

## **CHAPTER 5 EMPIRICAL RESULTS AND ANALYSIS**

### **5.1 Introduction**

In this chapter, the results of the statistical tests on the hypotheses are presented and analyzed. The assumption of normal distribution is checked and the results of the tests of normality are discussed. Following this, the results of the statistical tests for each hypothesis are analyzed and discussed.

### **5.2 Normality Assumption**

Since parametric tests are used, any violation of the assumption of normality needs to be tested. There are four variables in this study which require tests of normality before any statistical tests can be conducted. These are SCORE, TLTR, TETR and TOTREV (see Tables 4.2 and 4.4 earlier). The descriptive statistics of these four variables are presented in Table 5.1. The normality of the variables can be tested by examining the skewness of the variables to see whether the distribution deviates from symmetry. It will further be tested by using the normal probability plot and Kolmogorov-Smirnov goodness of fit test.

When a distribution approaches symmetry, the skewness coefficient is approximately zero (Emory and Cooper, 1991, p.475; Norusis, 1990, p.100). From Table 5.1, it can

be seen that the dependent variable, SCORE, has a skewness coefficient close to zero, indicating that there is no significant deviation from normal distribution.

**Table 5.1**  
**Descriptive Statistics of Variables**

<b>Variable</b>	<b>Mean</b>	<b>Std Dev</b>	<b>Skewness</b>	<b>Minimum</b>	<b>Maximum</b>
SCORE	12.19	6.45	0.61	1	30
TLTR	1.28	1.93	4.06	0.0090	11.2105
TETR	1.15	1.88	6.00	0.4408	12.2105
TOTREV	540001903	960577546	2.10	19000	3.847E+09

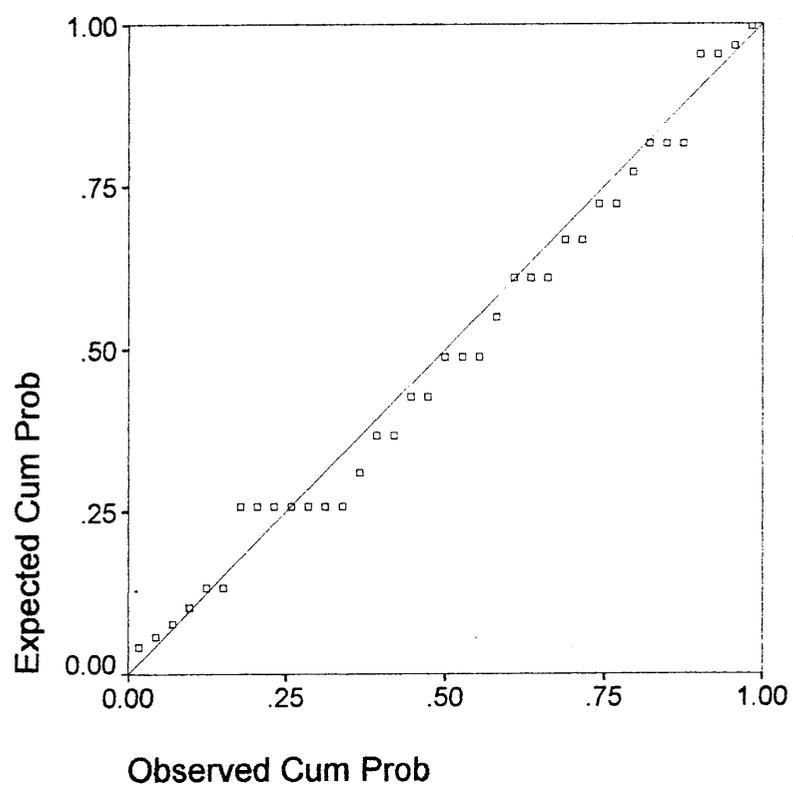
In order to further prove the normality of distribution of SCORE, normal probability plot is used to compare the observed values with the expected values from a normal distribution. Figure 5.1 shows the distribution of the dependent variable, SCORE. As the points fall along a straight line, it indicates that the variable is close to normal distribution.

In addition, Kolmogorov-Smirnov one-sample test is carried out to test for normal distribution. This test compares an observed sample distribution with a theoretical distribution. The K-S test results are shown in Table 5.2. For the dependent variable, SCORE, the test result is not significant. In other words, the hypothesis that the data come from normal distribution cannot be rejected at a significant level of 0.05. This

indicates that the dependent variable, SCORE, does not significantly depart from a normal distribution.

**Figure 5.1**

**Normal Probability Plot - SCORE**



**Table 5.2**  
**Kolmogorov-Smirnov Test for Normal Distribution**

<b>Variable</b>	<b>K-S Z Statistic</b>	<b>2-Tail Probability</b>
SCORE	0.5839	0.8849
TLTR	1.5299	0.0185
TETR	2.9010	0.0000
TOTREV	2.0979	0.0003

For the three independent variables, TLTR, TETR and TOTREV, Table 5.1 indicates that they are not normally distributed. The skewness coefficients of all three variables are greater than 1 and they are all positively skewed. Figure 5.2, 5.3 and 5.4 show the normal probability plots for these three variables. All the three plots show that the observed distribution deviates from the expected distribution, indicating that the three independent variables are not normally distributed.

The K-S one sample tests also support that the variables are not normally distributed. The test results for these three variables are presented in Table 5.2. The results for TLTR is significant at 0.05 level, while TETR and TOTREV are significant at 0.01 level. This indicates that the normal distribution hypotheses are rejected and thus the three independent variables significantly depart from normal distribution.

