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Financial management techniques used by residential property developers

Peer reviewed

Abstract

Real estate development can be one of the largest contributors of wealth in society; and it plays a key role in determining the level of economic prosperity of individuals, business firms and the country. For residential property developers to be successful wealth creators, they have to do sound financial planning, make the right decisions and use prudent financial management techniques. These decisions involve numerous alternatives, of which only one may yield the ultimate benefits and create the most wealth.

The objective of this article is to investigate which financial techniques and methods residential property developers apply in practice when they undertake capital structure decisions or determine their cost of capital, as well as the methods that they use when they make capital budgeting decisions. Through statistical testing, important relationships such as the sources of finance used by residential property developers and the capital structure they tend to choose were identified. The results showed relatively low costs for obtaining both debt and own funds. Developers tend to disregard techniques such as the net present value (NPV) and internal rate of return (IRR), because these techniques are unfamiliar to them. The relevance and importance of promoting the study of finance amongst real estate practitioners and familiarising them with its decision-making techniques and methods was one of the main recommendations of this article.

Keywords: Capital asset pricing model, Capital structure, Cost of debt, Cost of equity, Dividend discount model, Internal rate of return, Net present value, Residential property development, Weighted average cost of capital

Abstrak

Eiendomsontwikkeling kan een van die grootste bydraes tot welvaart in ‘n gemeenskap maak; en dit speel ‘n sleutelrol in die bepaling van die ekonomiese vooruitgang van individue, besighede en ‘n land. Residensiële eiendomsontwikkelaars kan suksesvolle welvaartskeppers wees indien hulle goeie finansiële beplanning onderneem, die regte besluite neem en optimale finansiële bestuurstegnieke toepas. Hierdie besluite behels verskeie alternatiewe, waarvan slegs een die hoogste opbrengs mag lewer en die meeste welvaart kan skep.

Die doelwit van hierdie artikel is om ondersoek in te stel na watter finansiële tegnieke residensiële eiendomsontwikkelaars in die praktyk aanwend wanneer hulle kapitaalstruktuurbesluite maak of hul koste van kapitaal bepaal, asook die metodes wat hulle toepas wanneer hulle kapitaalinvesteringsbesluite maak. Deur middel van statistiese toetsing is belangrike verwantskappe afgelei, soos die bronne van

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finansiering wat residensiële eiendomsontwikkelaars gebruik en die kapitaalstrukture wat hulle geneig is om te kies. Die resultate toon lae kostes in die verkryging van beide skuld en eie kapitaal. Residensiële eiendomsontwikkelaars is geneig om tegnieke soos die netto huidige waarde (NPV) en die interne opbrengskoers (IRR) te ignoreer omdat hulle nie daarmee vertroud is nie. Een van die hoofaanbevelings van hierdie artikel is dan ook die toepaslikheid en belangrikheid daarvan om die studie van finansies onder eiendomspraktisyns te bevorder, en om hulle meer vertroud met finansiële besluitnemingstegnieke en metodes te maak.

Sleutelwoorde: Markprys waarderingsmodel; Kapitaalstruktuur; Koste van skuld; Koste van ekwiteit; Dividend verdiskonteringsmodel; Interne opbrengskoers; Netto teenswoordige waarde; Residensiële eiendomsontwikkeling; Geweegde gemiddelde koste van kapitaal

1. Introduction

The goal of any business is to maximise the wealth of its owners. Real estate development can be one of the largest contributors to wealth in society. It plays a key role in determining the level of economic prosperity of individuals, business firms and the country. Property developers can have a positive impact on a community, especially when they develop residential property. However, for residential property developers to be successful wealth creators, they have to do sound financial planning, make the right decisions and use prudent financial management techniques.

When developers need to make financial decisions, they are faced with numerous alternatives, some of which are more beneficial to them than others. By applying sound financial principles and techniques, they can choose the best alternative – the alternative that will ultimately be the most financially rewarding and that will create the most value. One can therefore safely assume that there is a need amongst practitioners in the property development sector not only to understand the basics of financial management, but also to be informed of the application of optimal financial management techniques.

The goal of this article is to determine which financial management principles and techniques property developers were already applying. More specifically, this article investigate the use of capital budgeting techniques such as the net present value (NPV), the internal rate of return (IRR) and the use of various financing sources (mainly debt or equity).

