A MODEL FOR MEASURING FINANCIAL SUSTAINABILITY OF LOCAL AUTHORITIES: MODEL DEVELOPMENT AND APPLICATION

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ABSTRACT

A key element of local government management accounting is an accountability system driven by benchmarks and techniques to evaluate the financial sustainability of local authorities. The accountability entails measuring the financial sustainability status of local authorities in a systematic way. Local authorities can use the results of the evaluation to streamline their operations to improve performance and set budgeting priorities. This study develops a model that measures and ranks the financial sustainability of local authorities. The model is then used to measure and evaluate the financial sustainability of two local authorities in New Zealand. The features of the model are: a set of financial and non-financial ratios; benchmarks for the ratios; a scoring and grading system; and a trend analysis technique. The study contributes to extant literature on model development for evaluating the financial sustainability of local authorities.

Keywords: financial sustainability, local authorities, model, ratios, benchmark

INTRODUCTION

Financial sustainability of a local government is its ability to generate enough revenue to meet expenses and to continue providing services at levels and quality required by its local citizens (Carmeli, Yitzhak & Vinerski-Peretz, 2008; Dollery, Crase & Grant, 2011). However, financial unsustainability or financial distress of local governments has continued to be a worldwide phenomenon in the new millennium (Carmeli & Cohen, 2001; Carmeli et al., 2008; Dollery & Mounter, 2010; Honadle, 2003). The deterioration of the financial sustainability, particularly the ongoing operational deficits threatens the existence of many local authorities (Dollery & Mounter, 2010; Honadle, 2003). Hence, the financial failure of a local government is the failure of its financial management system (Carmeli et al., 2008) and is often interpreted as the inability of a local authority to increase its revenue to cover its expenses (Inman, 1995; Dollery & Mounter, 2010; Carmeli et al., 2008; Honadle, 2003). The causes of financial failures can be jurisdiction specific and can be related to minimal or negative revenue growth (Dollery & Mounter, 2010), declining local population that affects rates revenue (PWC, 2006), restriction on local revenue-raising activities (Dollery et al., 2008; Shah, 2006a; 2006b), lack of financial management skills (Carmeli et al., 2008), increasing demands for service provisions by local citizens (Honadle, 2003), and flawed co-operation between central and local government (Carmeli et al., 2008; Carmeli & Cohen, 2001). The net result is the inability of a local authority to exist without deficits in their operating budgets which, if left unchecked, could spiral into a state of financial crisis (Access Economics 2007; Carmeli et al., 2008) and infrastructure backlogs (Dollery et al., 2007; 2008; Shah, 2006a; 2006b).

In response to the financial failures of local governments, there has been numerous calls for further research to develop measures of financial sustainability of local governments. Honadle (2003) suggests that maintaining a local government's fiscal health should be an ongoing process including regular assessment and steps to address early warnings of financial trouble. In public administration and management literature, Ferreira and Marques (2014) point to the need to measure and benchmark the overall performance of local governments. Local government activists involved in local politics and urban economy, have recognized the need for further research into the financial failures of local authorities (Honadle, 2003; Park,

2004). Carmeli et al. (2008) admit that there is a need for examining the causes of financial collapse of local governments and the means of resolving it. Such studies are important given local governments are very important providers of services that ensure the health, safety, well-being, and quality of life of local citizens (Honadle, 2003). However, due to the complexity of political, economic, social and community related factors, compounded by non-profit objective and service oriented nature of operations, efforts to evaluate the financial sustainability of local government still exist at an embryonic stage (Dollery et al., 2011). Further, the definition of financial sustainability has proved to be elusive (Dollery et al., 2006a) and too narrow (Dollery et al., 2006b). The lack of consensus on the meaning of financial sustainability is not surprising "given the complex multi-dimensional nature of local government with its democratic, economic, environmental, and social role in local service provision and local community life" (Dollery, et al., 2011).

A number of researchers have attempted to determine the meaning of local government financial sustainability and develop measures of financial sustainability (Carmeli, 2008; FSRB, 2005; Hoque & Adams, 2011; Johnsen, 1999; PWC, 2006). In spite of these research attempts, there is still a scarcity of studies that engage in designing a systematic and comprehensive model for measuring and evaluating the financial sustainability of local government as well as a model that could provide warning signals for impending financial failures. We respond to the call for further research by undertaking to develop a model that measures the financial sustainability of local authorities. The objective of the current study is to design a model for measuring and evaluating the financial sustainability of local authorities on the basis of a literature review of previous studies. The features of the model are: a measurement system comprising a set of financial and non-financial ratios; benchmarks for each ratio; a scoring system; a grading system; and a financial trend analysis technique. The model was then applied to measure the financial sustainability of two local councils in New Zealand: Waikato Regional Council, and Dunedin Council. The analysis of the councils is based primarily on publicly available information obtained from Statistics New Zealand, and annual reports of the councils. The findings indicate that the Waikato Regional Council is strongly sustainable while Denudin City Council is financially vulnerable. This study contributes to management accounting research in relation to performance evaluation and has practical

implications for local government. The contributions are elaborated in section 4 (Reflections).

The remainder of the paper is structured in the following manner. Section 2 presents literature review as a basis for developing a financial sustainability evaluating model and describes the features of the model. Section 3 describes the application of the model to measure the financial sustainability of two local councils in New Zealand. Section 4 provides reflections on the practical and theoretical implications of the financial sustainability model. Section 5 concludes the paper.

LITERATURE REVIEW AND MODEL DEVELOPMENT

The model development in this study is a process of identifying and selecting the features of financial sustainability from a review of previous studies. Prior studies tend to focus on particular features of financial sustainability. In this study, we have integrated a number of these features to provide a comprehensive measurement model. The model development begins with definitions of financial sustainability and related terms. We then discuss the factors affecting the financial sustainability of local authorities. These factors provide an interpretation of what comprises financial sustainability. The next stage is to translate the factors to financial and non-financial ratios that can be measured in quantitative terms to represent the financial sustainability of local authorities. Benchmarks are then established on the basis of the average ratios that were calculated using financial data of New Zealand local authorities for the period 2001–2010. A scoring system was designed comprising of scores -1 (unfavourable), 0 (warning), 1 (caution) and 2 (favourable). The scores were assigned for each ratio and for each local council. The total score for a particular year for each local council is then determined. On the basis of the total score a council is classified as strongly sustainable (score of 10 or more), moderately sustainable (5 to 9), minimally sustainable (1 to 4), financially vulnerable (0 to - 4) or financially unsustainable (-5 or less). A trend analysis technique was also used to provide insights on the trends in a council's performance for the period 2001–2010.