Figure 5.2

## Normal Probability Plot - TLTR

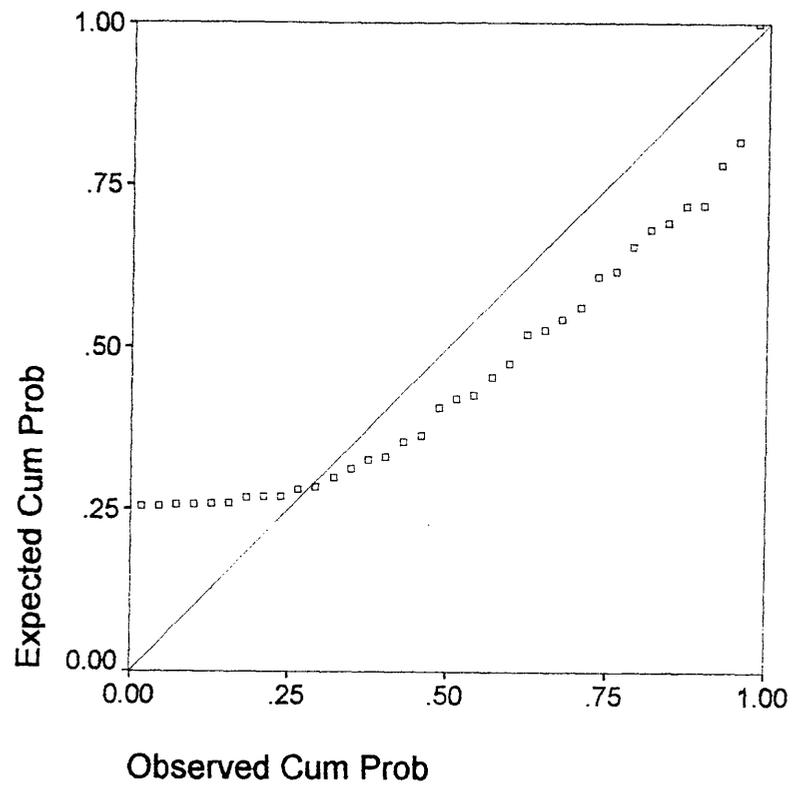


Figure 5.3

## Normal Probability Plot - TETR

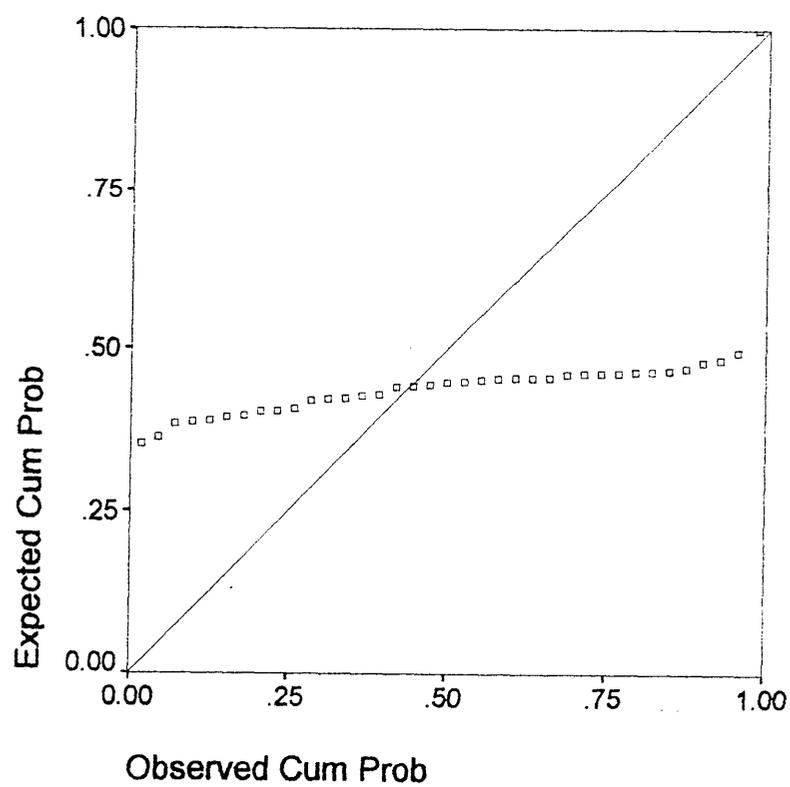
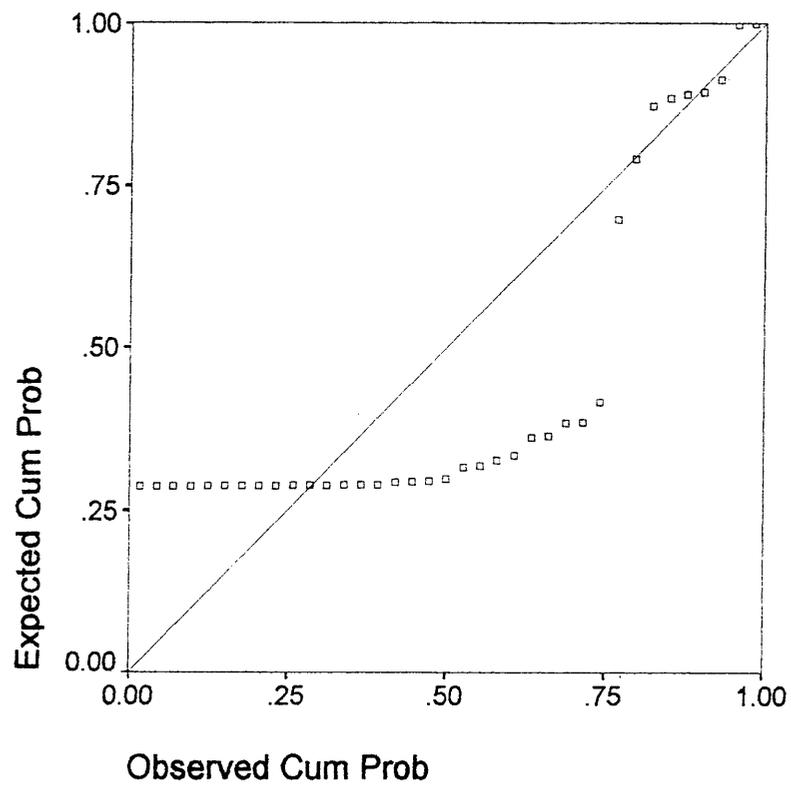


Figure 5.4

## Normal Probability Plot - TOTREV



The results that all the three independent variable are not normally distributed are important for multiple regression analysis since any violation of normality assumption may significantly invalidate the regression result.

The extent of the violation of normality can be reduced by data transformation. That is, “by applying a single mathematical function to all raw data values” (Emerson and Stoto, 1983, p.97). The advantage of transformation is that it helps to promote symmetry of data and facilitate interpretation. Emory and Cooper (1991, p.490) stated that:

We transform data for several reasons: (1) to improve interpretation and compatibility with other data sets, (2) to enhance symmetry and stabilize spread, and (3) to improve linear relationships between and among variables. We improve interpretation when we find alternative ways to understand the data and discover patterns or relationships which may not have been revealed on the original scales.

This suggests that it is appropriate to transform the values of the three independent variables which are not normally distributed so as to improve interpretation. A review of the literature suggests that logarithm transformation is appropriate for this study. Emerson and Stoto (1983, p.110) stated that:

The choice of transformation is often partly a matter of judgement, especially when symmetry is the objective.....If symmetry of the main body of the data is

desired but skewness in the tails is relatively unimportant, we would probably prefer the log transformation. Economists might well favor it for its ease in interpretation.

Ingram (1984), and Robbins and Austin (1986) also used logarithm transformation to correct the normality of data distribution. In using logarithm transformation, Emerson and Stoto (1983, p.104) suggested that “in practice, we almost always use logs to the base 10 for re-expression”. Emory and Cooper (1991, p.491) also suggested that usually base 10 is used for logarithm transformation. Thus, this study uses logarithm to the base 10 for transforming the values of the three independent variables.

Table 5.3 shows the descriptive statistics for the transformed data. The variables are labelled as TLTRLG, TETRLG and TOTREVLG. The letters “LG” are added to the variable names, indicating that they are transformed variables. The results show that the skewness of the variables improves as compared to the raw data. Except TETRLG, the variables are “near-normal”. Norusis (1990, p.115) commented that:

It is almost impossible to find data that are exactly normally distributed. For most statistical tests, it is sufficient that the data are approximately normally distributed.

Thus, this transformed scale is considered satisfactory for TLTRLG and TOTREVLG and is used in the calculation of correlation coefficients and the multiple regression

analysis, the results of which will be discussed later in this chapter. While TETRLG is also used in the calculation, results of any testing must be used with caution.

**Table 5.3**  
**Descriptive Statistics For Transformed Variables**

<b>Variable</b>	<b>Mean</b>	<b>Std Dev</b>	<b>Skewness</b>	<b>Minimum</b>	<b>Maximum</b>
TLTRLG	-0.34	0.79	-0.73	-2.0458	1.0496
TETRLG	-0.05	0.21	4.16	-0.3558	1.0867
TOTREVLG	7.59	1.32	-0.28	4.2788	9.5851

### **5.3 Disclosure and Users Needs Hypotheses**

This section shows the results of hypotheses testing which help to analyze whether public sector entities disclose information on infrastructure which is considered useful to meet users' information needs. The results of hypothesis 1, 2 and 3 will be discussed in the following sections.

#### ***5.3.1 Useful Information Disclosure Hypothesis***

This hypothesis tests whether public sector entities disclose infrastructure information at full disclosure level. Table 5.4 shows the results of the two-sample t test. The result is significant at 0.01 level. This indicates the null hypothesis that the mean scores of all entities equal to the full disclosure score is rejected. The difference between the

mean score of the entities and the full disclosure score is statistically significant. It can be concluded that public sector entities do not disclose infrastructure information at full disclosure level.

**Table 5.4**

**Two Sample t test - Entities' Scores Compared To Full Disclosure Score**

<b>Variable</b>	<b>Mean</b>	<b>Standard Deviation</b>
Full Disclosure Score	52.0000	0.000
Entity Score	12.1892	1.061
Levene's Test for Equality of Variances: F= 59.522 P= 0.000		
t-test for Equality of Means: t-value = 37.52 2-Tail Sig. = 0.000		

In other words, the public sector entities do not disclose infrastructure information at a level that meets users' information needs. This is consistent with the criticism discussed in Chapter 1 that insufficient infrastructure information is reported by the public sector entities.

Referring to the conceptual framework project, the objective of the general purpose financial reporting is to provide useful information to users for decision making. However, the test result suggests that the public sector entities' annual reports do not meet this objective in relation to the disclosure of information on infrastructure.

Following the test result that public sector entities do not provide sufficient infrastructure information to meet users' needs, the next question might be what types of infrastructure information are lacking. While this study does not discuss the types of information in detail, the descriptive statistics of the 13 items of infrastructure information may reveal some interesting results. Appendix 3 and 4 show the descriptive statistics and the frequencies of scores respectively for each item.

The descriptive statistics show that overall, all the 13 items of information have very low level of disclosure. Among the items of financial information, capitalization of infrastructure in the balance sheet, valuation of infrastructure and cost of consumption have a higher level of disclosure, but deferred maintenance has a very low level of disclosure. Some of the interesting notes on the types of infrastructure assets disclosed in the annual reports examined and the valuation policies employed are listed in Appendix 5 and 6. For non-financial type of information, the more frequently disclosed items are the standard of services, capital project plan and infrastructure assets management plan, while replacement cycle and aging schedule, and capacity level required and achieved have a low level of disclosure.

It is interesting to note that the most frequently reported items are capitalization of infrastructure, valuation of infrastructure and cost of consumption. The result is not surprising since the disclosure of these items are required by the accounting standards and financial reporting guidelines for public sector entities. It seems that entities are reluctant to disclose information beyond those required by accounting standards and statutory regulations. Thus, the results have some implications for standard setting

bodies to explore those areas not sufficiently reported by public sector entities to meet users' information needs.

### ***5.3.2 Disclosure and Types of Entities Hypothesis***

This hypothesis tests whether there is a difference in the level of disclosure between general government entities and government business enterprises. Table 5.5 shows the results of the two-sample t test on the difference between the mean scores of the two types of entities. The result shows that the null hypothesis that the mean scores between the two types of entities are equal cannot be rejected at the significant level of 0.05. This means that there is no significant difference between the mean scores of the two types of entities. From the descriptive statistics in Table 5.5, government business enterprises have a higher mean score than general government entities. However, the test result suggests that such difference is not significant statistically.