The goal is pursued by focusing on three sub-questions:

- What is the capital structure (in other words, the mix between debt and equity finance, if any) that residential property developers use?

- What is the cost of capital that residential property developers use?

- Do residential property developers use capital budgeting techniques such as the NPV and the IRR as decision-making criteria to evaluate development projects?

The following hypotheses were tested by means of descriptive statistics:

Hypothesis 1:
Residential property developers use a mix of debt and equity finance to fund development projects.

Hypothesis 2:
The cost of the various capital sources varies amongst residential property developers.

Hypothesis 3:
Discounted cash flow techniques (such as the NPV and the IRR) are decision-making criteria that residential property developers apply.

2. Literature review

The goal of any firm is to maximise the value thereof for its owners. This value is a function of a firm's investment opportunities measured through its share price. The share price is based on the risk, return and magnitude of cash flows generated (Gitman, 2009: 15). The investment decision itself relates to the capital structure of a company and, according to Du Toit, Neuland & Oost (1997: 183), it is also related to the long-term financing forms of capital. These forms of capital are the following:

- shareholders' capital, consisting of owner's equity in the form of ordinary and preference share capital, retained earnings and reserves; and

- long-term liabilities in the form of long-term loans and bonds.

A company's optimal mix of these forms of finance is known as its optimal capital structure (Brealy & Myers, 2000: 473). A company gears itself by introducing debt into the capital structure of the company. Head & Watson (1998: 209) refer to the term 'gearing' as the amount of debt a company uses relative to its equity finance. Capital structures are influenced by country-specific factors. In a European study conducted by Bancel & Mittoo (2004: 130), it was found that there are differences across countries with regard to several capital structure dimensions. The quality of a country's legal system also plays an important role in cross-country variances and so does the interpretation of the cost of capital.

According to Robinson (1989: 49), the capital needed for property development takes two forms. The first is debt (normally, short-term bridging finance). The second form of capital needed by a developer is equity capital. Normally, equity capital is used before debt capital is advanced. One of the functions of management is to consider whether the use of debt will contribute positively or negatively to the company's operations and profitability. The use of debt differs according to industry – in the property industry, using debt is standard practice for both developers and service companies.

Firer, Jordan, Ross & Westerfield (2008: 449) argues that "a firm's overall cost of capital will reflect the required return on the firm's assets as a whole." Gitman (2009: 504) describes the cost of capital as the rate of return that a company must earn on its project investments to maintain the project's market value and to attract funds. Brigham & Gapenski (1996: 334) stress that the overall cost of capital of a company is critically important for the following reasons:

- maximising the value of a company requires that the costs of all inputs, including capital, be minimised; and to minimise the cost of capital, one must be able to estimate it;

- capital budgeting decisions require an estimate of the cost of capital for discounting purposes; and

- many other types of decision, including those related to the leasing of property, bond refunding and short-term asset management, require estimates of the cost of capital.

A fundamental question in the study of finance is whether financial executives can increase the value of a business firm. Gitman (2009: 13) explains that the key activities of a financial manager include performing financial analysis and planning, and making investment and financing decisions. The object of an investment or capital budgeting decision is to find real assets that are worth more than they cost, thus contributing to the maximisation of the value of the business firm and creating value for shareholders in the process.

In the property development sector, the main focus is the development and management of construction projects in such a way that it satisfies the customer's needs. Gray & Larson (2000: 4) define a project as "a complex, non-routine, one-time effort limited by time, budget, resources, and performance specifications designed to meet customer needs." The question arises whether or not such a project will contribute effectively to the value of a business firm and, for the purposes of this study, to the value of a residential property development. Ling & Archer (2005: 421) claim that a discounted cash flow analysis (such as the NPV and the IRR) has become the main financial analysis tool used to evaluate the investment potential of real estate.

Gray & Larson (2000: 37) explain the importance of using financial models such as the NPV criterion in development projects, but they also stress that other factors, such as technology, public constraints and strategic fit cannot be disregarded, and are also important criteria for selecting and prioritising residential property development projects.

