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Measuring Corporate Real Estate Asset Management Performance

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Abstract

It is difficult to measure relative corporate real estate asset management performance, as different organizations require different outputs from their property assets. However, prior research has identified a number of input factors or dimensions relating to corporate real estate that tend to occur together in organizations exhibiting high levels of performance. This paper proposes a methodology to combine these input variables into a single relative measure of corporate real estate asset management performance using factor analysis. The model on which the measure is based is tested by applying it to data collected in a survey of 457 organizations in New Zealand. The results show consistency in response amongst organizations and with prior research in respect of six variables that are important to CREAM performance. This leads to the derivation of a single performance measure that reflects the combined effect of these variables.

Introduction.

The contribution effective corporate real estate asset management can make to an organizations core business activity has come in for increased attention over the last ten years. However, in order to learn from organizations that have made progress it is necessary to identify and characterize those aspects of management that contribute to an enhanced level of performance

Identifying good performance in a corporate real estate situation is much more difficult than for traditional "investment" real estate or for the corporate organization as a whole. In the latter two situations overall quantitative output measures such as the internal rate of return, return on equity, or return on assets, or qualitative assessments, such as comparison to core business objectives or industry benchmarks are relatively easy to apply.

In contrast, corporate real estate outputs are usually the internal inputs to another part of an overall process. For example, the output may be the optimal provision of real estate assets in order to facilitate the achievement of core organizational goals. As such they are likely to be closely tied to the nature of the organization, may have no market in which pricing or performance comparisons can be made and therefore be very difficult to measure across a range of differently structured and focused organizations.

The aim of this paper is to propose a methodology for deriving a single measure of CREAM performance for individual organizations that incorporates most of the factors or dimensions of performance that have been identified as significant by earlier research. The model is then applied to a data set of corporate real estate asset manager's responses to a mail survey to test for both consistency of response amongst the survey respondents and consistency with the results of earlier research overseas.

Literature Review

As differently structured and focussed organizations require different things from their real estate assets, for example: marketing profile, low cost, distribution efficiency, employee retention or proximity to markets or resources, there is no easily identified "output" indicator of "good" performance. As a result previous performance research has focused on inputs to, and the process of, corporate real estate decision-making (Gibson 1995a). The theory is that if there are better inputs, systems and processes to deal with real estate, then better decisions more in line with the organizations overall goals will result.

Using this approach, Veale (1989) put forward and tested for significance seven "dimensions", amongst chief executive officers namely;

- the presence of a formal, organized real estate unit,
- the use of management information systems for real estate operations,
- the use of property by property accounting methods,
- the frequency of reporting real estate information to senior management,

- the exposure of real estate executives to overall corporate strategy and planning,
- availability of information and methods for evaluating real estate performance and use,
- the performance of real estate assets relative to overall corporate assets.

A similar type of approach was also adopted by Pittman and Parker (1989). A “divergence” based model of CREAM performance resulted identifying the following variables as being significant:

- centralized real estate authority,
- a comprehensive computerized corporate real estate inventory,
- senior reporting level,
- having a profit centre structure,
- communication with CRE staff regarding overall corporate goals,
- having a formal real estate plan,
- real estate staff size relative to real estate assets.

The close similarity of these findings is obvious indicating a high degree of consensus on the prerequisites for good CREAM performance. Many of these factors or dimensions have also been individually examined in more detail by other authors.

For example, the existence of and structure of CREAM units has been studied by Zeckhauser and Silverman (1982), Hite, Owers and Rodgers (1987), Sanford, Gadiant and Hook (1987), Rutherford and Nourse (1988), Avis, Gibson and Watts (1989), Rutherford and Stone (1989), Teoh (1992), Kimbler and Rutherford (1993) plus other authors. The existence of a CREAM unit has been found to be significant in terms of a company’s performance thus reinforcing the notion that active management of real estate will contribute to the overall success of an organization.

More controversial is the effect of structuring the real estate unit as a profit or cost centre. Beherens (1982) and Plattner and Ferguson (1991), tend to favour the profit centre alternative as being the most effective, but Rutherford and Stone (1989), Avis, Gibson and Watts (1989) and Veale (1989) reveal no empirical evidence of a significant advantage with either a profit centre or cost centre structure.