**Table 5.5**

**Two Sample t test - Type of Entity**

<b>Variable</b>	<b>Mean</b>	<b>Standard Deviation</b>
General government Entities	10.7143	6.341
Government Business Enterprises	14.1250	6.270
Levene's Test for Equality of Variances: F= 0.011 P= 0.918		
t-test for Equality of Means: t-value = -1.63 2-Tail Significance = 0.112		

Thus, it can be concluded that government business enterprises do not disclose more information on infrastructure than general government entities. It can also be inferred from the results that government business enterprises do not meet users' information needs on infrastructure better than general government entities. It can further be inferred that the level of disclosure, and hence users' information needs on infrastructure are not associated with these two types of entities.

### ***5.3.3 Disclosure and Types of Infrastructure Hypothesis***

This hypothesis tests whether there is a difference in the level of disclosure on infrastructure among entities providing different types of infrastructure facilities, that is transport, water, electricity and other public infrastructure facilities. Table 5.6 presents the results of the one-way analysis of variance. The result shows that the null hypothesis that the mean scores of the four groups of entities are equal is rejected at the significant level of 0.05. This means that the difference in the mean scores of the four groups of entities is statistically significant. Thus, it can be concluded that the level of disclosure on infrastructure information by entities providing different types of infrastructure facilities is significantly different.

As mention in Chapter 4, in order to use ANOVA, two assumptions must be met, that is normal distribution and equality of variances. Normality has been tested in section 5.2 and this assumption is met. Equality of variances is tested by the Levene test. Norusis (1990, p.112) suggested that this test is less dependent on the assumption of normality and is particularly useful with analysis of variance. Thus, the Levene test is

used. Table 5.7 shows the results of the test. The null hypothesis that all group variances are equal is rejected at the significant level of 0.05. Thus, the assumption of equality of variance is significantly violated. Under this condition, Norusis (1990, p.199) suggested that if the sample sizes are quite dissimilar and the variances are unequal, it would be better to consider using a statistical procedure that requires a less stringent assumption.

**Table 5.6**

**One-way Analysis of Variance - Transport, Water, Electricity and Others**

<b>Group</b>	<b>Mean</b>	<b>Standard Deviation</b>
Transport	15.2000	11.3004
Water	13.9000	6.0268
Electricity	19.0000	3.6056
Others	9.4211	3.9203

F Ratio = 3.4663  
Significance level of F = 0.0271

**Table 5.7**

**Levene Test for Homogeneity of Variances**

Statistic = 4.7474
2-Tail Sig. = 0.007

In this case, another test seems to be necessary in order to obtain a more reliable result. Kruskal-Wallis One-way Anova is used. Since it is a nonparametric test, it does not specify normal distribution or homogeneity of variances. The result of the test is presented in Table 5.8. It shows that the difference among the four groups of entities is significant at 0.05 level. The result is consistent with the parametric test of one-way ANOVA. Thus, the result that there is a significant difference among the level of disclosure on infrastructure information by entities providing different types of infrastructure is reliable.

**Table 5.8**

**Kruskal-Wallis One-way Anova - Transport, Water, Electricity and Others**

<b>Chi-Square</b>	<b>Significance</b>	<b>Corrected for ties</b>	
		<b>Chi-Square</b>	<b>Significance</b>
9.1801	0.027	9.2614	0.026

However, the above tests only indicate that there is a significant difference among the mean score of the four groups. It does not indicate which groups differ significantly. In other words, it is not able to tell which group has a higher level of disclosure than the other groups, and thus meet users' information needs better.

On examining the descriptive statistics of the four groups of entities, the means of the first three groups, that is, entities providing transport, water and electricity facilities, are quite close to one another, while the fourth group, that is, entities providing other public infrastructure facilities, has a mean value which is much lower than the first

three groups. The result is not surprising. As discussed in Chapter 2, the Public Accounts Committee (1993) definition of infrastructure of transport, water and electricity facilities can be classified as “economic infrastructure”, while other public infrastructure facilities are belonged to “social infrastructure”. Thus, the descriptive statistics show that the level of infrastructure disclosure by entities providing economic infrastructure is different from the level of infrastructure disclosure by entities providing social infrastructure. Further statistical testing is necessary in order to verify this interpretation. This is discussed in the following paragraphs.

Since a comparison between the level of disclosure by entities providing economic infrastructure and social infrastructure is desired, Emory and Cooper (1991, p.552) suggested that a priori contrasts can be used. By a priori contrasts, the means of the first three groups are compared to the mean of the fourth group by the t statistic (Norusis, 1990, p.203). The result is presented in Table 5.9, which is significant at 0.01 level. This shows that the difference between the first three groups and the fourth group is significant. Thus, it appears that entities providing economic infrastructure, that is transport, water and electricity, have a higher level of disclosure than entities providing social infrastructure.

It would be useful to further analyze the level of disclosure among entities providing economic infrastructure so as to determine whether there is any significant difference among these entities. If there is a difference, then which group has a higher level of disclosure. Both one-way analysis of variance and Kruskal-Wallis one-way anova are used. The results are presented in Table 5.10. Both tests indicate that there is no

significant difference among entities providing transport, water and electricity facilities. The Levene test indicates that the assumption of homogeneity of variance is not a problem. Thus, the test result can be considered as reliable.

**Table 5.9**

**A Priori Contrasts Test**

Contrast between group 1, 2, 3 and group 4			
Pooled Variance Estimate		Separate Variance Estimate	
T Value	T Probability	T Value	T Probability
-3.207	0.003	-3.106	0.012

**Table 5.10**

**Difference in Disclosure Level among Entities Providing  
Transport, Water and Electricity Facilities**

<b>One-way Analysis of Variance:</b> F ratio = 0.5217 Significance level of F = 0.6039
<b>Levene Test for Homogeneity of Variances:</b> Statistic = 3.0525 2-Tail Significance = 0.077
<b>Kruskal-Wallis One-way Anova:</b> Chi-Square = 1.5613 Significance level = 0.4581

Thus, it can be concluded that entities providing economic infrastructure disclose information on infrastructure at a higher level than the disclosure by entities providing social infrastructure, thus better meeting users' information needs. However, there is no significant difference in the level of disclosure among the economic infrastructure

group, that is, entities providing transport, water and electricity facilities. While it is not the purpose of this study to explore the reasons in detail, reasons might be due to the fact that the provision of economic infrastructure involves larger amount of financial resources than the provision of social infrastructure<sup>9</sup> as discussed in Chapter 1, and have greater impact on the economy. Thus such entities are under more pressure to disclose more information. The validity of this argument will require further research.

#### ***5.3.4 Summary***

The results of the above hypotheses testing indicate that public sector entities do not disclose infrastructure information at a level which meet users' information needs. Further analysis is conducted on whether particular types of public sector entities disclose more information and thus meet users' need better. The results show that there is no significant difference in the level of disclosure between general government entities and government business enterprises. However, there is a significance difference in the level of disclosure among entities providing transport, water, electricity and other public infrastructure facilities. Entities providing transport, water and electricity facilities as a group, which is being classified as economic infrastructure, has a higher level of disclosure than entities providing other

---

<sup>9</sup>According to the Australian Bureau of Statistics (1993, p.51), for all the state and territory governments in Australia for the year 1992-93, the gross fixed capital expenditure on transport and communication, and water supply together amounts to 4,202 million dollars, constituting about 38 percent of the total gross fixed capital expenditure. Housing and community amenities, excluding water supply, amounts to 2,023 million dollars, that is about 18 percent of the total gross fixed capital expenditure. This illustrates the point that economic infrastructure involves greater financial resources than social infrastructure.

public infrastructure facilities, which is classified as social infrastructure. Thus, entities providing economic infrastructure can be said to meet users' information needs better.

From the above results it can be inferred that users' information needs are not related to the type of public sector entities, but to a certain extent relate to the type of infrastructure provided by public sector entities. On the whole, the results are consistent with the criticism that public sector entities do not provide adequate information on infrastructure.

In addition, the conceptual framework project states that the objective of general purpose financial reporting is to provide useful information to users for decision making. From the above results, it can be inferred that the disclosure of infrastructure information by public sector entities is inconsistent with the expectation of the conceptual framework in this respect.

The results of the above three hypotheses are significant in assessing whether objective (1) of this study is achieved or not. As stated in chapter 1, objective (1) is to determine whether the public sector entities disclose information on infrastructure which is considered useful to meet users' information needs. The study results show that public sector entities do not disclose infrastructure information at a level which meet users' information needs. Comparatively, entities providing economic infrastructure meet users' needs better. Thus, objective (1) is achieved through testing and analyzing hypotheses 1, 2 and 3.

## **5.4 Disclosure and Interests of User Groups Hypotheses**

This seeks to discover whether there is any relationship between the level of disclosure on infrastructure information and the interests of user groups. In other words, do public sector entities have an incentive to serve the interests of different user groups? The results of the testing of hypotheses 4, 5 and 6 by correlation analysis and multiple regression analysis are discussed in the following sections.