This topic has been researched extensively by a large number of authors. The arguments for and against using either the NPV or the IRR as decision-making criteria are well documented; and they are discussed in almost all the corporate finance textbooks. Brealy & Meyers (2000: 101-108) argue that it is a pity that many companies prefer to use the IRR rather than the NPV as an investment criterion. These authors explain the many pitfalls and difficulties related to the IRR as a criterion. Gitman (2009: 438-439) argues that, on a theoretical basis, the NPV method is a better approach to capital budgeting, because the use of the NPV assumes that the future cash flows generated by an investment are reinvested at the company's cost of capital. In practice, however, many investors tend to use the IRR criterion, because businesspeople are more concerned with rates of return than the actual rand value earned. Brigham & Gapenski (1996: 410) rightly point out that different evaluation methods provide different information, and for an investor to make the correct decision, it would be unwise to disregard the information inherent in any of the above methods.

Ryan, A.R. & Ryan, G.P. (2002: 355) assert that financial managers and academics do not always agree on the choice of the best capital budgeting method to use, and stress that, in the financial literature, the NPV has always been preferred to the IRR in terms of management preferences.

Sangster (1993: 309) argues that much attention has been given to the NPV and the IRR as sophisticated capital budgeting techniques and that the payback criterion is no longer valid, as it is a less sophisticated technique. Pike (1996: 89) presents findings similar to those reported by Sangster (1993); for example, the fact that the use of discounted cash flow techniques has increased and that a combination of techniques such as the NPV and the IRR is often used. Firer & Parry (1990: 58)

conclude that, although frequent use of sophisticated capital budgeting techniques is limited to a small number of companies, a need for greater use of these techniques to assist decision-making is emerging.

A recent study on South African companies by Du Toit & Pienaar (2005) found that companies that undertake relatively large capital expenditure tend to prefer the IRR and the NPV methods. International studies on capital budgeting practices over four decades show that there has been a definite shift in the capital budgeting evaluation techniques employed by companies. A study by Ryan, A.R. & Ryan, G.P. (2002) indicated that financial managers have never been in full agreement on the choice of the best capital budgeting method.

A detailed analysis of a number of past studies on capital budgeting techniques by Cooper, Morgan, Redman, & Smith (2002) has confirmed the shift towards discounted cash flow techniques over time. In their analysis of various research projects, they found that the popularity of the IRR as a primary capital budgeting method had increased from 10% in 1959 to 41% by 1975 and to 57% by 1990. However, the NPV did not enjoy either the same popularity or the same spectacular increase in use over time.

It therefore seems that empirical studies covering a period of decades indicate that the NPV has trailed the IRR as the preferred capital budgeting method for a long time and that the incorporation of risk in the capital budgeting process varies both in the methods applied and in the rate of application of these methods, but that this picture is changing.

Bruner, Eades, Harris & Higgens (1998) report on a number of studies that investigated the use of various cost of capital techniques. Firstly, they cite Gitman & Mercurio, who surveyed 177 Fortune 1000 companies in 1982 and found that the respondents did not appear to apply current financial theory in their cost of capital measurement. Secondly, they cite Bierman, who found in 1993 that 93% of his respondents used a weighted average cost of capital. Next, they cite Trahan and Gitman, who reported in a 1995 study that 30% of their respondents used the capital asset pricing model (CAPM). The study by Bruner *et al*. (1998) found that 85% of their best practice firms used the CAPM.

Graham & Harvey (2001) found that executives use the mainline techniques that business schools have taught for years, the NPV and the CAPM, to evaluate capital budgeting projects and to estimate the cost of equity. However, executives are less likely to follow traditional finance practice when setting their capital structure ratios.

An important conclusion in respect of the use of financial techniques such as capital budgeting methods or cost of capital practices and their application to residential property development projects is that such techniques are a useful tool, but that they must be considered in the wider context of all the other factors related to residential property development projects. Such techniques are decision-making tools and should not be regarded as the alpha and the omega of selecting the best alternative from among a number of projects.

3. Research method

The property development industry in South Africa entails residential, commercial and industrial development. It was decided to limit the focus of this article to residential property developers to prevent the study from becoming too general, too time-consuming and too expensive.

To limit the study to the research questions set out in the introduction of this article and to test the three hypotheses, descriptive statistics were used. The statistics were based on data obtained by means of a telephonic questionnaire.