The existence and form of real estate inventories has been studied by: Zeckhauser and Silverman (1983), Avis, Gibson and Watts (1989), Veale (1988 1989), Nourse (1989 1990), Gale and Case (1989), Teoh (1992), Apgar (1993) plus others. Zeckhauser and Silverman (1983) stated that prudent decision-making requires monitoring data and it is extremely difficult, if not impossible, to make informed real estate decisions without an independent real property management information system. Other authors generally found many organisations had poor or non-existent property information systems, and those that did were orientated towards accounting rather than decisionmaking data. An improvement in the state of CRE management information systems can therefore be seen as a prerequisite to higher levels of CREAM performance, and as this issue is relatively easy to determine it can be used (in conjunction with other factors) as a primary indicator of CREAM performance.

Veale (1988 1989), Pittman and Parker (1989) Avis, Gibson and Watts (1989) Teoh (1992), Nourse (1994) and other authors have found that communications and working relationships with management, finance and operating divisions are extremely important to CREAM performance. The number of levels away from, and the frequency of contact with, the CEO were used by all the above as measures of the efficiency and effectiveness of communication, and found to be significant. Also important to effective communication was the existence of centralized real estate authority, having an established corporate real estate strategic plan, and regular exposure and input to this plan by corporate real estate staff.

Veale (1988 1989), Hurtt (1988), Gale and Case (1989), and Teoh (1992) also examined the attitude of the chief executive of an organization towards real estate assets. Their results consistently show a positive relationship between chief executive attitude and CREAM performance as measured by other performance variables.

The linkage between overall corporate strategy and real estate strategy has been investigated by many authors including Nourse (1986), Levy and Matz (1987), Avis, Gibson and Watts (1989), Duckworth (1993), Nourse and Roulac (1993), Stephens (1994), Nourse (1994) Gibson (1994 1995), and Apgar (1995).

Avis, Gibson and Watts (1989) found business and political decisions had short lead times often making it difficult to accommodate the longer planning period required for property. This led to little CREAM strategic planning and a reactive approach to property needs. Nourse and Roulac (1993) developed a model of the interdependency of CREAM decisions and conclude that; “Too often, real estate transactions are approached predominantly from a deal-making rather than a strategic posture” (p.493). Duckworth (1993) presents a methodology for reconciling the tradeoffs discussed by Nourse and Roulac using a decision matrix and statistical quality control techniques derived from general management literature.

“Real Estate Strategy – a new management paradigm” is put forward by Apgar (1995 p.23) as involving developing scenarios in three dimensions – Space, Functions and Time - in order to conceptualise different CREAM portfolio alternatives. Apgar then presents case study results from applications of this method that show significant reductions in occupancy costs and/or increase in efficiency of use of real estate assets.

Gibson (1995) asserts trends such as changing organizational structures, work practices, technology, and the increasing number of stakeholders, will all impact on the way real estate assets are managed. In such circumstances involvement of real estate in the strategy of the organization was essential - strategic thinking being rated as the number one priority skill for the future, by a survey of 1246 general managers by the Institute of Management (Gibson 1995b p.110).

As the corporate real estate literature is limited a number of published case studies were also examined. These included: Silverman (1990), Simons (1993), Gibson (1991), Gibson (1994), French (1994), Byrne (1994), RICS (1987), Bourne (1988), Bourne (1989), HCFE (1993)

Literature Review Conclusion

There is general agreement that measuring and comparing CREAM performance across different organizations is difficult and that an inputs and process approach is usually the only practical

option. There is also consensus on a relatively small number of critical input and process factors that are important irrespective of the organisation and the nature of its activities.

There are other performance measurement techniques from outside the corporate real estate field that could also be applied to some of the issues identified in this research. However, in the interests of developing a theoretical thread already proposed in the CREAM literature, as well as drawing comparisons across time and between countries, it was decided to base the research methodology for this study on an approach that had already been applied to corporate real estate.

Research Methodology

The aim of this research was to determine if a number of previously identified important variables could be combined into a single holistic measure representing overall CREAM performance. This required three hypotheses to be tested, each of which builds on the previous hypothesis.

The data used to test the hypotheses was from a mail survey of 457 corporate real estate executives from a wide range of commercial and non-profit organizations in New Zealand. The questionnaire (copy attached as appendix A) was quite comprehensive as the data collected was to be used for a number of purposes in addition to the subject of this paper.