### ***5.4.1 Correlation Analysis***

The association between the level of disclosure and the interests of user group is initially tested by the calculation of correlation coefficients, with dependent variable SCORE and independent variables TLTR, TELR and TOTREV. Since the three independent variables do not satisfy the normality assumption, transformed data of these three variables, as discussed in section 5.2, are used. They are labelled as TLTRLG, TETRLG and TOTREVLG. Both Spearman rank correlation coefficients and Pearson product moment correlation coefficients are calculated.

Table 5.11 shows the Spearman rank correlation coefficients of the variables. The results support hypothesis 4 and 6, but do not support hypothesis 5. Thus, the results indicate that the public sector entities have an incentive to serve the interests of resource providers and parties performing an oversight function, but do not have an incentive to serve the interests of recipients of goods and services.

**Table 5.11**  
**Spearman Rank Correlation Coefficients**

	SCORE	TLTRLG	TETRLG
TLTRLG	0.4114*		
TETRLG	-0.1970	-0.0811	
TOTREVLG	0.5245**	0.0551	0.0733
* Significant at the 0.05 level			
** Significant at the 0.01 level			

The variable TLTRLG has the correct sign as expected which is positive, and it is significant. This shows that there is a positive relationship between the level of disclosure on infrastructure information and the debt level, and thus the interests of resource providers. The result is consistent with expectations and also consistent with the results of the previous research on the relationship between the disclosure level and the debt level. This will be further discussed with the results of multiple regression in later section of this chapter.

TETRLG has a negative sign which is not consistent with the expected sign, and the regression coefficient is insignificant. There is no significant relationship between the level of disclosure and the operating results. Thus, it shows that there is no relationship between the level of disclosure on infrastructure information and the interests of recipients of goods and services.

TOTREVLG has a positive sign as expected, and the regression coefficient is also significant. There is a positive relationship between the level of disclosure and the size of entities. Thus, it shows that there is a relationship between the level of disclosure on infrastructure information and the interests of the parties performing an oversight function.

The Pearson product moment correlation coefficients shows similar results. The correlation coefficients of the variables are presented in Table 5.12. TETRLG is negatively correlated with SCORE and it is insignificant. Both TLTRLG and TOTREVLG are positively correlated with SCORE and their regression coefficients are significant.

**Table 5.12**  
**Pearson Product Moment Correlation Coefficients**

	SCORE	TLTRLG	TETRLG	TOTREVLG
SCORE	1.0000			
TLTRLG	0.3366*	1.0000		
TETRLG	-0.2955	0.1869	1.0000	
TOTREVLG	0.5659**	-0.0045	-0.4115*	1.0000

\* Significant at the 0.05 level  
\*\* Significant at the 0.01 level

Thus, conclusion can be drawn from the results of correlation analysis that public sector entities have an incentive to serve the interests of resource providers and parties performing an oversight function, and thus disclose more information on infrastructure in their interests. However, public sector entities do not have an incentive to disclose information on infrastructure in the interests of recipients of goods and services.

#### ***5.4.2 Multiple Regression Analysis***

Multiple regression takes into account the dependency of variables which is not indicated by correlation analysis. Thus, multiple regression is a more powerful tool than correlation when the effect of several variables is considered. The regression is run on the untransformed dependent variable SCORE and the three transformed independent variables, TLTRLG, TETRLG and TOTREVLG.

Table 5.13 shows the results of the multiple regression on these variables. The results are consistent with the correlation analysis discussed in the previous section. TETRLG has a negative sign which is not consistent with the expected sign, and the regression coefficient is insignificant. Both TLTRLG and TOTREVLG have positive signs which are consistent with the expected signs. The regression coefficients of both of these two variables are significant.

**Table 5.13**  
**Multiple Regression Analysis**

Dependent Variable SCORE			
<b>Independent Variable</b>	<b>Coefficient</b>	<b>T Statistics</b>	<b>Significance of T</b>
TLTRLG	3.073237	2.950	0.0059
TETRLG	-6.795944	-1.598	0.1199
TOTREVLG	2.272256	3.421	0.0017
(Constant)	-4.048469	-0.799	0.4303
R Square= 0.48767			
F= 10.15321			
Significant level of F = 0.0001			

The R square of the regression result, as presented in Table 5.13, indicates that the model has only a moderate explanatory power. About 48 percent of the variation in the dependent variable is explained by the independent variables. However, the value of the F statistic indicates that the whole regression equation is statistically significant.

In order to ensure the validity of the results of the regression analysis, it is necessary to ensure that there is no serious violation of the assumptions of the regression analysis. The regression model in this study is based on the assumptions that the model is linear, the error term has constant variance (homoscedasticity) and is normally distributed, and there is absence of collinearity problem. The tests of the assumptions are run on the untransformed dependent variable SCORE and the

transformed independent variables TLTRLG, TETRLG and TOTREVLG as used in the regression model.

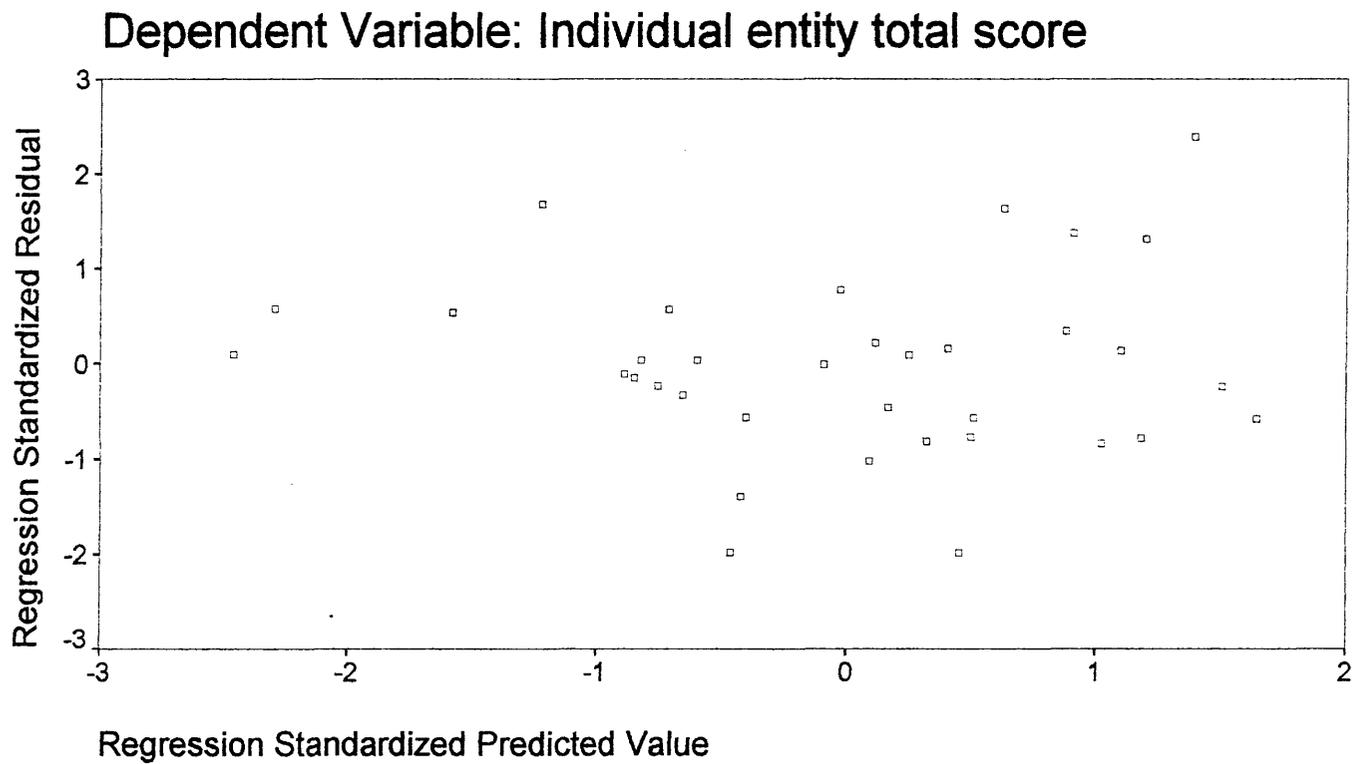
The assumption of linearity, constant variance and normality of error term can be verified by residual analysis (Byrkit, 1987, pp.733-734; Cohen and Cohen, 1983, p.126). This is done by a scatterplot of the residual terms against the predicted values of SCORE. The result of the scatterplot is presented in Figure 5.5. If the assumptions of linearity and constant variance are satisfied, there will be no relationship between the predicted values and the residual values (Norusis, 1990, p.257). The plot shows that there is no systematic pattern, the points are scattered at random. Thus, the association between the variables is likely to be linear and heteroscedasticity is not a problem. In addition, no outliers beyond 3 standard error of estimation is found. This indicates that there is no serious violation of normality assumption.