All the registered residential property developers in the Gauteng province were initially included in the original sample. Only residential property developers registered with the Gauteng Home Builders Association were used in this study. At the time of the sampling, a total of 33 residential property developers were registered with the Gauteng Home Builders Association. When an attempt was made to contact all 33 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 randomly selected from the population of 33.

The residential property developers were selected according to the following criteria:

- all the residential property developers had to be located in Gauteng;
- commercial and industrial property developers in Gauteng were excluded; and
- the sample had to be purely random.

The questionnaire was designed to be as brief as practically possible, taking into account the information needed for the study. The questions were designed to elicit relevant information in respect of the use of the selected financial principles and techniques. The questions were worded in such a way that they would test developers'

- use of a capital structure;
- use of a weighted average cost of capital (WACC); and
- evaluation of development projects by using the NPV and IRR as criteria.

The aim of the questionnaire was to determine whether respondents used these financial principles and techniques in the decision-making process.

All 20 of the telephonic interviews that were conducted were satisfactorily completed. Furthermore, there is no reason to believe that the questions contained in the questionnaire would cause bias in the answers received, because every respondent was asked the same questions in the same manner and the answers were recorded consistently.

Sometimes it is possible to obtain only limited amounts of data, especially if the sample tested is relatively small, as it was in this study. In such cases, it may be best to compute exact probabilities rather than one-sided alternatives for either probability models or a situation in which all the marginal totals are fixed (Steel & Torrie, 1980: 504). The test used in such calculations is Fisher's exact test. It determines whether the probabilities (p) are statistically significant at a certain level, usually 5% (0.05). In this test, a comparison or standard was set against which the answer (p) could be tested.

4. Research results

The empirical research results are discussed below, paying particular attention to ascertaining the extent of the use of these financial techniques (use of capital sources, cost of capital calculations and capital budgeting methods) by property

developers. In addition, any relationship between the use of these principles and techniques by the respondents and their time in the property development industry was investigated. It was assumed that the longer a developer had been in the property development sector, the more experienced the developer would be and the more likely it was that the developer would use these financial techniques.

4.1 The relationship between sources of finance and length of time in property development

Table 1 presents the choice of capital sources by property developers. There were only three alternatives, namely debt, owner's equity and a mix between the two. The use of the sources was also plotted against the number of years that a respondent had been in business.

Table 1: The relationship between sources of finance and length of time in property development

Time in property development	**Sources of finance used**			
	100% Own funds (Equity)	**100% Debt financing**	**Mixture between own funds and debt financing**	**Total %**
0 – 10 years	2	1	5	40
11 – 20 years	0	1	6	35
21 + years	1	0	4	25
Total	3	2	15	100

Fisher's exact test: $p = 0.7847$

A total of 15 respondents (75%) used a mixture of own financing and debt financing to finance development projects, irrespective of the number of years they had been in the residential property development business. Very few residential property developers in Gauteng used either only their own funds or only debt financing to finance development projects. Fisher's exact test indicates that there is no statistically significant relationship between the two variables ($p > 0.05$). The results set out in Table 1 above relate to the first hypothesis, namely that residential property developers in Gauteng used a mix between debt and equity to fund development projects. This hypothesis was proven to be true.

The next set of results indicates the types, models and methods that developers used to determine the WACC.

4.2 The relationship between the cost of equity and length of time in the property development business

Table 2: The relationship between the cost of equity and length of time in the property development business

Time in property development	**Cost of equity as a percentage (%)**				
	< 10%	**11% - 15%**	**16% - 20%**	**> 21%**	**Total %**
0 – 10 years	3	0	2	1	38
11 – 20	4	1	0	1	38

years					
21 + years	1	3	0	0	24
Total	8	4	2	2	100

Fisher's exact test: p = 0.1246

The data in Table 2 shows that eight respondents' cost of obtaining their own funds was below 10% (irrespective of the number of years they had been in the property development business). The prime lending rate from commercial banks at the time of the study was 13.5%. Very few respondents' cost of obtaining own funding for development projects was greater than 16%. Fisher's exact test indicates that there is no statistically significant relationship between the two variables, as p is greater than 0.05.