The response rate of 42% was high compared to similar studies and analysis of non-respondents indicated the results should be representative.

Data Analysis and Results

Analysis Step 1 – Specifying the Performance Model

As no single characteristic of an organization defines its CREAM performance, the survey asked a number of questions based on the “dimensions/factors of performance” identified by Veale (1989) and Pittman and Parker (1989). Specifically, respondents self rated their organization via answers to the following questions spread throughout the questionnaire

Question Number	“Dimension of performance” or “Performance factor”
M1	<i>Existence of a separate corporate real estate unit</i>
R5h	<i>Cash flow contribution by the corporate real estate unit</i>
C1, C2	<i>Reporting level/frequency</i>
C3a, M8j	<i>Strategic planning for corporate real estate</i>
M8a, M8b, M8c	<i>Attitudes towards and processes for managing CRE</i>
I1b, I2a to I2k	<i>Management information systems for corporate real estate</i>
M8k, R5l, M6a to M6g	<i>Information and techniques used for CRE decision making</i>

The answers to some of these questions relied on the respondent’s qualitative assessment of their organization’s situation, and were likely to be more variable than those able to be quantitatively determined. As a result the Hypothesis (i) was effectively a cross check of the data, determining whether respondents were consistent in their responses to multiple questions addressing the same performance issue from a different perspective. If consistent this would also facilitate the identification of a smaller number of variables to include in the final CREAM performance model

HYPOTHESIS (i)

Survey respondents are inconsistent in their responses to multiple survey questions addressing the same CREAM performance issue.

The statistical tests used amongst these questions were as follows:

- For combinations of two binary variables – Chi squared
- For combinations of binary with ordinal variables – Mann Whitney U – Wilcoxon Rank Sum W
- For combinations of two ordinal variables – Spearman Correlation Co-efficients

Results for Step 1

Survey questions M1 and R5h reflected variables that were unlikely to be misinterpreted so the results were included directly in the CREAM performance model.

Questions C1 and C2a addressed reporting level and frequency but the results highlighted particular problems in using these questions in a New Zealand setting. The literature has established the importance to CREAM performance of a close relationship between the person responsible for corporate real estate and the CEO, however, New Zealand organizations are relatively small, with few levels of management. This meant there was insufficient differentiation within the sample on the basis of organizational level alone. Therefore a refinement was adopted where reporting level (question C1) was combined with frequency of liaison (question C2a) to arrive at a composite 17 level measure named “report”. In subsequent analysis this new “report” variable was used, but this was not completely satisfactory as will be discussed later.

For the remaining performance related questions there was scope for ambiguous responses as the questions reflected matters of opinion rather than fact. To reduce the impact of such responses multiple survey questions were asked addressing the same issue in differing ways. It was not the objective of these multiple questions to increase the number of variables under consideration. Rather, if consistency of response could be shown amongst similar questions then Hypothesis (i) could be rejected, and a variable representing the response to a single question could be used in the performance model with increased confidence. If responses regarding the same issue were inconsistent the situation could be investigated further.

Respondents were found to be consistent in their responses to almost all questions addressing the same topic. As a result, the response to a single “best” question for each factor or dimension of performance could be used in the CREAM performance model. The correlation results and the rationale for the choice of each “best” question are detailed below.

Questions on Strategic Planning

Question C3a asked directly if the organization had *a written overall strategic plan for real estate*, whereas question M8j addressed the issue less directly by asking if staff *have regular exposure to and a good understanding of overall organizational strategy on which to base real estate decisions*. A high correlation was expected between these questions and this was the case with a 2-tailed p value of .021 using the Mann-Whitney U test.

Therefore the more specific variable derived from C3a – *existence of a written overall strategic plan for real estate* was adopted for the performance model.

Questions on Management Attitude to CREAM

A similar process to that above was applied to questions M8a, M8b, and M8c testing for correlation using the Spearman Correlation Coefficient. Again the results were as expected with highly significant correlations in the appropriate directions between M8a and M8b ($r= 0.34$, $p=<0.000$), M8a and M8c ($r= -0.45$, $p=<0.000$) and M8b and M8c ($r= -0.42$ $p=<0.000$).

As a result the response to question M8a -*CRE considered not important to organization* was adopted for the CREAM performance model.