Collinearity problem is a major difficulty in regression analysis. The problem is analyzed by bivariate correlation coefficients. Both the Spearman rank correlation coefficients presented in Table 5.11 and the Pearson product moment correlation coefficients presented in Table 5.12 are used for analysis. Correlation between independent variables which is greater than 0.8 is considered to be high (Gujarati, 1988, p.299). In this study, none of the correlations is high enough to produce the collinearity problem. The absence of collinearity is also confirmed by the variance inflation factor. This is presented in Table 5.14. A variance inflation factor which is greater than 10 indicates that collinearity problem is significant (Marquardt, 1970,

p.610). In this study, all the variance inflation factor of the variables are below 1.3, indicating that there is no obvious problem of collinearity.

**Figure 5.5**

**Scatterplot of Residual Terms against Predicted Values**



**Table 5.14**  
**Variance Inflation Factor**

	<b>Variance Inflation Factor</b>
TLTRLG	1.044
TETRLG	1.276
TOTREVLG	1.231

From the above analysis, there is no serious violation of the assumptions of the regression model. Thus, the result obtained from the regression analysis in this study is valid and reliable.

#### ***5.4.3 Summary***

The test results on the relationship between the level of disclosure on infrastructure information and the interests of the three groups of users indicate that there is a positive and significant relationship between the level of infrastructure disclosure and two of the surrogates, that is, the debt level and size of entities. However, the relationship between the level of infrastructure disclosure and operating results is negative and insignificant. Thus, conclusion can be drawn from the test results that public sector entities have an incentive to serve the interests of resource providers and parties performing oversight function, and hence disclose more infrastructure information in their interests. However, public sector entities do not have an incentive

to serve the interests of recipients of goods and services and hence are not likely to disclose infrastructure information in their interests.

The results of this study are consistent with the results of previous research. As discussed in Chapter 3, Ingram and Copeland (1982), Evans and Patton (1983, 1987), Cheng (1992) and Giroux and Deis (1993) found that there is a positive and significant relationship between the level of government reporting disclosure and the debt level. The result of this study is consistent with their findings. But from this study, it can be further inferred from the results that such disclosure incentive relates to the interests of the user group of resource providers. That is, a relationship between the level of infrastructure disclosure and the interests of resource providers exists.

The results of this study also indicate that there is a positive and significant relationship between the level of infrastructure disclosure and the size of entity. In Chapter 3, it was discussed that previous research by Buzby (1975), Firth (1979), and Evan and Patton (1983, 1987) indicated that there was a positive relationship between the level of reporting disclosure and size. Thus, the result of this study is consistent with their findings. This signifies that a relationship between the level of infrastructure disclosure and the interests of parties performing an oversight function exists.

The reason for the incentive of the public sector entities to disclose infrastructure information in the interests of resource providers and parties performing oversight function rather than recipients of goods and services may be due to the entities'

perception on the relative importance of different groups of users. The recipients of goods and services are considered as infrequent users of government reports. They make little use of government financial statements (Gaffney, 1986; Daniels and Daniels, 1991).

However, in Chapter 2, it was discussed that the conceptual framework project suggests that all the three groups of users are potential users of public sector financial reports. Given that the objective of general purpose financial reporting is to provide useful information to users for decision making, the interests of all the three groups of users should be observed. But the results show that the disclosure level only relates to the interests of resource providers and parties performing oversight function, but not relates to the interests of recipients of goods and services. Thus, the reporting behaviour of the public sector entities is inconsistent with the expectation of the conceptual framework project. It is beyond the scope of this study to explore the reasons of the results. Further research is required to provide empirical evidence on whether all the three groups of users are important users of public sector financial reports and other reasons for the relationship between the level of infrastructure information and the interests of user groups.

The results of the tests in this section are significant in assessing whether objective (2) of this study as stated in Chapter 1 is achieved. Objective (2) is to determine whether the level of disclosure of infrastructure relates to the interests of particular group of users. In Chapter 3, it was hypothesized that entities' level of disclosure on infrastructure information is positively related to debt level, operating results and size

of entities. That is, public sector entities have an incentive to disclose in the interests of all the three groups of users. The results support hypothesis 4 and 6 but do not support hypothesis 5. It shows that the level of disclosure on infrastructure relates only to the interests of resource providers and parties performing an oversight function. Thus, objective (2) is achieved by testing and analyzing hypotheses 4, 5 and 6.

## **5.5 Conclusion**

In this chapter, the results of the statistical tests are presented and analyzed. In the first part, the level of infrastructure disclosure and users' information needs are evaluated. The results do not support the first three hypotheses, indicating that infrastructure disclosure by public sector entities is not adequate to meet users' information needs. Besides, the results also do not support that there is a difference in the level of disclosure between general government entities and government business enterprises. Comparatively speaking, entities providing economic infrastructure disclose more infrastructure information than entities providing social infrastructure.

In the second part, the relationship between the level of infrastructure and the interests of different user groups is analyzed. The results support hypotheses 4 and 6, but do not support hypothesis 5. Thus, public sector entities have an incentive to disclose more infrastructure information in the interests of resource providers and parties performing an oversight function, but not recipients of goods and services.

The results seem to be inconsistent with the objective of the general purpose financial reporting as stated in the conceptual framework project. It seems that the objective of providing useful information to users for decision making is not met. In addition, the three groups of users as suggested by the conceptual framework are not equally served by the public sector entities.

Overall, the objective of this study is achieved through testing and analyzing the hypotheses. Next chapter will summarize this study.

## **CHAPTER 6 SUMMARY AND CONCLUSION**

### **6.1 Introduction**

This chapter gives a summary and conclusion of the study. The objectives and the hypotheses of the study are restated. The results of the hypotheses testing and the major findings are summarized. Then implications from the results are drawn, followed by the possible limitations related to the study. Finally, recommendations for future research are made.

### **6.2 Restatement of the Objectives and Hypotheses**

This study addresses the issue of insufficient infrastructure information reported by the public sector entities and lack of empirical evidence to support this issue. The problem is addressed by evaluating the existing financial reporting of infrastructure by the public sector entities in relation to the disclosure of infrastructure information considered useful to meet users' information needs. Thus, the objective of this dissertation, as stated in Chapter 1, is:

to evaluate the existing disclosure practices of infrastructure by the public sector entities. Specifically, the study examines the annual reports of the public sector entities in New South Wales so as to determine:

- (1) whether the public sector entities disclose information on infrastructure which is considered useful to meet users' information needs;
- (2) whether the level of disclosure of infrastructure relates to the interests of particular group of users.

The conceptual framework of general purpose financial reporting is used as the framework to evaluate the problem and relevant literature is referred to throughout the study. The above objectives lead to the formulation of the following hypotheses:

(1) Disclosure and Users Needs Hypotheses

- H1: The public sector entities' annual reports disclose information on infrastructure at full disclosure level.
- H2: The annual reports of government business enterprises disclose more information on infrastructure than the annual reports of general government entities.
- H3: There is no difference in the level of disclosure on infrastructure among the public sector entities providing transport facilities, water facilities, electricity facilities and other public infrastructure facilities.

(2) Disclosure and Interests of User Groups Hypotheses

- H4: Entities with higher level of debt disclose more information on infrastructure than entities with lower level of debt.

H5: Entities with higher level of operating deficit disclose more information on infrastructure than entities with lower level of operating deficit.

H6: Larger entities disclose more information on infrastructure than smaller entities.

### **6.3 Summary of Major Findings**

This section summarizes the major findings of the study. These are as follows:

1. Insufficient infrastructure information disclosed by public sector entities is evident in the annual reports of the public sector entities providing infrastructure facilities in New South Wales. Information on infrastructure considered useful to users in various literature is not fully disclosed. Thus, users' information needs on infrastructure are not met.

2. This study finds that the level of infrastructure disclosure is not related to whether the entities are general government entities or government business enterprises. However, it is related to the types of infrastructure provided by the entities. Entities providing economic infrastructure, including transport, water and electricity have a higher level of disclosure than entities providing social infrastructure, including housing, recreational facilities etc.. Thus, users' information needs are better met by entities providing economic infrastructure.

3. The level of infrastructure disclosure is found to be significantly related to the interests of resource providers and parties performing an oversight function, but is not significantly related to the interests of recipients of goods and services. This suggests that the public sector entities have an incentive to disclose more infrastructure information in the interests of resource providers and parties performing an oversight function, rather than the recipients of goods and services.

4. The reporting practice of the public sector entities in relation to the disclosure of infrastructure information does not meet the objective of general purpose financial reporting as stated in SAC 2 of the conceptual framework project. The objective is to provide useful information to users for decision making. However, the results of the tests in this study show that the public sector entities do not fully disclose those infrastructure information considered useful to users.

5. In relation to the user groups, the results of this study are also inconsistent with the conceptual framework project. SAC 2 identifies three groups of users to be the primary users of general purpose financial reports. But the results of this study indicate that only the interests of resource providers and parties performing an oversight function relates to the disclosure of infrastructure information. There is no significant relationship between the recipients of goods and services and the infrastructure disclosure.