Definitions

Financial sustainability of a local authority is broadly defined by PWC (2006) as a local council's "ability to manage expected financial requirements and financial risks and shocks over the long term without the use of disruptive revenue or expenditure measures" (p.95). This means continuation of a council's present spending and funding policies given likely economic and demographic developments. In a similar vein, Fiscal Star (2009) considers financial sustainability as the ability of a local council to continue operating only if any operating deficit, infrastructure backlog or excessive net financial liabilities that presently exists could be corrected without the council having to resort in the future to substantial adjustments of its existing revenue and/or expenditure. To be financially sustainable a local council should be able to optimize its resources and capabilities to best shape its local community in the long term (SOI, 2011[1]). The financial sustainability of a local government depends on a myriad of factors including the weather and natural disasters, the economic health of the nation, and surrounding states, the local tax base, the tax environment in nearby states, demographic changes, labour costs, citizen demand for services, and the discretionary decisions of local officials (Honadle et al., 2004). These factors affect one or more aspects of a local government's financial health such as revenues, expenditures, operating position, and debt structure (Honadle et al., 2004). Other terms which have been used to denote financial sustainability include fiscal sustainability (Access Economics, 2007); financial condition (Wang et al., 2007; Groves et al., 1981); fiscal health (Honadle et al., 2004; Hendrick, 2004); and financial health (Barreca, 2010)

Factors Affecting Financial Sustainability of Local Authorities

The International City/County Management Association (ICMA) (2003) categorized the factors affecting financial condition of a local government into three groups: environmental, organisational and financial factors as delineated in Table 1. Honadle et al. (2004) reaffirmed and elaborated on the factors (Table 2) highlighted by ICMA.

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1   SOI Project is a key initiative of the Tasmanian Government to drive sustainability reform and performance improvement, and to support and encourage councils to do the same. Developing the financial sustainability indicators is a major part of the SOI Project.

Table 1: ICMA Model

Environmental Factors	Organisational Factors	Financial Factors
Community Needs and Resources	Management Practices	Revenues
Intergovernmental Constraints	Local Policy Choices	Expenditures
Disaster Risk		Operating Position
Political Culture		Debt Structure
External Economic Conditions		Unfunded Liabilities
		Condition of Capital Plant

Source: *Adapted from Evaluating Financial Condition: A Handbook for Local Governments. ICMA, (2003)*

Table 2: Modified version of the ICMA model

Classification	Factor
Environmental factor	Community needs and resources, intergovernmental constraints, disaster risk, political culture, external economic conditions, diverse service needs, city size and economic prosperity, gross domestic product, population, real estate values, tourist development and whether the city hosts the prefecture capital, local GDP, property value and wealth, and damage estimates from recent clean-up and emergency operations of natural disasters, social deprivation, demographic characteristics, residents' socioeconomic status, federal budget, health care reform (including Medicaid), welfare reform, federal mandates and regulations, federal government's policies, changing demographics, snowstorms, drought, flooding, earthquakes, and other emergencies that wreak havoc.
Organisational factor	Management practices, local policy choices, perceived organisational reputation, fiscal slack, relativity of components within major structural areas, current operating conditions, and future financial obligations.
Financial factor	Revenues, expenditures, operating position, debt structure, unfunded liabilities, condition of capital plant, classes of financial ratios, road maintenance costs, revenue generating capacity, tax and expenditure limitations

Source: *Adapted from Honadle et al. (2004)*

Financial and Non-Financial Ratios

In the current study, the environmental, organisation and financial factors are translated and measured in terms of ratios in order to gauge the overall financial sustainability of a local council. The ratios are quantitative measures and indicate a balanced representation of a local government's overall financial condition (Wang et al., 2007; Cohen, 2008; Barreca, 2010; Mitchell, 2011). The ratios provide a logical interpretation and provide signals regarding the financial health of local authorities. In our financial sustainability evaluating model, a set of thirteen financial and non-financial ratios have been adopted to represent the five dimensions of financial sustainability: financial management, liquidity, financial structure, performance and demography. The ratios that define each dimension are outlined in Table 3. The paragraphs that follow provide descriptions of each dimension.

Table 3: Ratio Definitions

Dimension	Ratio	Calculation
Financial Management (Profitability)	01 Profit Margin Ratio	Net surplus (deficit) divided by total revenues
Liquidity	02 Current ratio	Current assets divided by current liabilities
	03 Operating cash flow to total revenue ratio (OCF/TR)	Operating cash flow divided by Total revenue
Financial structure	04 Interest coverage ratio	Net surplus (deficit) divided by Interest expense
	05 Debt-total asset ratio	Total Liabilities divided by Total Assets
	06 Net Debt- total revenue ratio (ND/TR)	Total liabilities less financial assets (cash and cash equivalents) divided by operating income
Performance	07 Rates coverage	Total rates revenue divided by total expenses
	08 Rates revenue to total revenue ratio (RR/TR)	Total rates revenue divided by total revenue
	09 Asset turnover	Total revenues divided by total asset
	10 Net interest expense ratio	(interest expense-interest income on unrestricted cash & securities) divided by operating revenue

Dimension	Ratio	Calculation
Demographic	11 Population growth	Population change over two years
	12 Population Density	Population divided by area
	13 Dwellings per capita	Dwellings divided by population

Financial Management

The financial management dimension indicates whether councils have achieved or are improving their financial sustainability through fiscal management (SOI, 2011). Profitability is not a primary goal in local government; however, the existence of a reasonable surplus is essential in order for a council to have sufficient funds to finance its long-term capital investments (Cohen, 2008; Barreca, 2010). The profit margin ratio is viewed as being able to provide an insight into the efficiency in the use of resources and the ability of management to finance growth. Cohen (2008) argues that a small positive value for the profitability ratio can be considered as a positive result for councils. Large negative values, especially when persistent, are indications of significant unfavourable financial prospects. Two factors need to be considered in interpreting the financial management ratio for local councils. First, as a result of mainly free services provided by councils, consumers may have relatively little incentive to be concerned with the associated costs or the possibility that too much is being produced. Second, return on capital is not considered as a cost to be recovered through local government taxes. Therefore profitability per se is not a concept relevant to tax-funded activities of local authorities (FSRB, 2005) though they are necessary to fund long term investments.

Liquidity

Liquidity ratios are indicators of a council's ability to pay its short-term obligations. A low liquidity ratio may result in cash flow problems which would require greater use of short term borrowing to cover expenses (Cohen, 2008). Liquidity of local councils can be measured by the current ratio and operating cash flow to total revenue ratio. The current ratio assesses the council's ability to pay back its short-term liabilities with its short-term assets. The higher the current ratio the higher is the capability of a council to pay its short-term obligations. A current ratio under 1 suggests that the council would be at a relatively unfavourable liquidity (ICMA, 2003; PWC,

2006; Cohen, 2008; Barreca, 2010). Operating cash flow to total revenue ratio indicates the percentage total revenue reserved as operating cash flow and the ability to pay bills and short-term debts. Cash surplus is a financial measure which shows the financial resources available for subsequent periods (Brusca & Montesinos, 2013).