Questions on the Use of Management Information Systems for CREAM

Question I1b asked respondents to self-rate the overall performance of their current MIS system (if applicable), whereas Questions I2a to I2k examined the performance of the respondents MIS system on individual attributes. Spearman Correlation Coefficients were applied and the results showed significant correlations (r value range of 0.19 to 0.51, p value range of 0.038 to <0.000) between answers on each of the individual attributes and Question I1b. In addition, the scores for individual attribute questions were summed to obtain a composite measure for the performance of MIS systems for CREAM – named *I2 Total*. The result of this process was again highly correlated with I1b ($r=0.37$, $p=<0.000$).

The result of the above analysis was very high confidence that the response to the more holistic Question I1b (a rating for the overall performance of the organizations property database) was fully representative of the sample and therefore this variable was adopted for the model of CREAM performance.

Questions on Availability of Information and Processes for CREAM

Decision-Making

Using Spearman Correlation Coefficients to compare individual answers to questions M6a through M6g, and R5l with the results for the more holistic question M8k identified no

significant correlations (r values range -0.13 to 0.14, p values range 0.946 to 0.084). However, a number of highly significant correlations were measured amongst M6a to M6g questions and between these questions and the answers to question R51.

To investigate further, the responses for questions M6a to M6f were summed to create a new variable *M6 total*. The rationale was that not all the decision making techniques identified in the individual sub questions are appropriate for all organizations, but in general those using more of the techniques, more frequently are likely to make better CREAM decisions. This combination of factors would be reflected in a totalled score.

M6g was omitted from the total, as the use of independent consultants is likely to be influenced by a variety of factors, which could be both positively and negatively correlated with decision-making processes. For example, consultants may be used as a result of lack of expertise in one or more of the identified techniques and therefore negatively correlated with those factors, (negative correlations were in fact observed but only at the 10% significance level).

The result of the analysis was that the new *M6 total* variable again did not show a significant relationship with the M8k response, but was highly correlated with R51.

It was apparent that question M8k was significantly out of step with other questions on decision making processes, which were displaying the expected consistency of response. An examination of the distribution of responses to question M8k shows little variation between options 3, 4 and 5. This may indicate a problem with the wording of the question. This proposition is also supported by the lack of expected correlation between question M8k and other performance variables, as reported later in this paper.

Use of R51 as the performance variable was theoretically more defensible than use of the “calculated” *M6 total* variable, as the use of property-by-property accounting methods was specifically identified as a “dimension of performance” by Veale (1989). Further weight was lent to this decision by significant correlations between R51 and four of the seven M6 sub-questions, as well as the highly significant correlation with the new *M6 total* combined variable.

As a result of the above analysis the response to question R5l – *Accounting information being available on individual properties* was chosen as the best variable to holistically represent corporate real estate information and decision making processes.

Analysis Step 2 – Checking for Previously Observed Correlations

The next step was to determine if individual respondents exhibited strong correlations across questions dealing with different aspects of CREAM performance as found by previous research (Veale 1988 1989, Pittman and Parker 1989).

HYPOTHESIS (ii)

No statistically significant correlation exists between any of the variables reflecting different CREAM performance factors or dimensions of performance established by earlier research.

The tests used were as follows:

- For combinations of binary with ordinal variables – Mann Whitney U – Wilcoxon Rank Sum W
- For combinations of two ordinal variables – Spearman Correlation Co-efficients.

Table 1 below shows the results for associations between each of the seven performance variables identified as a result of stage 1. Statistically significant results are highlighted.

Table 1 Associations Between CREAM Performance Variables

p values	M1 CRE unit	R5h Cashflow	C1&C2a Report	C3a Strat Plan	M8a Attitude	I1b MIS
M1 CRE unit ¹	#					
R5h Cashflow ²	0.002 #					
C1&C2a Report ³	0.000	0.706 #				
C3a Strat Plan ⁴	0.000	0.000	0.003 #			
M8a Attitude ⁵	0.000	0.049	0.563	0.000 #		
I1b MIS ⁶	0.000	0.004	0.039	0.000	0.000 #	
M8k Decisions ⁷	0.631	0.953	0.317	0.389	0.005	0.128