## **6.4 Implications of the Results**

The implications of the above findings are discussed in this section. The implications are discussed on three main areas: accounting standards, the conceptual framework and the user groups.

The insufficient disclosure of infrastructure information suggests that means of reducing the extent of such an undesirable situation need to be explored. Shand (1989, p.142) stated that “the need for standards in financial reporting is based on the need to provide information which is relevant”. This suggests that the extent of insufficiency in disclosure of infrastructure information could be reduced by accounting standards. At present, there is no accounting standard specifically regarding the disclosure of infrastructure. Although AAS29 requires the recognition of infrastructure as assets as discussed in section 2.4.3 earlier, it only provides regulation on the general disclosure by government departments.

Following this line of thought, the results of this study provide implications for the standard setting bodies and other regulatory bodies. Firstly, the results show that there is no significant difference in the level of infrastructure disclosure between general government entities and government business enterprises. It can be inferred that there is little fundamental difference between types of public sector entities for the purpose of disclosure of infrastructure information. This provides insights on the policy formulation on infrastructure reporting requirements. In particular, this study provides empirical evidence for standard setting bodies and regulatory bodies to

evaluate whether standardized reporting requirements on infrastructure should be applied to all types of government entities.<sup>10</sup>

Secondly, this study provides insights into areas where infrastructure reporting should be strengthened. The results facilitate evaluation on areas where users' information needs on infrastructure are not sufficiently met, both financial and non-financial information. Besides, it also helps to assess whether infrastructure reporting by entities providing social infrastructure should be strengthened.

The results of this study also provide implications for the conceptual framework project. The results show that the infrastructure disclosure practice by the public sector entities is not consistent with the objectives of the general purpose financial reporting, and not all the three groups of users as suggested in SAC 2 are served. Thus, means to reduce the extent of this inconsistency should be explored. For example, accounting standards on infrastructure reporting which is consistent with the conceptual framework should be developed so as to promote the achievement of the objective of general purpose financial reporting as set out in the conceptual framework project.

A further implication of this study is on the user groups. The results of this study show that the level of infrastructure disclosure relates to the interests of resource providers and parties performing an oversight function, but does not relate to the

---

<sup>10</sup>Macmillan (1982, p.6) addressed the issue of whether accounting standards should be developed independently for each type of government or for any particular combination of them.

interests of recipients of goods and services. This implies that public sector entities perceive as important resource providers and parties performing an oversight function for the purpose of infrastructure reporting. Thus, further research would be desirable to (1) provide empirical evidence on the relative importance of various user groups in the public sector, and (2) to provide feedback on the identification of user groups as set out in the conceptual framework project.

Rowles (1993, p.140), in concluding his discussion on the financial reporting of infrastructure by the public sector entities, stated that:

Accurate representation of infrastructure..... poses a number of practical and conceptual issues on which no consensus exists, and on which guidance is necessary.

On the whole, this study contributes by providing empirical evidence on the issues of infrastructure reporting by public sector entities.

## **6.5 Limitations**

Some of the limitations of this study need to be considered when analyzing the results of this study. One limitation relates to the generalizability of the results. This study examines the disclosure practice by public sector entities in New South Wales, thus the results of this study may not be generalized to the other states or to the whole country.

Another limitation relates to the measure of disclosure which is based on information considered useful by the literature. The measure may not adequately reflect the needs of various user groups. However, the collection of actual information demanded by users will require other research which is, due to the complexity of the issue, beyond the scope of this study. Thus, information based on various literature is considered to be a possible alternative and the disclosure items are selected after examining the relevant literature in sufficient detail.

Also, the scoring system used for the disclosure level is developed by reference to the relevant literature and a pilot test on the annual reports carried out to improve the validity of the data. A limitation of this scoring system is the assumption of equal weight for each item. However, there is no theoretical or empirical basis to assign weights to the items of information. To obtain an empirical basis would require other research on user needs as discussed above. This is again beyond the scope of this study. Even if the available time and resources permit the sending of questionnaire to measure the information needs, it is still subjected to the limitations on the design of the questionnaire and the ability of the respondents to provide the true value of the items of information. Buzby (1975, p.31) encountered such problems and stated that:

The meaning and significance of the relative disclosure scores were, of course, linked to the adequacy of the questionnaire used to measure the information needs..... The fact remains that even if the basic methodology was sound, some financial analysts may not have been able to gauge the true value of some of

the items of information. Unfortunately, the true values for many items of information remain to be proved empirically.

The system of using equal weight in scoring items was adopted by Nobes (1984, p.80) and considered acceptable. Thus, the assumption of equal weight is considered to be a feasible alternative for this study.

Further, in selecting the surrogates to represent the interests of user groups, only one surrogate is selected for each factor. This is due to the limited sample size which restricts the number of independent variables that can be used for statistical tests in order to have a stronger power of the test (Cohen and Cohen, 1983, p.116-118). This limitation is remedied by carefully considering the alternative variables. The reasons for selecting the surrogates were explained in Chapter 3. A different conclusion may be produced if the sample size can be increased and more independent variables used in future research.

## **6.6 Recommendations for Future Research**

Following the findings and limitations of this study, some possibilities for future research are recommended.

1. Research can be carried out to investigate the level of financial and non-financial infrastructure information actually needed by various user groups. This could include the types of infrastructure information and the ways of reporting. Research into this

area would be a valuable input into the setting of infrastructure reporting requirements based on user needs.

2. Another area is the relative importance of various user groups in the public sector. This could provide useful insight into whether any groups of users are particularly important in relation to infrastructure reporting, and provide empirical evidence to support previous literature on whether the citizen group is an infrequent user of government financial reports.

3. From the results of the study, it is found that entities providing economic infrastructure have a higher level of infrastructure disclosure than entities providing social infrastructure. Further research can be carried out to explore the reasons for the difference in the level of infrastructure disclosure between these types of entities.

4. Rowles (1992, pp.iii and 33) suggested that infrastructure may be operated by entities in private sector or in public sector, and that private and public sector report infrastructure in a different manner. This study only focus on the reporting in the public sector. Future research can be directed to the comparison in infrastructure reporting between private and public sector.

5. Rowles (1992, p.3) also suggested that diversity in infrastructure reporting practice exists both “between individual entities in the same jurisdiction and between different jurisdictions”. This study only examines the reporting practice by public sector entities within New South Wales. Thus, future research can be extended to the

comparison between states, and also at local government level which is a fruitful area for research into infrastructure reporting.

6. This study only examines at the disclosure level. However, the measurement of infrastructure is also a controversial issue which requires further research.

7. This study is a cross-sectional study. Time series study would be another useful area for future research to provide insights on whether or not the quality of infrastructure reporting has improved over time.

## APPENDIX 1

### List of Public Sector Entities Examined

Broken Hill Water Board	1992-93
Bush Fire Services, Department of	1992-93
Chipping Norton Lake Authority	1992-93
Cobar Water Board	1991-92
Conservation and Land Management, Department of	1992-93
Energy, Office of	1992-93
Fish River Water Supply Authority	1992-93
Greyhound Racing Control Board	1992-93
Harness Racing Authority of NSW	1992-93
Housing, Department of	1992-93
Hunter Catchment Management Trust	1992-93
Lake Illawarra Authority	1993-94
Maritime Services Board of NSW	1992-93
Newcastle International Sports Centre Trust	1992-93
NSW Dams Safety Committee	1992-93
NSW Government Telecommunication Authority	1992-93
Pacific Power (The Electricity Commission of NSW)	1992-93
Parramatta Stadium Trust	1992-93
Police Service of NSW	1992-93
Public Works Department	1992-93
Racecourse Development Committee	1992-93
Roads and Traffic Authority of NSW	1992-93
School Education, Department of	1992-93
South-West Tablelands Water Supply Authority	1992-93
Sport, Recreation and Racing, Department of	1992-93
State Forests of NSW	1992-93
State Rail Authority of NSW	1992-93
State Sports Centre Trust	1992-93
State Transit Authority	1992-93
Sydney Cricket and Sports Ground Trust	1992-93
Sydney Electricity	1992-93
Teacher Housing Authority	1992-93
Totalizator Agency Board of NSW	1992-93
Transport, Department of	1992-93
Upper Parramatta River Catchment Trust	1992-93
Water Board	1992-93
Water Resources, Department of	1992-93

*(Source: New South Wales Government Directory, 1994, First Edition.)*

**APPENDIX 2****Data Collection Form for Individual Entity**

<b>Name of Entity :</b>						
<b>Items</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>Remarks</b>
Capitalization of infrastructure in the Balance Sheet						
Valuation of infrastructure						
Cost of consumption/ renewal expenditure/ depreciation						
Maintenance expenditure						
Deferred maintenance						
Enhancement expenditure						
Budget and actual expenditure including estimated total cost of capital projects						
Replacement cycle and aging schedule						
Standard of service/ asset condition						
Anticipated infrastructure needs						
Capital project plans						
Infrastructure assets management plans						
Capacity level required and achieved						
Total score						
Type of entity						
Infrastructure type						
Total revenue						
Total Expenditure / Total revenue						
Total Liabilities / Total revenue						