Financial Structure

The financial structure dimension evaluates the way a council has financed its assets in the long run. The three ratios that represent financial structure are: debt to total asset ratio, net debt to total revenue ratio and interest coverage ratio. Debt to total asset ratio measures a council's financial risk by determining how much of the council's assets have been financed by debt. Net debt to total revenue is a council's total liabilities minus its financial assets, expressed as a percentage of total operating revenue (Fiscal Star, 2009). Interest coverage ratio indicates councils' ability to pay interest on their outstanding debt. According to PWC (2006), when the value of a council's interest coverage ratio is below 3, the councils' ability to meet interest expenses is questionable. An interest coverage ratio below 1 indicates the council is not generating sufficient revenues to meet interest expenses.

Performance

The performance dimension consists of four ratios including rates coverage ratio, rates revenue to total revenue ratio, asset turnover and net interest expense ratio. Rates coverage ratio indicates a council's ability to cover its costs through its own tax revenue. According to the benchmark established by PWC (2006), a value of 40 per cent or higher represents a financially sustainable outcome. This means rates income is able to provide an adequate revenue stream to meet expenses. Conversely, a ratio of less than 40 per cent indicates that rates revenue is not sufficient to cover expenses adequately and may result in financial unsustainability. Rates revenue to total revenue ratio indicates the percentage of total revenue generated from council's rates revenue. Rates revenue is the primary source of local councils' revenue in New Zealand representing 41.79 per cent of total revenue in 2010. Therefore, rates coverage ratio and rates revenue to total revenue ratio are essential to measuring and evaluating the financial

sustainability of local councils. The assets turnover ratio measures the efficiency in the use of assets in generating revenue within councils and has been adopted by several studies (see, for example, Cohen, 2008; Barreca, 2010; Fiscal Star, 2009). Net interest expense ratio is a measure that is frequently adopted by studies conducted by Access Economics (2007) in order to measure a council's debt burden.

Demographic

The demographics of a council have significant impact on its financial sustainability and performance (Andrews et al., 2005; Cohen, 2008; Barreca, 2010; FSRB, 2005; Carmeli, 2003; Andrews, 2004; Honadle et al., 2004). The financial attractiveness of an area and its growth opportunities may vary depending on its geographical location, its political significance, its local tax base and its vicinity to resources. In the current study three indicators are used to assess the demographic impact on the financial sustainability of local councils. First, population growth is an indicator that measures population change over two-year period based on New Zealand census. A population decrease is generally considered to have negative impact on financial sustainability of a council. Second, population density is a measurement of population per square kilometre. This provides insight on how many citizens live in a particular area and the infrastructural efficiency of a council's service provisions. Third, population to dwelling ratio reflects the wealth of a local council area.

Benchmarks

A number of studies have adopted benchmarking as a basis for measuring local council financial sustainability (Access Economics, 2007; PWC 2006; Fiscal Star, 2009; FSRB, 2005). Benchmarking highlights the relative strengths and weaknesses of a local council and indicates areas that may require investigation and corrective action. Benchmarks for our financial sustainability evaluating model were established with reference to several prior studies (Brown 1993; Kloha et al., 2005; FSRB, 2005). To establish the benchmarks for the 13 ratios three steps were followed. First, all 86 New Zealand local councils were categorised into four population groups on the basis of the following criteria:

1. Group 1: councils with population over 100,000
2. Group 2: councils with population between 50,000 and less than 100,000
3. Group 3: councils with population between 20,000 and less than 50,000
4. Group 4: councils with population below 20,000

Second, the 10 financial ratios for each council were computed (using the definitions in Table 3) for a 10 year period from 2001 to 2010. All data required for the ratios were derived from Statistics New Zealand and the annual reports of the local councils. The types of financial data used in this study is summarised in Table 4. The three demographic ratios were calculated for a 5 year period from 2006 to 2010 as they were the most recent data available.

Table 4: Financial Data Analysed, New Zealand Local Councils

Category	Items Examined
Annual Revenue Items	Operating income, rates, interest income, total income
Annual Expense Items	Operating expenditure, interest expenditure, total expenditure
Other Operating Statement Items	Net operating surplus (deficit)
Balance Sheet Items	Current assets, current liabilities, cash, total assets, total liabilities, cash equivalents.

An average value for each ratio was calculated for the period 2001-2010. Third, with reference to Brown (1993), each group of councils was then subdivided into four quartiles based on a descending order of ratio value. Each quartile consists of 25 percentage of the councils in a given population group. The above three steps were applied to all 13 ratios. A notable feature is that the benchmarks established for the same ratio across the four groups were different. This design is a result of several prior studies pointing out that population diversity as an important factor affecting local government financial sustainability (Honadle et al., 2004; Brown, 1993). Appendix A shows the benchmarks for all 13 ratios and quartiles for each population group. A comparison can also be made with the national average of the ratios for each quartile and the group average. Such comparison would

provide additional insights on the financial sustainability of the councils relative to the national and group averages.

Scoring System

The scoring system in the financial sustainability evaluating model comprises of three major components. First, each ratio is assigned a score that ranges from -1 to +2 depending on its value in the group. Councils with ratios in quartile 1 or 2 are assigned scores of 2 or 1 whereas councils with ratio values in quartile 3 or 4 are assigned scores of 0 or -1 respectively (Appendix A). It is important to note that most ratios which are favourable fall in either quartile 1 or 2 and will be assigned +2 or +1 scores. However, there are several exceptions as some ratios are favourable if their value is low. For example, for debt to total asset ratio, net debt to total revenue ratio and net interest expense ratio, quartile 1 and 2 councils are assigned scores of -1 and 0 whereas quartiles 3 and 4 are assigned scores of 1 and 2 respectively.

As for the profitability margin ratio, large positive profitability is generally considered unfavourable in local councils since profitability is not the primary goal of a local government and large amounts of profitability may indicate local revenues have not been fully utilised to provide services to local communities. Therefore, a score of 0 is assigned to councils which fall in quartile 1, a score of 1 for quartile 2 councils and a score of 2 for quartile 3 councils. For councils which fall in quartile 4 a score of -1 is assigned to indicate an unfavourable value. The set of benchmarks and assigned scores incorporated in the model are summarised in Appendix A. A financial sustainability worksheet (Appendix B) provides a systematic format of computing the total and individual ratio scores of a local council. The overall score that ranges from -13 to +26 are summed and shown in section E of the worksheet.

Grading System

Kloha et al. (2005), points out that a local councils' financial sustainability can be classified into different levels. In line with this recommendation we have incorporated two grading systems in our model. First, the model ranks a council's performance for each ratio in one of the

categories: favourable, caution, warning or unfavourable (Table 5). Second, a council's overall financial sustainability is ranked as being strongly sustainable, moderately sustainable, minimally sustainable, vulnerable or unsustainable (Table 6). The grading was developed with reference to FSRB (2005) which has classified the different levels of financial sustainability into four categories as shown in Table 7. The grading is intended to provide early warning signals about the financial sustainability of local councils especially if a particular ratio is approaching towards unfavourable grading or the overall financial sustainability of a council is financially unsustainable.

