three** - Obtain a basic textbook on the subject of financial analysis/ratio analysis and work through the calculations. Textbooks focusing on property are not freely available. In the authors' opinion it is advisable to work through a general financial management textbook first and then move on to industry-specific text. Management style is related to personality characteristics. Managers need to incorporate financial and other management principles into their evolving management style. Books available are (listed in order of 'user friendliness'): Faul *et al.* (1997: 806-807), Coetzee *et al.* (2002: 199), Melicher (2006: 154) and Gitman (2003: 53). A certificate course in financial management for non-financial managers is an excellent start.
- **Caution four** - Only proceed to methods such as DuPont style analysis and articles on the topic once a thorough understanding of ratios, their advantages and disadvantages are mastered.
- **Caution five** - Attempt ratios that are not generally accepted by practitioners and academics, such as discriminant or any other more advanced analysis method. Figure 6 illustrates the summarised route available to practitioners seeking benchmarks and comparable standards in the analysis process.

8.5 Available interpretation tools and comparative measures

Coetzee *et al.* (2002: 199) state that the analyser has a variety of tools at his disposal. Table 7 presents an evaluation in terms of availability to the practitioner.

Table 7: Available interpretation tools

	TOOLS	Available	Notes
1	Comparative financial statements	Seldom	A
2	Ratio analysis	Financial statements	B
3	Structural analysis	Financial statements	C
4	Index changes	Financial statements	D
5	Specialised analysis <ul style="list-style-type: none"> • Cash budgets • Analysis and changes in financial position • Changes in gross profit percentage • Break even analysis 	Financial statements or Management statements	E

Coetzee (2002: 199) cautions that the evaluation of the above must always be considered against one or more of the comparative measures contained in Table 8.

Table 8: Comparative measures

	COMPARATIVE MEASURES	Available	Notes
1	Objective, pre-determined standard or objective (budget)	Management statements	F
2	Historical data peculiar to the enterprise Corresponding analyses for previous periods of comparable and related figures	Management statements	G
3	Data from outside the firm Corresponding analyses of the industry or other enterprises in the industry (Similar enterprises or similar industry)	Seldom	H
4	Empirically accepted standards (including the experience and background of the analyst)	Yes but be aware	I

Notes to tables 7 and 8

- Comparative financial statements

Competitors' (private companies' and partnerships') statements are seldom available.

- Ratio analysis

Determined by availability and frequency of compilation of own financial statements.

- Structural analysis

The evaluation of movements in amounts is highlighted by interconnected ratios.

- Index changes

It is extremely difficult to find an adequate base amount to express all other amounts.

- Specialised analysis

This analysis would be crucial to management on a pre-determined period basis.

- Pre-determined standard or objective

When ratio calculations are based on projected statements and budgets it results in maximum management planning and control. Targets and their success are clear.

- Historical data peculiar to the enterprise

Although restricted by historical policies it is very helpful in performance measurements.

- Data from outside the firm

Information would not be specific but will constitute industry averages.

- Empirically accepted standards

Empirical standards are seldom accepted by practice due to specific characterisation qualities attached to every industry type, management team, finance policy, etc.

9. Conclusion

9.1 The sample

Residential property developers in Gauteng apply financial ratio analysis in the management of their property development entities. It is clear that there is a tendency to use components of financial ratio analysis, especially where developers have been in the property development business for more than ten years. Statistically significant relationships were found in terms of liquidity and solvency.

The analysis showed that the majority of the respondents (60%) have been in the residential property development business for more than ten years. Developers who have been in the business for less than ten years tend not to use financial ratio analysis as a financial technique.

There was no clear statistically significant relationship between the number of years spent in the residential property development business and the use of financial ratio analysis, but it was clear that developers who have been in the development business for more than ten years tend to a large extent to use financial ratio analysis in their businesses.

There is a statistically significant relationship between the use of liquidity ratios and their applicability within the residential property development business in Gauteng.. The majority of the respondents use liquidity ratios and regard them as highly applicable. As discussed above, liquidity refers to the company's ability to meet its short-term obligations. The same level of statistical significance was found in terms of the use of solvency ratios and their applicability. The company's solvency status refers to its use of debt financing. It can therefore be deduced that residential property developers regard both their short-term position and their debt position over the long term as important. Both these components of financial ratio analysis relate to the risk position of the business. With regard to the use of profitability ratios and the applicability of the ROA and the ROE, there was no statistically relevant relationship between the variables. Despite this, the majority of those respondents who use profitability ratios regard the ROA and ROE as highly applicable. These ratios refer to the use of own funds and assets to create profits and maximise the wealth of the owners of the company.