4.3 Frequency analysis on the cost of equity for residential property developments

Table 3: Frequency analysis on the cost equity for residential property developments

Cost %	**Frequency**	**Percentage**
< 10%	8	52
11% - 15%	4	26
16% - 20%	2	11
> 21%	2	11
Total	16	100

The data in Table 3 confirms the analysis reflected in Table 2 above. Eight respondents' (52%) cost of obtaining own funds was less than 10%, with 78% of the respondents' cost of obtaining own finance below 15%.

4.4 The relationship between the cost of debt financing and length of time in the property development business

Table 4: The relationship between the cost of debt financing and length of time in the property development business

Time in property development	**Cost of debt financing as a percentage (%)**				
	< 10%	**11% - 15%**	**16% - 20%**	**> 21%**	**Total %**
0 – 10 years	6	1	0	0	39
11 – 20 years	5	2	0	0	39
21 + years	3	0	0	1	22
Total	14	3	0	1	100

Fisher's exact test: p = 0.5436

Table 4 indicates that 14 respondents' cost of obtaining debt finance for development projects was below 10%. The prime lending rate at the time of the study was 13.5%. This is the same pattern that was established in Table 2. However, Fisher's exact test shows that there is no statistically significant relationship between respondents' number of years in the property development business and the cost of the debt finance they obtained.

4.5 Frequency analysis on the cost of debt financing for residential property developments

Table 5: Frequency analysis on the cost of debt financing for residential property developments

Cost %	Frequency	Percentage
< 10%	14	78
11% - 15%	3	17
16% - 20%	0	0
> 21%	1	5
Total	18	100

Table 5 indicates that the majority of respondents' cost to obtain debt finance was below 10%. This data confirms the data set out in Table 4. Only four respondents paid more than 11% for debt financing.

4.6 The use of the constant dividend growth model and the CAPM in determining the WACC

Table 6a: Use of the constant dividend growth model

Is this model applied?	Frequency	Percentage
Yes	0	0
No	20	100
Total	20	100

The frequencies set out in Table 6a clearly indicate that none of the respondents used the constant dividend growth model to determine the cost of equity for development projects.

Table 6b: Use of the CAPM

Is this model applied?	Frequency	Percentage
Yes	10	50
No	10	50
Total	20	100

The data in Table 6b shows that capital asset pricing was used in practice by 50% of the residential property developers in Gauteng; however, the remaining 50% of respondents did not use the CAPM to determine their cost of equity and ultimately the WACC.

The results set out in Tables 2 to 6 addresses the second hypothesis, namely that the cost of various capital sources varies amongst residential property developers in Gauteng. No statistically significant relationships were found in the analysis of these topics, showing that property developers were unfamiliar with the financial models in calculating the WACC. Based on the analysis above, the second hypothesis had to be rejected.

The last set of results reports on the use of capital budgeting techniques applied by property developers. Whether the length of time they had been in the business was related to their choice of capital budgeting method was also investigated.

4.7 The relationship between the use of the NPV by residential property developers and length of time in the property development business

Table 7: The relationship between the use of the NPV by residential property developers and length of time in the property development business

Time in	Use of the NPV

property development	Use NPV never	Use NPV sometimes	Use NPV always	Total %
0 – 10 years	2	4	2	40
11 – 20 years	3	3	1	35
21 + years	0	3	2	25
Total	5	10	5	100

Fisher's exact test: p = 0.8813

It is clear from Table 7 that there was no relationship between the number of years for which residential property developers in Gauteng had been in the property development business and their use of the NPV criterion. Only five respondents used the NPV at all times, whilst another ten used it at least sometimes and five did not use it at all. Fisher's exact test confirms this observation statistically, as the p value is much larger than 0.05.

4.8 The relationship between the use of the IRR by residential property developers and length of time in the property development business

Table 8: The relationship between the use of the IRR by residential property developers and length of time in the property development business

Time in property development	Use of the IRR			
	Use IRR never	Use IRR sometimes	Use IRR always	Total %
0 – 10 years	2	5	1	40
11 – 20 years	3	3	1	35
21 + years	1	2	2	25
Total	6	10	4	100

Fisher's exact test: p = 0.7637

Table 8 reveals that, as was the case with the NPV criterion, the use of the IRR showed no relationship to the number of years for which residential property developers in Gauteng had been in the property development business. Only four respondents used the IRR at all times. Another ten used it at least sometimes and six did not use it at all. Fisher's exact test shows that there is no statistically significant relationship between the two variables ($p > 0.05$).