Table 5: Grading System for Individual Ratios

Score	Rating
2	Favourable (F)
1	Caution (C)
0	Warning (W)
-1	Unfavourable (U)

Table 6: Grading System for overall Financial Sustainability

Overall Score	Grading
Less than – 4	Financially Unsustainable (U)
-4 to < 1	Financially Vulnerable V)
1 to < 4	Minimally Sustainable (M)
4 to < 10	Moderately Sustainable (D)
10 or above	Strongly Sustainable (S)

Table 7: FSRB Categories of Financial Sustainability

Grading	Definition
Unsustainable	A local council with a very limited capacity to meet its short-term financial commitments and no capacity to meet its medium to long-term financial commitments. Major revenue and expense adjustments and structural reform will be required to be able to manage unforeseen financial shocks and any adverse changes in its business and in general economic conditions.
Vulnerable	A local council with a limited capacity to meet its financial commitments in the short-term and medium-term and a very limited capacity long-term. Without some structural reform and major revenue and expense adjustments, it is highly unlikely to be able to manage unforeseen financial shocks and any adverse changes in its business and in general economic conditions.
Minimally Sustainable	A local council with an acceptable capacity to meet its financial commitments in the short to medium-term and a limited capacity in the long-term. Without the need for significant revenue or expense adjustments, it is unlikely to be able to manage unforeseen financial shocks and any adverse changes in its business and in general economic conditions.
Moderately Sustainable	A local council with a high capacity to meet its financial commitments in the short, medium and long-term. It is likely to be able to manage major unforeseen financial shocks and any adverse changes in its business and in general economic conditions with only minor revenue or expense adjustments. Its capacity to manage core business risks is strong.
Strongly Sustainable	A council with a very high capacity to meet its financial commitments in the short, medium and long-term. It is highly likely to be able to manage major unforeseen financial shocks and any adverse changes in its business and in general economic conditions without revenue or expense adjustments. Its capacity to manage core business risks is very strong.

Financial Trend Analysis Technique

A final feature incorporated in the model is a trend analysis to trace the financial sustainability of a council. The trend analysis identifies specific areas where new policies should be implemented or existing ones revised. Application of this analysis involves the following steps:

1. Identifying unfavourable financial trends with respect to each individual ratio
2. Determining when the unfavourable trend starts
3. Identifying the causes underlying the unfavourable trend
4. Comparing the ratio trends to one another
5. Determining whether further analysis is required
6. Taking other relevant factors into account

In summary, the key features (Appendix C) of the financial sustainability evaluating model consist of the following:
1. Financial and non-financial ratios
2. Benchmarks for the financial and non-financial ratios
3. Scoring system
4. Grading system
5. Trend analysis technique

MODEL APPLICATION AND ANALYSIS

It is beyond the scope of this paper to present the analysis of every New Zealand local council. The primary purpose of this paper is to describe the features and illustrate the application of the financial sustainability evaluation model. This section describes how the model was applied to measure and evaluate the financial sustainability of two New Zealand local councils in Group 1 population category: Waikato Regional Council which has the highest total score of 13; and Dunedin City, the council with the lowest total score of -2. A worksheet was prepared for each council using data derived from 2001-2010 financial statements and the findings are reported in subsections 3.1 and 3.2 below.

Waikato Regional Council

Table 8 shows the financial sustainability analysis of Waikato Regional Council which has the highest total score of 13 in 2010. The strongly sustainable grading of the council is mainly due to its low level of debt and high level of income generated from its rates revenue. The council has a debt to asset ratio of only 4.04% which is significantly lower than the Group 1 Average of 10.45 per cent, but higher than the National Quartile Average

of 2.63%. The net debt to total revenue ratio of the council is - 3.48% indicating its total liabilities are less than its financial assets (i.e., cash or cash equivalents). The ratio is significantly lower than Group 1 Average of 112.86% and the National Quartile Average of 14.98%. The rates coverage ratio indicates that 72.34% of the total expenses have been covered by the council's rates revenues, much higher than Group 1 Average of 52.53% and National Quartile Average of 65.06%. This indicates that rates revenue of the council is able to adequately cover its costs. Similarly, rates revenue to total revenue ratio also shows a higher ratio of 57.58% compared to Group 1 Average of 44.10% and National Quartile Average of 54.70%. Further, the asset turnover ratio of 23.05 % is much higher than the Group 1 and National Quartile Averages and indicates the efficient use of assets within the council. The 2010 analysis shows that Waikato Regional councils' financial sustainability could be further improved in several areas. First, the value of its profit margin ratio of 20.40% in 2010 is too high in comparison the Group 1 Average of 13.56%. The surplus could be utilised to increase the level of services provided by the council as well as finance projects that would benefit the local community. Another aspect for improvement is the council's population to dwelling ratio of 2.37 which is below Group 1 Average of 2.51.

Table 8: Waikato Regional Council Financial Sustainability Analysis 2010

Ratio	Value 2010	Score 2010	Grading 2010	2010		2001 – 2010	
				Group 1 Average	National Quartile Average	Group 1 Average	National Quartile Average
01 Profit margin ratio	20.40%	0	Warning	13.56%	22.26%	11.29%	21.69%
02 Current ratio	1.93	1	Caution	2.24	1.88	2.17	1.95
03 Operating cash flow to total revenue ratio	20.39%	1	Caution	15.02%	17.22%	18.80%	15.94%
04 Interest coverage ratio	6.14	1	Caution	28.69	8.73	22.69	11.97

Ratio	Value 2010	Score 2010	Grading 2010	2010		2001 – 2010	
				Group 1 Average	National Quartile Average	Group 1 Average	National Quartile Average
05 Debt to total asset ratio	4.04%	2	Favourable	10.45%	2.63%	7.76%	2.2%
06 Net debt to total revenue	-3.48%	2	Favourable	112.86%	14.98%	61.82%	-5.23%
07 Rates coverage ratio	72.34%	2	Favourable	52.53%	65.06%	52.84%	67.31%
08 Rates revenue to total revenue ratio	57.58%	2	Favourable	44.10%	54.70%	46.44%	59.67%
09 Asset turnover	23.05%	2	Favourable	14.82%	16.86%	14.53%	16.41%
10 Net interest expense ratio	-0.87%	0	Warning	0.10%	2.45%	-0.75%	0.86%
11 Population growth	1.20%	1	Caution	1.21%	1%	1.19%	0.88%
12 Population density	15.99	0	Warning	345.89	12.19	336.21	11.99
13 Population to Dwelling ratio	2.37	-1	Unfavourable	2.51	1.98	2.5	1.97
Total Score and Grading		13	Strongly Sustainable				