In terms of the research conducted it is clear that financial ratio analysis is used by residential property developers but not to the extent that it may be used.

9.2 Ratio analysis

Financial ratio analysis is widely used by managers to monitor their firm's performance and to add substance to decisions. There is always the danger that the sheer volume of data can overwhelm managers. This is sometimes the reason why only a few key ratios are used to summarise the firm's liquidity, activity, solvability and profitability.

The fact that the financial ratio analysis can illustrate, in a way, what management techniques were applied emphasises its importance as a management aid in property development. Financial ratio analysis gives an indication of future financial trouble areas which can lead to corrective action and act as cornerstone for planning and control.

The built-environment professionals should take note that accountants differ on the success and reliability of discriminative ratio analysis. Rather adhere to what you know and make the transition at a time when it can be attempted with more assurance.

10. Recommendations

Although there is no internationally laid down standard for financial ratios, a company's financial position and performance must be assessed against some type of industry benchmark, and financial ratios assist management to ask the right questions (rather than provide the right answers).

Each time ratio analysis is attempted, the following illustration of a general misinterpretation should be borne in mind. According to Dewey (2007: online) "When the perceptual system forms a percept or gestalt, the whole thing has a reality of its own, independent of the parts. The Gestalt psychologist Kurt Koffka made a famous statement about this: 'The whole is other than the sum of its parts.' This statement is often translated into English as: 'The whole is greater than the sum of the parts.' Koffka did not like that translation. He firmly corrected students who substituted 'greater' for 'other' (Heider, 1977). 'This is not a principle of addition', he said."

Financial management skills enable managers to make educated decisions on all other management functions such as marketing, purchasing and human resources. Management need this fundamental skill which cannot be passed on to their accountants and be expected to contribute equally to their understanding of the challenges facing them in management. As all management decisions contain a financial component (which is frequently quite substantial), the concern arises: How is management expected to come to a decision if they only possess part of the skills required to perform the task competently?

Financial management competency assists managers in general to make decisions concerning their entities. Although the exact amount of financial management skill and knowledge required by general managers is unknown, what is known is its importance.

Remember the motto: *Avoid making correct decisions - based on wrong information.*

Attachment 1: Fisher's exact test

It is sometimes only possible to obtain limited amounts of data, especially if the sample tested is very small, as in this case. When the numbers in a table are small, it may be best to compute exact probabilities rather than one-sided alternatives for either probability models or a situation in which all marginal totals are fixed (Steel & Torrie, 1980: 504). The test used in such calculations is called Fisher's exact test. It determines whether the probabilities (p) are statistically significant. In this kind of test we require a comparison or standard against which the answer (p) can be tested.

1. The process of performing Fisher's exact test

1.1 Notation

For notation in the steps outlined below, let a , b , c , and d be cell entries; let r and c be row and column totals; and let n be sample size, as in the table below:

Table A: Notation

a	b	r_1
c	d	r_2
c_1	c_2	N

1.2 Computation of Fisher's exact test

Fisher's exact test directly computes p , the probability of getting a table as strong as the observed table or stronger. This requires computing Fisher's formula below for the given table, as well as for all stronger tables, then summing the separate p 's to get the total probability of a table that is strong or stronger, as explained below.

1.3 Specify the observed table and all stronger tables

Reduce the cell with the lowest count by one in steps to create the tables stronger than the observed table.

Table B: Computation

Observed Table			Next Stronger			Strongest Table		
7	2	9	8	1	9	9	0	9
5	6	11	4	7	11	3	8	11
12	8	20	12	8	20	12	8	20

1.4 Computing the probability by means of Fisher's exact test:

$$p = (r_1!r_2!c_1!c_2!)/n!a!b!c!d!$$
$$p_{\text{observed}} = 9!1!1!12!8!/20!7!2!5!6! = .132$$
$$p_{\text{stronger}} = 9!1!1!12!8!/20!8!1!4!7! = .024$$
$$p_{\text{strongest}} = 9!1!1!12!8!/20!9!0!3!8! = .001$$
$$p_{\text{total}} = .157$$

Note that factoring is denoted by ! The arithmetic operation of multiplying 1 times 2 times 3, etc., up to n, is for the case of n!

1.5 Interpreting Fisher's p

Interpreting Fisher's p is straightforward. In the example above, p is .157, meaning that there is a 15.7% chance that, given the sample size and distribution of the observed table, we would get a table as strong or stronger by chance sampling alone. Since scientists ordinarily consider .05 to be the cut-off point for the acceptability of significance levels, we would conclude that the distribution in the observed table cannot be said to be significantly different from chance.

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