Cells highlighted show relationships significant at the 5% level

¹ M1 CRE unit = Existence of a separate corporate real estate unit
² R5k Cashflow = Cash flow contribution by the corporate real estate unit
³ C1&C2a Report = Combined reporting level and frequency of liaison
⁴ C3aStrat Plan = Existence of written CRE strategic plan
⁵ M8a Attitude = CRE considered not important to organization
⁶ I1b MIS = the overall performance of current MIS system
⁷ M8k Decisions = Availability of information and methods for evaluating CRE

Significant associations exist for most combinations of variables in Table 1, supporting earlier research findings and giving confidence to the theory that the identified variables may be able to be condensed into a single measure of CREAM performance. As a result Hypothesis (ii) can be rejected with confidence. However, the correlations for variables reflecting *reporting level/frequency (Report)* and *information availability/decision-making methods (M8k)* were not so strong, and so investigation into these variables was carried further.

It was considered that the 17 level categorization of the *report* variable relative to the five or six categories used for many of the other variables might be responsible for the lack of correlation. It was also noted that using 17 levels the distribution was very heavily skewed towards the lower end of the scale – again the result of small organizational size in New Zealand and thus close relationships existing with the CEO.

To address these problems a new variable was created by combining categories to reduce 17 levels to 6. The same analysis was then carried out using the new *Combined Report* variable instead of the original *Report* variable. A comparison of the results (p-values) is shown below.

Table 2 Report and Combined Report Results Comparison

P values	M1 CRE unit	R5h Cashflow	C3a Strat Plan	M8a Attitude	T1b MIS	M8k Decisions	M6 Total	R5l Accounting
C1&C2a Report	0.000	0.706	0.003	0.563	0.039	0.317	0.299	0.006
Combined Report	0.000	0.592	0.001	0.512	0.023	0.574	0.148	0.001

Cells highlighted show relationships significant at the 5% level

Although many of the results improved slightly, the differences were not large and half the performance variables still showed no significant relationship with *Combined Report* - the same result as for the *Report* variable.

It was concluded that due to organizations having few levels in New Zealand, and corporate real estate people reporting at higher levels as a result, the reporting level factor in CREAM performance may be relatively insignificant here compared to overseas research. Therefore, in the interests of simplicity, reporting level/frequency could potentially be excluded from the model of CREAM performance in New Zealand. This aspect will be considered further in the factor analysis stage of this research.

A preliminary assessment was made earlier that R51 - *Accounting information available on individual properties* may be a better information/decision making process variable to include in the performance model than either M8k -*Availability of info/ methods for evaluating CRE* or the combined variable M6 *total*. In order to further test this choice correlations were calculated between all the other components of the performance model and these three decision-making variables.

The results are shown below and indicate that R51 -*Accounting information available on individual properties* is highly correlated with the other six performance variables. M6 *Total* is slightly worse, but both are significantly better than M8k -*Insufficient info/methods for CREAM*, again supporting the rejection of this variable as a significant performance factor.

Table 3 Associations Between Decision Making Variables and Other Performance Variables

p value	M1 CRE unit	R5h Cashflow	C1&C2a Report	C3a Strat Plan	M8a Attitude	I1b MIS	M8k Decisions
R51 Accounting	0.000	0.000	0.006	0.020	0.003	0.020	0.170
M6 Total	0.003	0.000	0.299	0.076	0.037	0.003	0.175
M8k Decisions	0.631	0.953	0.317	0.389	0.005	0.128	#

Cells highlighted show relationships significant at the 5% level

As R51 had the stronger associations and it was theoretically more justifiable to use this result than the calculated variable M6 total, a final decision was arrived at to use the R51 *Accounting information available on individual properties* results for evaluating CREAM in the final model of CREAM performance.

Analysis Step 3 – Applying Factor Analysis to the Data

The last stage was to apply principal components analysis in an attempt to distil the previously identified variables representing “factors” and “dimensions of performance” down to a single composite relative performance measure for CREAM. The null hypothesis reflecting this process is stated below.

HYPOTHESIS (iii)

No single factor measure can be derived that adequately represents the combination of multiple CREAM performance factors or dimensions of performance established by earlier research.

The seven variables listed below were first ranked and then subject to principal components analysis.