The trend analysis for the period 2001–2010 for Waikato Regional Council is shown in Appendix D. Profit margin is consistently unfavourable (score of -1) for all years except for 2010 with a warning signal (score of 0). The current ratio trend signals warning for the period 2001–2005, but

has improved to a favourable trend for the period 2006–2010. The operating cash flow ratio trend has significantly improved to a favourable trend for the period 2006–2010 from an unfavourable trend in the prior period 2003–2005. The trend for financial structure appears strong. In particular, the council has maintained a favourable gearing ratio for the period 2008–2010. The trend for net debt to total revenue ratio is mainly a caution ranking, but a marked improvement to favourable in 2010. However, the trend for interest coverage ratio suggests a weakening pattern and could be due to increasing interest expenses or decreasing profitability or a combination of both. In the performance dimension, in terms of rates coverage and rates revenue to total revenue, the council shows a consistently favourable trend for the period 2006–2010. The asset turnover has a slightly fluctuating trend indicating a caution signal for the period 2001–2003; peaking during 2004–2007; before sliding back to caution for the period 2008–2010. The demographic ratios are the primary concern of the council as the ratios do not show favourable trends. In particular the population to dwelling ratio has been consistently unfavourable throughout the period 2006–2010. This is mainly due to low population growth and population density in the Waikato region. Low demographic ratios and consistently favourable rates revenue ratios indicate that the council could be exerting increasing rating pressure on rate payers which could lead to a 'rating revolt' in the future. The overall sustainability grading for the council ranges from moderately sustainable (MDS) to strongly sustainable (SS) with two years being minimally sustainable (MIS). In 2010 the total score of 13 and strongly sustainable grading have been achieved primarily through rates revenue. It is doubtful whether the council could maintain such a grading in the future with low population growth and density.

Dunedin City

Table 9 provides the financial sustainability analysis for Dunedin City, the council with the lowest total score of -2 (financially vulnerable) in 2010. The analysis shows several areas of concerns. First, liquidity is a concern with current ratio of 0.54 and operating cash flow to total revenue ratio of 0.44% being significantly lower than Group 1 and National Quartile Averages. The low current ratio indicates that the councils' ability to satisfy its current obligations is relatively weak. The unfavourable operating cash flow to total revenue ratio can be attributed to limited revenue sources and a

substantial decline in the council's cash and bank deposits from $8.5 million in 2009 to $1.3 million in 2010. The financial structure of the council shows a highly geared position, with a warning grading for interest coverage ratio of 3.95 (Group 1 Average 28.69 and National Quartile Average 4.34); an unfavourable debt to total asset ratio of 10.45% (as compared to the bench marks Group 1 Average 7.76% and National Quartile Average 10.08%) though in par with Group 1 Average and performing slightly better than National Quartile Average of 12.81%; and an unfavourable net debt to total revenue ratio of 163.13% (Group 1 Average 112.86% and National Quartile Average 185.43%). The council also has an unfavourable rates revenue to total revenue ratio of 32.86% (Group 1 Average 44.10% and National Quartile Average 36.49%); a relatively low rates coverage ratio of 47.01% (Group 1 Average 52.53% and National Quartile Average 52.56%); and with inefficient asset management indicated by a caution grading for asset turnover ratio of 10.32% (Group 1 Average 14.82%) though showing a better performance compared to National Quartile Average of 9.90 %. Low population growth of 0.80% (Group 1 Average 1.21%) and population density of 37.37 ((Group 1 Average 345.89) contributed to relatively low rates revenue although this is partially compensate by a dwelling ratio 2.53 which is slightly higher than Group 1 Average (2.51 and National Quartile Average (2.46).

Table 9: Dunedin Council Financial Sustainability Analysis 2010

Ratio	Amount 2010	Score 2010	Grading 2010	2010		2001 – 2010	
				Group 1 Average	National Quartile Average	Group 1 Average	National Quartile Average
01 Profit margin ratio	30.11%	0	Warning	13.56%	4.09	11.29%	21.69%
02 Current ratio	0.54	0	Warning	2.24	0.89	2.17	1.26%
03 Operating cash flow to total revenue ratio	0.44%	-1	Unfavourable	15.02%	1.77%	18.80%	2.95%
04 Interest coverage ratio	3.95	0	Warning	28.69	4.34	22.69	3.97

Ratio	Amount 2010	Score 2010	Grading 2010	2010		2001 – 2010	
				Group 1 Average	National Quartile Average	Group 1 Average	National Quartile Average
05 Debt to total asset ratio	10.45%	-1	Unfavourable	10.45%	12.81%	7.76%	10.08%
06 Net debt to total revenue	163.13%	-1	Unfavourable	112.86%	185.43%	61.82%	121.06%
07 Rates coverage ratio	47.01%	0	Warning	52.53%	52.56%	52.84%	53.79%
08 Rates revenue to total revenue ratio	32.86%	-1	Unfavourable	44.10%	36.49%	46.44%	36.31%
09 Asset turnover	10.32%	1	Caution	14.82%	9.90%	14.53%	9.46%
10 Net interest expense ratio	-0.37%	0	Warning	0.10%	2.45%	-0.75%	0.86%
11 Population growth	0.80%	0	Warning	1.21%	0.65%	1.19%	0.41%
12 Population density	37.37	0	Warning	345.89	12.19	336.21	11.99
13 Population to Dwelling ratio	2.53	1	Caution	2.51	2.46	2.5	2.45
Total		-2	Financially Vulnerable				

The trend analysis for Dunedin City is shown in Appendix E. The profitability of the council has been fluctuating over the period 2001–2010 mainly with unfavourable trends. This has unfavourable effects on liquidity, especially the operating cash flows which has had an unfavourable trend since 2002. The ability of the council to meet its future interest commitments is questionable as the trend has fluctuated between unfavourable and

warning for the period 2006–2010. The financial structure appeared strong for 2001–2004 but the proportion of debt financing has increased during the period 2008–2010. The increase in financial gearing has translated into unfavourable trend in net debt to total revenue for the period 2008-2010. As for the trends in the performance dimension, the asset turnover has been consistently unfavourable during the period 2001–2009 indicating inefficient use of assets. The slight improvement of asset turnover to a caution grading in 2010 could be due to a proportionate decrease in asset rather than increase in revenue. This is further substantiated by the trends for rates ratios that have been ranked vulnerable or unfavourable for the period 2005–2010. A primary factor contributing to the financial sustainability woes of Dunedin City is the unfavourable trend in population growth and a warning trend in population density. There also appears to be no improvement in the population to dwelling ratio trend for the period 2006–2010. All these factors have caused the overall financial sustainability of the council to be ranked as vulnerable for the period 2007–2010 with negative total scores for each of the years during the period. In the earlier period (2001–2006) the grading had ranged between minimally or moderately sustainable.