**APPENDIX 3****Descriptive Statistics - Scores of Individual Disclosure Items**

<b>Items</b>	<b>Mean</b>	<b>Std Dev</b>	<b>Minimum</b>	<b>Maximum</b>
<b>Financial Information</b>				
Capitalization of infrastructure in the Balance Sheet	1.68	1.45	0	4
Valuation of infrastructure	1.78	1.49	0	4
Cost of consumption/ renewal expenditure/ depreciation	1.62	1.40	0	4
Maintenance expenditure	0.78	0.92	0	4
Deferred maintenance	0.08	0.28	0	1
Enhancement expenditure	0.35	0.82	0	4
Budget and actual expenditure including estimated total cost of capital projects	0.81	0.81	0	3
<b>Non-financial Information</b>				
Replacement cycle and aging schedule	0.08	0.49	0	3
Standard of service/ asset condition	1.59	1.40	0	4
Anticipated infrastructure needs	0.30	0.52	0	2
Capital project plans	1.43	1.28	0	4
Infrastructure assets management plans	1.57	1.56	0	4
Capacity level required and achieved	0.11	0.39	0	2

**APPENDIX 4****Frequencies - Scores of Individual Disclosure Items**

<b>Items</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
<b>Financial Information</b>					
Capitalization of infrastructure in the Balance Sheet	11	7	8	5	6
Valuation of infrastructure	11	6	6	8	6
Cost of consumption/ renewal expenditure/ depreciation	11	7	9	5	5
Maintenance expenditure	17	13	6	0	1
Deferred maintenance	34	3	0	0	0
Enhancement expenditure	29	5	2	0	1
Budget and actual expenditure including estimated total cost of capital projects	13	21	0	3	0
<b>Non-financial Information</b>					
Replacement cycle and aging schedule	36	0	0	1	0
Standard of service/ asset condition	12	8	2	13	2
Anticipated infrastructure needs	27	9	1	0	0
Capital project plans	10	12	8	3	4
Infrastructure assets management plans	14	6	6	4	7
Capacity level required and achieved	34	2	1	0	0



## APPENDIX 6

### Valuation Policies by Public Sector Entities Examined

Most of the public sector entities examined in this study adopted written down replacement values for infrastructure assets. Other valuation basis as indicated in the financial statements included market value, management valuation, independent valuation and historical costs. The followings are some of the interesting notes found in the financial statements examined.

“The valuation policies developed provide for roads and bridges to be valued using the written-down replacement method..... This valuation method has been adopted because it reflects the current minimum economic valuation of the infrastructure.”

“In respect of land under roads and within road reserves, valuations were assessed according to the average rateable value per hectare of urban and rural areas within each Local Government Area.”

“Buildings which are given an ‘essential’ status such as Police Stations are valued at replacement cost.”

“The major assets..... comprised of storage dams, pipelines, reservoirs, pumping stations and mains, are all regarded as being an integral part of the water supply system, without having any potential alternative use and therefore no resale value, thus there is no requirement for the inclusion of a market value for these assets.”

“The Authority, being a not-for-profit entity, is not required to apply the recoverable amount provisions of Accounting Standard AAS10 ‘Accounting for the Revaluation of Non-current Assets’ when valuing non-current assets. This is because the service potential of the Authority’s non-current assets is more related to the provision of services, including community service obligations, than the generation of net cash inflows.”

“Under Section 5(1)(a)(ii) of the Public Finance and Audit (Statutory Bodies) Regulation, 1985..... is not required to include the market value of pipelines, reservoirs, pumping stations and mains etc, as these assets are regarded as being an integral part of the water supply system, with no alternative use and therefore no resale value.”

## BIBLIOGRAPHY

- Accounting Standards Review Board (1990), ASRB Release 100 *Nature of Approved Accounting Standards and Statements of Accounting Concepts and Criteria for the Evaluation of Proposed Approved Accounting Standards*, August.
- Attmore, R.H., Miller, J.R. and Fountain, J.R. (1989), "Governmental Capital Assets: The Challenge to Report Decision-Useful Information", *Government Finance Review*, August, pp.13-17.
- Australian Accounting Research Foundation (1990), *Statement of Accounting Concepts SAC 1 Definition of the Reporting Entity*, August.
- Australian Accounting Research Foundation (1990), *Statement of Accounting Concepts SAC 2 Objective of General Purpose Financial Reporting*, August.
- Australian Accounting Research Foundation (1990), *Statement of Accounting Concepts SAC 3 Qualitative Characteristics of Financial Information*, August.
- Australian Accounting Research Foundation (1992), *Statement of Accounting Concepts SAC 4 Definition and Recognition of the Elements of Financial Statements*, March.
- Australian Accounting Research Foundation (1992), *Definition, Recognition and Measurement of Non-current Physical Assets by Public Sector Reporting Entities: A Guide to Applying Professional Pronouncements*.
- Australian Accounting Research Foundation (1993), *Australian Accounting Standard AAS29 Financial Reporting by Government Departments*, December.
- Australian Bureau of Statistics (1987), *Standard Institutional Sector Classification of Australia*.
- Australian Bureau of Statistics (1990), *Australian National Accounts, Concepts, Sources and Methods*, May.
- Australian Bureau of Statistics (1993), *Government Finance Statistics, Australia, 1992-93*.
- Australian Society of Accountants and The Institute of Chartered Accountants in Australia (1983), *Statement of Accounting Practice SAP 1 Current Cost Accounting*, November.

- Australian Society of Accountants and The Institute of Chartered Accountants in Australia (1983), *Guidance Notes on Statement of Accounting Practice SAP 1 "Current Cost Accounting"*, November.
- Baber, W.R. and Sen, P.K. (1984), "The Role of Generally Accepted Reporting Methods in the Public Sector: An Empirical Test", *Journal of Accounting and Public Policy*, Vol. 3, pp.91-106.
- Banker, R. D., Cooper, W.W. and Potter, G. (1992), "A Perspective on Research in Governmental Accounting", *The Accounting Review*, Vol. 67, No. 3, July, pp.496-510.
- Boyett, A. and Giroux, G. (1978), "The Relevance of Municipal Financial Reporting to Municipal Security Decisions", *Governmental Finance*, May, pp.29-34.
- Burns, P. (1987), "Asset Management and Replacement in Government", *Contemporary Readings in Accounting and Auditing*, Guthrie, J., Parker, L and Shand, D., 1990, Harcourt Brace Jovanovich, Sydney, pp.117-123.
- Burns, P. (1989), "A Matter of Maintenance", *Chartered Accountant*, March, pp.14.
- Burns, P. (1993), "Condition-based depreciation for infrastructure assets", *Readings in Accounting Developments in the Public Sector 1992-93*, Australian Society of Certified Practising Accountants' Public Sector Accounting Centre of Excellence, pp.89-104.
- Buzby, S.L. (1974), "Selected Items of Information and Their Disclosure in Annual Reports", *The Accounting Review*, July, pp.423-435.
- Buzby, S.L. (1975), "Company Size, Listed Versus Unlisted Stocks, and the Extent of Financial Disclosure", *Journal of Accounting Research*, Spring, pp.16-37.
- Byrkit, D.R. (1987), *Statistics Today, A Comprehensive Introduction*, The Benjamin/Cummings Publishing Company, Inc., Menlo Park, California.
- Carpenter, G.J. (1986), "Accrual Accounting - Issues and Policy Implications for Departments and Non-business Government Entities", *Contemporary Readings in Accounting and Auditing*, Guthrie, J., Parker, L and Shand, D., 1990, Harcourt Brace Jovanovich, Sydney, pp.163-180.
- Cheng, R.H. (1992), "An Empirical Analysis of Theories on Factors Influencing State Government Accounting Disclosure", *Journal of Accounting and Public Policy*, Vol.11, pp.1-42.
- Churchill, M. (1992), "Public Sector Asset Valuation", *Australian Accountant*, April, pp.35-39.