C3ASPLA	= Existence of written CRE strategic plan
COMBREP	= Combined reporting level and frequency of liaison
I1BMIS	= The overall performance of current MIS system
M1UNIT	= Existence of a separate corporate real estate unit
M8ATTUD	= CRE considered not important to organization
R5HCFLO	= Cash flow contribution by the corporate real estate unit
R5LACIN	= Accounting information available on individual properties

The results are shown below

Factor Analysis 1

Pairwise deletion of cases with missing values

Extraction 1 for analysis 1, Principal Components Analysis (PC)

Initial Statistics:

Variable	Communality	Factor	Eigenvalue	%of Variation	Cumulative %
C3ASPLA	1.00000	1	2.45772	35.1	35.1
COMBREP	1.00000	2	1.00637	14.4	49.5
I1BMIS	1.00000	3	.95982	13.7	63.2
M1UNIT	1.00000	4	.79381	11.3	74.5
M8ATTUD	1.00000	5	.67507	9.6	84.2
R5HCFLO	1.00000	6	.57700	8.2	92.4
R5LACIN	1.00000	7	.53021	7.6	100.0

PC extracted 2 factors.

Factor Matrix:

	Factor 1	Factor 2
M1UNIT	.70512	.21076
C3ASPLA	.69044	.03601
I1BMIS	.61572	-.09977
R5LACIN	.56312	-.07656
R5HCFLO	.54176	-.40191
M8ATTUD	.53642	-.39380
COMBREP	.45426	.79261

Final Statistics:

Variable	Communality	Factor	Eigenvalue	%of Variation	Cumulative %
C3ASPLA	.47800	1	2.45772	35.1	35.1
COMBREP	.83458	2	1.00637	14.4	49.5
I1BMIS	.38906				
M1UNIT	.54161				
M8ATTUD	.44283				
R5HCFLO	.45503				
R5LACIN	.32297				

Skipping rotation 1 for extraction 1 in analysis 1

It can be seen that two factors were extracted but the relative contribution of each of the seven variables to the two factors was very different. For Factor 1 the contribution of all variables is relatively even, but for Factor 2 the contribution is primarily from COMBREP (*Combined Report*).

Factor 1 explained 35.1% of variation and Factor 2 14.4% of variation.

Note that the *Combined Report* (COMBREP) variable was also associated with inconsistent results in the correlation analysis section of this study, possibly due to the highly skewed distribution of the data. This skewness reflects the small number of levels typical in New Zealand organizations and it was proposed that in a New Zealand context, reporting level might be a relatively insignificant factor in CREAM performance.

The results of the initial factor analysis seem to confirm the above proposition, with the *Combined Report* variable again significantly out of step. As a further check the analysis was re-run with the *Combined Report* variable deleted. The results are shown below.

Factor Analysis 2

Pairwise deletion of cases with missing values

Extraction 1 for analysis 2, Principal Components Analysis (PC)

Initial Statistics:

Variable	Communality	Factor	Eigenvalue	%of Variation	Cumulative %
C3ASPLA	1.00000	1	2.32635	38.8	38.8
I1BMIS	1.00000	2	.96008	16.0	54.8
M1UNIT	1.00000	3	.79976	13.3	68.1
M8ATTUD	1.00000	4	.70263	11.7	79.8
R5HCFLO	1.00000	5	.65312	10.9	90.7
R5LACIN	1.00000	6	.55805	9.3	100.0

PC extracted 1 factors.

Factor Matrix:

	Factor 1
C3ASPLA	.68965
M1UNIT	.68571
I1BMIS	.62768
R5HCFLO	.58286
M8ATTUD	.57547
R5LACIN	.56183

Final Statistics:

Variable	Communality	Factor	Eigenvalue	%of Variation	Cumulative %
C3ASPLA	.47561 *	1	2.32635	38.8	38.8
I1BMIS	.39398 *				
M1UNIT	.47020 *				
M8ATTUD	.33117 *				
R5HCFLO	.33972 *				
R5LACIN	.31565 *				

Skipping rotation 1 for extraction 1 in analysis 1

This analysis with six variables shows a much-improved result, with only one factor extracted and the contribution from all variables quite even. The one factor accounted for 39% of the variation.

In light of the above result, the earlier lack of expected correlation with other variables, and the characteristics of the response distribution as shown in the descriptive statistics, it was decided

that in a New Zealand context, reporting level was a factor or dimension of performance of relatively minor significance in the assessment of the performance level of CREAM.