REFLECTIONS

The financial sustainability evaluating model developed in the current study incorporates 13 ratios and provides an analytical format to score and rank in a systematic way the financial sustainability of local authorities. The model is built on a fundamental assumption that the benchmarks used for scoring and grading the local councils are contingent on the population group to which a council belongs. In terms of policy implications, the application of the model can lead to policy initiatives by both local authorities and central government.

Local councils with an unfavourable profit margin ratio may need to consider a number of measures such as austerity policy measures, privatization of services, raising revenue from non-traditional sources (such as joint ventures with private sectors), and requesting financial assistance from the central government, especially if natural conditions act to the detriment of a council's financial sustainability.

Local authorities with unfavourable liquidity need to consider policy measures to improve operating cash flows, current ratio and interest coverage ratio. Policy measures include strengthening financial structure through low financial gearing, substituting bank loans with central government loans: soft loans or subsidies. Adopting more robust collection procedures especially recovering overdue rates and taking action on defaulting rate payers.

In relation to the asset turnover ratio, the higher the ratio of revenue to assets the more efficient is the utilisation of the asset base. Efficiency can be enhanced by decreasing the assets needed to support any given level of activity or by maximizing the revenue gained from a certain level of assets, or a mixture of the two. Another approach is the outsourcing of service provision through public private partnerships (PPP) where competition motivates the private sector to provide services at higher levels of efficiency.

As for the demographic ratios, it is important for the central government to work together with local councils to implement development projects that could lead to population growth. In New Zealand, population growth and increased density tend to occur in metropolitan cities (like Auckland) and this typically gives rise to over congestion, rise in property prices and social problems. One option is for central government to take initiatives, in collaboration with the local authorities, to shift population growth to smaller and less developed districts. Development projects could take the form of infrastructure that helps to harness the natural benefits. Such development requires a great deal of financial assistance from the central government which would be essential if equality is to be attained allowing local communities throughout New Zealand to experience reasonable standards of services and welfare.

Interpretation of the scores and grading in the financial sustainability evaluating model must be undertaken with caution. An unfavourable financial sustainability score should not be interpreted as overly poor performance. In particular a score of -1 for a ratio may not imply that a council is making a loss or incurring a deficit but it means that the council's performance is below the performance of other quartiles in a particular group of councils. Comparison with the group average and national quartile averages would provide additional insights on financial sustainability of the councils

When interpreting the results of the financial sustainability analysis it is also important to consider the impact of factors that are external to the decision making units of local authorities. These non-discretionary or uncontrollable factors affect the efficiency of local authorities. They are exogenous and depend on national, regional and local conditions. While national conditions may affect the financial sustainability of most local councils, regional conditions may only affect the councils that belong to a certain region and local conditions are idiosyncratic to a particular local council. Ferreira & Marques (2014) classifies the exogenous factors into five broad categories:

1. natural (climate, geology, biodiversity) which are regarded as resources or constraints;

2. customer-related (socio-cultural, demographic, consumption levels) that portrays the behaviour, characteristics and capacity of stakeholders;

3. institutional (legal, regulatory, political and economic issues) that encompasses the capacity and behaviour of institutions that interact with the local authorities;

4. legacy conditions (location, boundaries and historical events such as past investments and debts) which are inherited aspects of local authorities; and

5. market conditions (inflation, interest rates number of suppliers and competitors).

Ferreira and Marques (2014) found a strong association between local government performance and several non-controllable factors in Portugal and these exogenous factors may at times have greater affect than controllable factors. Ferreira & Marques (2014) point out that some local authorities may be impacted by these factors and therefore regarded as poor performers, while other local authorities benefit from optimal conditions and may score without merit. For example, some local councils are disadvantaged by natural disasters or low economic activities due to remoteness, lack of natural resources, and the burden of an increasing aged

population. The effects of the external factors are non-controllable by local governments in the short term, but the central government can mitigate the long term effects of the factors. In particular, the central government should consider these external factors when making decisions on financial assistance to local authorities and when making national budget decisions involving local districts.

This paper makes important contributions to management accounting literature in three major aspects. First, the model developed in current study is a comprehensive measurement tool consisting of benchmarks, a systematic method for scoring and grading and financial trend analysing technique. By contrast, many prior studies only focused on financial ratio analysis (see, for example, PWC, 2006; Access Economics, 2007; Fiscal Star, 2009; FSRB, 2005; Wang et al., 2007; Carmeli, 2002). The financial trend analysis technique incorporated in this study solves a major deficiency in Brown (1993)'s Ten-Point Test which lacks a multi-year comparability. Second, the current study has responded to the lack of a taxonomy of ratios in extant studies. The taxonomy of financial and demographic ratios incorporated in our model is able to provide a more holistic assessment of the financial sustainability of local authorities. The model comprises of sets of ratios which define financial sustainability of local government according to several dimensions. The model evaluates each dimension of financial sustainability separately and also provides an overall depiction (in terms of a total score and grading) of the financial sustainability status of a local authority. Third, while there are voluminous literature on financial sustainability measurement models of local government in other jurisdictions that have attempted to align their accountability with the NPM or new public management philosophy (Bevir et al., 2003; Cavalluzzo & Ittner, 2004; Herawaty & Hoque, 2007), there is little model development to measure financial sustainability of New Zealand local authorities. To fill this gap, the current study is the first to suggest a financial sustainability evaluating model that could be applied consistently on a nationwide scale in New Zealand. The model can also be applied to other jurisdictions as it is designed on a set of measures which are universally accepted in the accounting discipline as applicable to both the private and public sectors. Most of the ratios used in the model are common to local authorities around the globe. The generic nature of the model is a result of it not considering the natural, customer, institutional and legacy factors in the financial

sustainability analysis, although this could mean one should be cautious in comparing countries that differ in terms of these factors.

Beyond satisfying the enthusiasm of academics, the financial sustainability evaluating model has practical relevance for local authorities and their stakeholders. This is particularly important in the current millennium where local governments are becoming increasing aware of the importance of a good performance measurement system (Brusca & Montesinos, 2013). Whether local authorities are trying to present a proposal to raise funds, charge fees for service or cut services, it is important for council officials to consider financial sustainability of their local authorities. Local council officials could use the model to understand and assess problem areas in their councils and take "management by exception" actions to improve financial sustainability performance into the future. Management reporting would help in identifying areas that have contributed unfavourably and that appear to threaten future financial sustainability. The model is particularly useful during economic crises when local authorities tend to impose strict constraints on expenditure and services.