Although there is no statistical significance between the variables in both tables 7 and 8 above it appears that the shorter time the respondents are in property development the more they tend to use NPV and IRR. This is a good sign but needs further investigation.

4.9 Relationship between the NPV and the IRR as applied by residential property developers

Table 9: The relationship between the NPV and the IRR as applied by residential property developers

Use of the NPV	Use of the IRR			
	Use IRR never	Use IRR sometimes	Use IRR always	Total %
Use NPV never	5	0	0	25
Use NPV sometimes	1	9	0	50
Use NPV always	0	1	4	25
Total	6	10	4	100

Fisher's exact test: p = 1.539E – 06

Table 9 reflects the relationship between the NPV criterion and the IRR criterion as applied by residential property developers in Gauteng, expanding on the information contained in Tables 7 and 8. Interestingly, these two tables, by quite a margin, yield the same results in terms of the number of years spent by the respondents in the property development business and the use of the respective decision-making criteria. These results point ahead to the outcomes set out in Table 9. A trend between the NPV and the IRR these two variables was established as follows: a total of five respondents never used the NPV or the IRR as decision-making criteria in development projects, while the same number of respondents used the NPV and the IRR as decision-making criteria between 1% and 50% of the time. Three respondents used the NPV and the IRR as decision-making criteria between 51% and 99% of the time, while four respondents used these techniques as decision-making criteria all the time. Fisher's exact test confirms a statistically significant relationship between the use of these two variables, as $p < 0.05$.

The data set out in Tables 7 to 9 relate to the third hypothesis, namely that the NPV and the IRR are decision-making criteria that residential property developers in Gauteng apply. The analysis showed that there is no statistically significant relationship between these techniques and the number of years that developers spent in the property development business. However, the results did show that there is a relationship between the use of the NPV and the IRR. This hypothesis was rejected, based on the results of this study.

5. Conclusion and recommendations

With regard to the financing of development projects, the majority of respondents chose a mix of own funds and debt financing. No statistically significant relationship could be established between the number of years they had spent in the property development business and the sources of finance they used.

There was no statistically significant relationship between the number of years spent in the residential property development business and the cost of equity or the cost of debt financing. The majority of respondents paid less than 10% for both debt and equity.

Disappointing, but relevant, was the lack of popularity of the constant dividend growth model (it was not used at all) and the CAPM in the determination of the cost of equity. Only half of the respondents used the CAPM. The most common reason given for not using any of these models was being unfamiliar with the models. The low estimates of the cost of equity and the cost of debt may be due to the fact that more than 50% of the respondents do not use CAPM. Another important factor is that the chosen respondents are not listed firms which may make these models less attractive purely because of the dividend issue. Further research may suggest how the 10 respondents that use the CAPM derive their beta.

Even more disappointing was the respondents' use (or rather, non-use) of the NPV and the IRR as decision-making criteria – there was a statistically insignificant relationship between the use of these techniques and the number of years for which developers had been in the residential property development business. Some of the most important reasons given by respondents for not using the above techniques were the following:

- they do not know about the techniques;

- they do not know whether the techniques are applicable, because their business activities are relatively small;

- they prefer to use current market prices and the current business situation rather than complicated techniques; and

- they determined prices according to the competitive nature of their activities.

In spite of the above findings, an important deduction can be made when the use of the NPV and the use of the IRR as applied by residential property developers in Gauteng are related to each other. The trend that could be established between the use of the NPV and the IRR was that the majority of the respondents who used the methods at all used the two methods in conjunction. Fisher's exact test also confirms a statistically significant relationship between these two variables. Although these techniques differ in principle, they are both regarded as sophisticated capital budgeting techniques.

Based on the results of this study, the following recommendations can be made:

- academic institutions should ensure that financial management principles and techniques are combined with practical applications in the property development sector; and

- academic institutions should ensure that students in construction-related fields are taught the relevance of applying financial theory to the practical decisions they make.

It is up to the academics in construction and finance to use the results of this study to improve the education that they provide for their students. Such an improvement can only be achieved by adding practical, real life situations to the financial theory taught to these students. The emphasis should fall on case studies and projects designed to identify the problems that arise in the interface between theory and practice. This in itself requires further extensive research that involves both academics and practitioners.

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