As a result Hypothesis (iii) was rejected and a model of CREAM performance including the following six variables adopted.

- | | |
|-------|--|
| 1 C3A | <i>Existence of a strategic plan for corporate real estate</i> |
| 2 M1 | <i>Existence of a separate corporate real estate unit</i> |
| 3 I1B | <i>High performing corporate real estate management information system</i> |
| 4 R5H | <i>Contribution of cash flow from corporate real estate assets</i> |
| 5 M8A | <i>Corporate real estate considered important to the organization</i> |
| 6 R5L | <i>Accounting information available on individual properties</i> |

Inputting these variables into factor analysis applied to the 193 survey responses resulted in a single factor score representing overall CREAM performance being associated with each of the respondent organizations. This will facilitate the future investigation of a number of issues related to CREAM performance.

Conclusion

There was generally a high degree of consistency of response amongst organizations to the multiple questions addressing individual CREAM performance issues. This meant that responses from a single “best” question could be relied upon for inclusion in the CREAM performance model greatly simplifying its derivation and application. Also, the model arrived at neatly encapsulated most of the factors/dimensions of performance identified by earlier researchers. Any inconsistencies in response were investigated further, and feasible explanations for such results arrived at. As a result Hypothesis (i) was rejected.

As found in earlier studies, statistically significant correlations were observed amongst almost all of the individual performance variables. As a result Hypothesis (ii) was rejected.

This means that while no single variable can be said to definitively indicate an organizations CREAM performance, a small group of variables tend to occur together and provide a strong indication of performance. This lent further support to the concept of deriving from survey data a single composite performance factor reflective of the overall CREAM performance of each surveyed organization.

As a final step, factor analysis was applied and was successful in extracting a single factor representing the combined impact of six of the seven factors or dimensions of CREAM performance established by earlier research. The single factor that presented analysis problems in this process was also found to generate problems in other forms of analysis, and an adequate explanation for this situation was arrived at.

As a result Hypothesis (iii) was rejected - a simple model of Corporate Real Estate Asset Management Performance had been developed.

Such a singular measure of CREAM performance has not previously been identified and is a significant contribution, primarily in that it facilitates the investigation of a wide range of other CREAM issues. Some of these issues are the subject of forthcoming papers.

Limitations and Further Research

A limitation of this research was that it was based on findings and techniques derived from the limited range of previous studies carried out in the corporate real estate field. If a broader range of literature from the general management area was reviewed, in particular in respect of strategic planning, decision-making and performance measurement, it is likely that other performance models that could equally be applied would be identified.

CREAM is a relatively new area of study and, combined with the lack of professional qualifications of survey respondents, a wide range in the level of understanding of concepts and terminology was likely. This may have impacted on the responses.

As with all surveys of this kind, the results depend on the respondent accurately and honestly reporting and interpreting the situation under study. In this case a large number of the questions required statements of opinion rather than fact and, although important questions were cross checked for consistency of response, it is still likely that some respondents misrepresented the situation applying in their organization for a variety of reasons. In addition, as only a single individual within each organization was surveyed, their opinion of corporate issues may differ from that of others, and a distorted picture result.

The survey was carried out only in New Zealand at a particular point in time and the findings may not reflect the situation in a different place and/or at a different time. The sample size was relatively large and the response rate high compared to some similar studies, so the results should be reasonably representative of the New Zealand situation. However, central government and territorial local authorities represented large sub groups with a high response rate, so an enhancement of the research would be to compensate for this effect and see if the results were affected. There is also potential for non-response bias, and although the types of organizations not responding were similar to those that did, they may have held a significantly different set of opinions.

The development of the above model of CREAM performance has opened up a wealth of future research opportunities. For example, the relationship between CREAM performance and organisational characteristics such as: ownership structure, core business, size of the organisation, degree of organisational restructuring, qualifications and responsibilities of management, extent of outsourcing and CREAM stage of development. A number of these are already underway and will be the subject of forthcoming papers.

Other potential research questions include the following. Do people holding different positions within organizations have the same perception of the factors influencing CREAM performance? Are respondent ratings of situations in their own organizations accurate or is bias evident? Is there a correlation between an individual's subjective assessment of the level of CREAM performance in their organization and the CREAM performance measure arrived at for that organization using the process developed in this study?

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