Brusca and Montesinos (2013) consider performance measurement systems as innovations that facilitate rational decision-making, accountability and transparency in the use of public resources. In particular, performance reporting is an important means of discharging accountability in the public sector (Tooley et al., 2010). A paradigm shift toward more accountability (Chang, 2007) and greater pressure to show progress or recuperation from unfavourable financial trends (Wisniewski & Olafsson, 2004; McAdam et. al., 2005) are challenges encountered by public sector organisations. Local authorities are increasingly curious about the aspects of accountability that entails performance measurement and reporting (Barry, 2000; Berman & Wang, 2000). Included in the accountability are management processes that facilitate the understanding of performance, setting expectations, improving performance and meeting public expectations (Behn, 2003). Using the model developed in the current study, local government officials can measure and communicate their councils' financial sustainability to local communities on an ongoing basis. Such form of accountability is a means for local authorities to be answerable to the general public and helps local communities to evaluate whether their local councils are performing as expected. Understanding the financial sustainability of their local

councils can help individuals make decisions regarding home or business location or relocation. It is important to note that the accountability could also have implications for local government elections. A thrifty financial policy resulting in low debts and parsimonious spending could achieve strong financial sustainability. Such a policy may not get the support of local citizens especially when strong financial sustainability is attained by compromising essential services and as such local councillors who focus on economic performance may be punished in local elections. In contrast, the quality of services could have been elevated through extravagance and high debt levels and such service performance may be viewed positively by local voters. Hence, strong financial sustainability may not be always rewarded by the voter. Rigorous reporting and public awareness programs on the importance of financial sustainability could help elevate local citizens' understandings.

CONCLUSION

The financial sustainability evaluating model developed in this study is a systematic and consistent tool that allows for a nationwide assessment of local government performance. The financial sustainability analysis is the starting point for studying the efficiency, effectiveness and performance of local authorities, in particular for examining resources utilization by the local authorities. However, it is important to note that any evaluation model to be applied to local government of a given country must take into account variables that are idiosyncratic to that country in order to make the evaluation more meaningful. Several avenues are suggested for future research. To provide robustness in the evaluation of local government performance, future studies could consider the perceptions and preferences of local authority officials and local citizens while designing an evaluation model. Future research could draw from the insights of local council officials, local communities and other stakeholders regarding the determinants of financial sustainability and in particular the factors that are idiosyncratic to the councils such as location, population, political, environmental and cultural factors. This could be done by interviewing local council officials and local rate payers and also through a survey. Another orientation for future research is to create a system of benchmarking, scoring, grading and trend analysis that could measure the efficiency and effectiveness of local

authorities by including the services provided by local authorities in the model. For instance the ratio of water supply to expenditure on water supply; tons of domestic rubbish disposed to expenditure on rubbish disposal, local population to local council houses, local population to schools, etc. A greater challenge for future research would be to develop a model that could evaluate the overall sustainability (economic, environment and social) and not merely the financial sustainability of local authorities.

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APPENDIX A

Benchmarks (Average for 2001 – 2010) and Assigned Scores

Ratio	Quartile	Group 1	Group 2	Group 3	Group 4	Score
01 Profit margin ratio	1	17.3% or more	18.9% or more	23.2% or more	14.4% or more	0
	2	10.6% to <17.3%	14.0% to <18.9%	13.8% to < 23.2%	8.3% to < 14.4%	1
	3	8.0% to <10.6%	8.6% to <14.0%	7.5% to < 13.8%	5.9% to < 8.3%	2
	4	< 8.0%	< 8.6%	< 7.5%	< 5.9%	-1
02 Current ratio	1	2.9 or more	3.8 or more	2.3 or more	3.4 or more	2
	2	1.2 to < 2.9	1.2 to < 3.8	1.5 to < 2.3	2.0 to < 3.4	1
	3	0.5 to < 1.2	0.9 to < 1.2	1.2 to < 1.5	1.4 to < 2.0	0
	4	< 0.5	< 0.9	< 1.2	< 1.4	-1
03 Operating cash flow to total revenue ratio	1	21.8% or more	12.2% or more	18.6% or more	29.3% or more	2
	2	8.5% to < 21.8%	5.9% to < 12.2%	15.5% to < 18.6%	20.6% to < 29.3%	1
	3	5.2% to < 8.5%	4.4% to < 5.9%	7.0% to < 15.5%	7.8% to < 20.6%	0
	4	< 5.2%	< 4.4%	< 7.0%	< 7.8%	-1
04 Interest coverage ratio	1	36.4 or more	11.1 or more	27.1 or more	23.1 or more	2
	2	6.0 to < 36.4	8.4 to < 11.1	5.3 to < 27.1	5.2 to < 23.1	1
	3	2.3 to < 6.0	3.0 to < 8.4	2.9 to < 5.3	2.3 to < 5.2	0
	4	< 2.3	< 3.0	< 2.9	< 2.3	-1
05 Debt to total asset ratio	1	9.9% or more	8.9 % or more	6.5% or more	5.7% or more	-1
	2	5.4% to < 9.9%	5.7% to < 8.9%	4.3% to < 6.5%	3.3% to < 5.7%	0
	3	4.2% to < 5.4%	4.3% to < 5.7%	3.2% to < 4.3%	2.0% to < 3.3%	1
	4	< 4.2%	< 4.3%	< 3.2%	< 2.0%	2
06 Net debt to total revenue	1	106.9% or more	101.7% or more	84.3% or more	76.9% or more	-1
	2	69% to < 106.9%	86% to < 101.7%	44.8% to < 84.3%	33.9% to < 76.9%	0
	3	3.1% to < 69.9%	54.5% to < 86.3%	24.1% to < 44.8%	9.8% to < 33.9%	1
	4	< 3.1%	< 54.5%	< 24.1%	< 9.8%	2