- Churchill, M. (1992a), "Asset Valuation Methods", *Australian Accountant*, May, pp.30-34.
- Cohen, J. and Cohen, P. (1983), *Applied Multiple Regression/Correlation Analysis for the Behavioral Sciences*, second edition, Lawrence Erlbaum Associates, Publishers, New Jersey, London.
- Currie, B. (1987), "Accounting For Infrastructure Assets", *Public Finance and Accountancy*, Vol.8, May, pp.7-10.
- Daniels, J.D. and Daniels, C.E. (1991), "Municipal Financial Reports: What Users Want", *Journal of Accounting and Public Policy*, Vol.10, No.1, Spring, pp.15-38.
- Emerson, J.D. and Stoto, M.A. (1983), "Transforming Data", *Understanding Robust and Exploratory Data Analysis*, Hoaglin, D.C., Mosteller, F., and Tukey J.W., John Wiley & Sons, Inc., New York, pp.97-127.
- Emory, C.W. and Cooper, D.R. (1991), *Business Research Methods*, 4/e., Irwin, Homewood, Boston.
- Engstrom, J.H. (1985), "Long Term Assets and Liabilities With Emphasis on Infrastructure and Pensions", *Research in Governmental and Non-profit Accounting*, Chan, J.L., Vol.1, pp.297-305.
- Evans, J.H. and Patton, J.M. (1983), "An Economic Analysis of Participation in the Municipal Finance Officers Association Certificate of Conformance Program", *Journal of Accounting and Economics*, Vol.5, pp.151-175.
- Evans, J.H. and Patton, J.M. (1987), "Signaling and Monitoring in Public-Sector Accounting", *Journal of Accounting Research*, Vol.25 Supplement, pp.130-158.
- Fellew, K. and Kelaher, M. (1991), "Managing Government the Corporate Way", *Australian Accountant*, April, pp.20-22.
- Firth, M. (1979), "The Impact of Size, Stock Market Listing, and Auditors on Voluntary Disclosure in Corporate Annual Reports", *Accounting and Business Research*, Autumn, pp.273-280.
- Fountain, J.R. (1987), "Examining Accounting and Financial Reporting for Capital Assets of Governmental Entities", *Government Accountants Journal*, Vol.36, Fall, pp.54-58.
- Fountain, J.R. (1987a), "Governmental Accounting: Where is it Heading", *Public Budgeting and Finance*, Winter, Vol.7, No.4, pp.95-103.

- Gaffney, M.A. (1986), "Consolidated Versus Fund-Type Accounting Statements: The Perspectives of Constituents", *Journal of Accounting and Public Policy*, Vol.5, pp.167-189.
- Giroux, G. and Deis, D. (1993), "Investor Interests and Government Accounting Disclosure", *Accounting, Auditing and Accountability Journal*, Vol. 6, No.1, pp.63-78.
- Green, C.B. (1987), "The Use and Usefulness of Governmental Financial Reports: The Perspective of Citizen-Taxpayer Organizations", *Research in Governmental and Nonprofit Accounting*, Chan, J.L., Vol.3, Part B, pp.189-213.
- Gujarati, D.N. (1988), *Basic Econometrics*, second edition, McGraw-Hill Publishing Company, New York.
- Hay, D. (1994), "Who Uses Public Sector External Reports? An Exploration", *Accounting Forum*, March, pp.47-65.
- Hay, L.E. and Antonio, J.F. (1990), "What Users Want in Government Financial Reports", *Journal of Accountancy*, August, pp.91-98.
- Henderson, S. and Peirson, G. (1989), *Issues in Financial Accounting*, fourth edition, Longman Cheshire Pty Limited, Melbourne.
- Ingram, R. and Copeland, R. (1982), "Municipal Market Measures and Reporting Practices: An Extension", *Journal of Accounting Research*, Autumn, pp.766-772.
- Ingram, R.W. (1983), "The Importance of State Accounting Practices for Creditor Decision", *Journal of Accounting and Public Policy*, Vol.2, pp.5-17.
- Ingram, R.W. (1984), "Economic Incentives and the Choice of State Government Accounting Practices", *Journal of Accounting Research*, Vol.22, No.1, Spring, pp.126-144.
- Jackson, N.J. (1989), "Financial Management Issues Facing State and Local Governments", *Government Accountants Journal*, Vol.38, Winter, pp.30-32.
- Kemmet, L. (1993), "Living With A Deficit: Indio, California", *Public Budgeting and Finance*, Summer, pp.104-113.
- Likierman, A. (1989), "Financial Reporting in the Public Sector", *Public Sector Accounting and Financial Control*, Henley, D., Holtham, C., Likierman, A., and Perrin, J., 3/e., Van Nostrand Reinhold (International).

- Macmillan, G.G. (1982), "The Role of Classification in Government Accounting", *Issues in Government Accounting, Proceedings of a Seminar on Government Accounting February 12, 1982*, Clift, R.C. and Harris, G.J., The University of Melbourne, Department of Accounting, pp.1-27.
- Marquardt, D.W. (1970), "Generalized Inverses, Ridge Regression, Biased Linear Estimation, and Nonlinear Estimation", *Technometric*, August, Vol.12, No. 3, pp.591-612.
- Marquette, P., Frank, G.B. and Wrege, W.T. (1988), "Changes in Governmental Fixed Asset Accounting: Opportunities for Practice Development", *Ohio CPA Journal*, Autumn, pp.11-16.
- Mautz, R.K. (1981), "Financial Reporting: Should Government Emulate Business?", *Journal of Accountancy*, August, pp.53-60.
- Mautz, R.K. (1988), "Monuments, Mistakes and Opportunities", *Accounting Horizons*, June, pp.123-128.
- Miah, N. (1989), "Problems with Profit-Based Accounting Measures in Public Sector Utilities", *Australian Accountant*, July, pp.75-80.
- Miah, N. (1990), "Towards Improved Financial Reporting", *Australian Accountant*, November. pp.60-69.
- Miller, M.C. and Islam, M.A. (1988), *The Definition and Recognition of Assets*, Accounting Theory Monograph No. 7, Australian Accounting Research Foundation.
- Moore, M.L. and Buzby, S. (1972), "The Quality of Corporate Financial Disclosure: A Comment", *The Accounting Review*, July, pp.581-586.
- Morris, M. (1993), "Government as Owner", *Accountants' Journal*, June, p.20.
- Neilson, J. (1993), "AAS27: Expensive and Unnecessary", *Charter*, March, pp.53-57.
- New South Wales Government Information Service (1994), *New South Wales Government Directory 1994*, First Edition.
- New South Wales Parliament (1993), *Government Finance Statistics Estimates 1993-94*, Budget Paper No. 6.
- New South Wales Treasury (1990), *Policy Guidelines For Valuation of Physical Non-current Assets in NSW Public Sector*, September.
- New South Wales Treasury (1991), *Financial Reporting Code Under Accrual Accounting for Inner Budget Sector Entities*, July.

- New South Wales Treasury (1994), *Guidelines for Capitalisation of Expenditure in the NSW Public Sector*, January.
- Nobes, C. (1984), *International Classification of Financial Reporting*, Croom Helm, London.
- Norusis, M.J. (1990), *SPSS Base System User's Guide*, SPSS Inc., Chicago, Illinois.
- Pallot, J. (1987), "Are Public Sector Assets Different?", *Accountants' Journal*, May, pp.41-45.
- Pallot, J. (1990), "The Nature of Public Assets: A Response to Mautz", *Accounting Horizons*, June, pp.79-85.
- Perrin, J. (1984), "Accounting for Public Sector Assets", *Issues in Public Sector Accounting*, Hopwood, A. and Tonkins, C., pp.61-84.
- Public Sector Committee, (1993), *Infrastructure Management and Financing in New South Wales: Vol.1: From Concept to Contract - Management of Infrastructure Projects*, July.
- Robbins, W.A. and Austin, K.R. (1986), "Disclosure Quality in Governmental Financial Reports: An Assessment of the Appropriateness of a Compound Measure", *Journal of Accounting Research*, Vol, 24, No.2, Autumn, pp.412-421.
- Rowles, T.R. (1991), "Infrastructure and Heritage Asset Accounting", *Australian Accountant*, July, pp.69-73.
- Rowles, T.R. (1992), *Financial Reporting of Infrastructure and Heritage Assets by Public Sector Entities*, Discussion Paper No. 17, Australian Accounting Research Foundation.
- Rowles, T.R. (1993), "Infrastructure and Asset Accounting: Sorting Out the Problem", *Journal of Corporate Management*, Vol.45, No.3, May/June, pp.137-140.
- Roy, J.P. (1988), "Government Reporting: The Big Picture", *CA Magazine*, April, pp.42-49.
- Scullion, B. (1989), "Financial Reporting by Government Departments - the NSW Situation", *Contemporary Readings in Accounting and Auditing*, Guthrie, J., Parker, L and Shand, D., 1990, Harcourt Brace Jovanovich, Sydney, pp.234-237.

- Shand, D.A. (1989), "Public Sector Accounting Standards - Progress on Implementation in Australia", *Contemporary Readings in Accounting and Auditing*, Guthrie, J., Parker, L and Shand, D., 1990, Harcourt Brace Jovanovich, Sydney, pp.139-154.
- Strelhoff, W.K. (1987), "General Standards for Government Financial Statements", *CA Magazine*, January, pp.45-50.
- Van Daniker, R.P. and Kwiatkowski, V. (1986), *Infrastructure Assets: An Assessment of User Needs and Recommendations for Financial Reporting*, Research Report, Governmental Accounting Standards Board.
- Walker, N. (1987), "Mirror Mirror - Public vs Private Rate of Return Reporting", *Australian Accountant*, February, pp.7-11.
- Wiseman, J. (1982), "An Evaluation of Environmental Disclosure made in Corporate Annual Reports", *Accounting, Organizations and Society*, Vol.7, No.1, pp.53-63.
- Wells, M.C. (1981), "Current Cost Accounting and the Public Sector Bodies", *Australian Accountant*, August, pp.511-515.