Ratio	Quartile	Group 1	Group 2	Group 3	Group 4	Score
07 Rates coverage ratio	1	61.5% or more	67.7% or more	64.9% or more	61.5% or more	2
	2	54.0% to < 61.5%	65.3% to < 67.7%	59.5% to < 64.9%	58.2% to < 61.5%	1
	3	41.8% to 54.0%	53.6% to < 65.3%	54.4% to < 59.5%	48.1% to < 58.2%	0
	4	< 41.8%	< 53.6%	< 54.4%	< 48.1%	-1
08 Rates revenue to total revenue ratio	1	55.2% or more	56.3% or more	54.7% or more	57.7% or more	2
	2	47.1% to < 55.2%	52.1% to < 56.3%	50.9% to < 54.7%	50.1% to < 57.7%	1
	3	39.9% to < 47.1%	50.0% to < 52.1%	46.4% to < 50.9%	43.2% to < 50.1%	0
	4	< 39.9%	< 50.0%	< 46.4%	< 43.2%	-1
09 Asset turnover	1	21.0% or more	10.7% or more	9.4% or more	9.2% or more	2
	2	10.1% to < 21.0%	8.2% to < 10.7%	7.7% to < 9.4%	7.2% to < 9.2%	1
	3	8.4% to < 10.1%	7.6% to < 8.2%	7.3% to < 7.7%	6.4% to < 7.2%	0
	4	< 8.4%	< 7.6%	< 7.3%	< 6.4%	-1
10 Net interest expense ratio	1	3.6% or more	3.1% or more	2.4% or more	2.9% or more	-1
	2	-1.0% to < 3.6%	2.6% to < 3.1%	-0.4% to < 2.4%	-0.4% to < 2.9%	0
	3	-3.8% to < -1.0%	0.2% to < 2.6%	-2.9 to < -0.4	-2.2% to < -0.4%	1
	4	< -3.8%	< 0.2%	< -2.9%	< -2.2%	2
11 Population growth	1	1.7% or more	0.9% or more	1.3% or more	0.6% or more	2
	2	1.1% to < 1.7%	0.6% to < 0.9%	0.6% to < 1.3%	0.4% to < 0.6%	1
	3	0.8% to < 1.1%	0.3% to < 0.6%	0.2% to < 0.6%	-0.3% to < 0.4%	0
	4	< 0.8% o	< 0.3% o	< 0.2%	< -0.3%	-1
12 Population density	1	549.2 or more	236.3 or more	20.9 or more	4.5 or more	2
	2	58.4 to < 549.2	28.9 to < 236.3	10.1 to < 20.9	3.3 to < 4.5	1
	3	14.8 to < 58.4	14.2 to < 28.9	4.8 to < 10.1	2.0 to < 3.3	0
	4	< 14.8	< 14.2	< 4.8	> 2.0	-1
13 Population to Dwelling ratio	1	2.7 or more	2.7 or more	2.6 or more	2.3 or more	2
	2	2.5 to < 2.7	2.5 to < 2.7	2.4 to < 2.6	2.2 to < 2.3	1
	3	2.4 to < 2.5	2.4 to < 2.5	2.1 to < 2.4	2.1 to < 2.2	0
	4	< 2.4	< 2.4	< 2.1	< 2.1	-1

APPENDIX B

Financial Sustainability Worksheet

A	B	C	D				E
Dimension	**Indicator**	**Council Ratio**	**Quartile**				**Council's Score**
			1	**2**	**3**	**4**	
Financial Management	01 Profit margin ratio		0	1	2	-1	
Liquidity	02 Current ratio		2	1	0	-1	
	03 Operating cash flow to total revenue ratio		2	1	0	-1	
	04 Interest coverage ratio		2	1	0	-1	
Financial Structure	05 Debt to total asset ratio		-1	0	1	2	
	06 Net debt to total revenue		-1	0	1	2	
Performance	07 Rates coverage ratio		2	1	0	-1	
	08 Rates revenue to total revenue ratio		2	1	0	-1	
	09 Asset turnover		2	1	0	-1	
	10 Net interest expense ratio		-1	0	1	2	
Demographic	11 Population growth		2	1	0	-1	
	12 Population density		2	1	0	-1	
	13 Population to Dwelling ratio		2	1	0	-1	
Council's overall financial sustainability score							

APPENDIX C

Features of Financial Sustainability Evaluating Model

1. Performance Ratios				
Financial Sustainability				
Financial Management	**Liquidity**	**Financial Structure**	**Performance**	**Demographic**
• Profit Margin Ratio	• Current Ratio • Operating Cash Flow to Total Revenue Ratio • Interest Coverage Ratio	• Debt to Total Asset Ratio • Net Debt to Total Revenue	• Rates Coverage Ratio • Rates Revenue to Total Revenue Ratio • Asset Turnover • Net Interest Expense Ratio	• Population Growth • Population Density • Population to Dwelling Ratio

2. Quartile Scores		
Group	**Quartile**	**Assigned Score**
Group 1	Quartile 1	2
Group 2	Quartile 2	1
Group 3	Quartile 3	0
Group 4	Quartile 4	-1

3. Grading of Ratio Scores	
Score	**Rating**
2	Favourable (F)
1	Caution (C)
0	Warning (W)
-1	Unfavourable (U)

4. Overall Sustainability Scores and Grading	
Overall Score	**Rating**
Less than - 4	Financially Unsustainable (US)
-4 to < 1	Financially Vulnerable (V)
1 to < 5	Minimally Sustainable (MIS)
5 to < 10	Moderately Sustainable (MDS)
10 or more	Strongly Sustainable (SS)

APPENDIX D

Trend Analysis for Waikato Regional Council: Scores and Grading

Ratio	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
01 Profit margin ratio	-1	-1	-1	-1	-1	-1	-1	-1	-1	0
02 Current ratio	0	0	0	0	0	1	1	1	1	1
03 Operating cash flow to total revenue ratio	1	0	-1	-1	-1	1	1	1	1	1
04 Interest coverage ratio	-1	-1	-1	0	2	-1	2	2	-1	1
05 Debt to total asset ratio	0	0	0	1	0	0	0	2	2	2
06 Net debt to total revenue	1	1	1	1	1	2	1	1	1	2
07 Rates coverage ratio	0	0	1	1	1	2	2	2	2	2
08 Rates revenue to total revenue ratio	2	1	2	2	2	2	2	2	2	2
09 Asset turnover	1	1	1	2	2	2	2	1	1	2
10 Net interest expense ratio	2	2	1	1	1	0	1	1	1	0
11 Population growth	-	-	-	-	-	1	0	0	0	1
12 Population density	-	-	-	-	-	0	0	0	0	0
13 Population to Dwelling ratio	-	-	-	-	-	-1	-1	-1	-1	-1
Total Score	5	3	3	6	7	8	10	11	8	13
Sustainability Grading	MDS	MIS	MIS	MDS	MDS	MDS	SS	SS	MDS	SS

APPENDIX E

Trend Analysis for Dunedin City: Scores and Gradings

Ratio	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
01 Profit margin ratio	-1	-1	-1	-1	1	2	-1	-1	1	0
02 Current ratio	1	1	1	1	1	1	1	0	0	0
03 Operating cash flow to total revenue ratio	1	-1	-1	-1	-1	-1	-1	-1	-1	-1
04 Interest coverage ratio	0	0	-1	1	1	-1	-1	0	-1	0
05 Debt to total asset ratio	2	2	2	2	1	1	1	0	0	-1
06 Net debt to total revenue	1	1	1	1	1	1	0	-1	-1	-1
07 Rates coverage ratio	1	1	0	0	0	0	0	0	0	0
08 Rates revenue to total revenue ratio	1	1	1	1	0	0	0	0	0	-1
09 Asset turnover	-1	-1	-1	-1	-1	-1	-1	-1	-1	1
10 Net interest expense ratio	2	2	2	2	1	1	1	1	1	0
11 Population growth	-	-	-	-	-	-1	-1	-1	-1	0
12 Population density	-	-	-	-	-	0	0	0	0	0
13 Population to Dwelling ratio	-	-	-	-	-	1	1	1	1	1
Total Score	**7**	**5**	**3**	**5**	**4**	**3**	**-1**	**-3**	**-2**	**-2**
Sustainability Grading	**MDS**	**MDS**	**MIS**	**MDS**	**MIS**	**MIS**	**V**	**V**	**V**	**V**