MEASURING AND EVALUATING THE FINANCIAL CONDITION OF LOCAL GOVERNMENT

A Thesis

Presented to the faculty of the Department of Public Policy and Administration

California State University, Sacramento

Submitted in partial satisfaction of
the requirements for the degree of

MASTER OF PUBLIC POLICY AND ADMINISTRATION

by

Tina Kim Ramsey

SPRING
2013

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Abstract

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MEASURING AND EVALUATING THE FINANCIAL CONDITION OF LOCAL GOVERNMENT

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Tina Kim Ramsey

Turnkey solutions to measuring and evaluating the financial condition of local government do not exist. The contextual diversity between local jurisdictions precludes a one-size-fits-all approach; however, there are more similarities than differences. While many impediments, (lack of normative standards, lack of empirical evidence, and perceived ambiguities regarding the efficacy of various approaches, shifting intergovernmental relationships, and lack of control over revenue generating capacity) present, techniques, tools, and methodologies do exist. The key lies in developing jurisdiction-specific analytical models to routinely monitor, assess, and identify potential issues early enough to avoid and mitigate fiscal vulnerabilities. Developing such a framework requires intimate contextual and domain knowledge, as well as awareness of the multi-causal relationships that exist between a jurisdiction's external environment, its internal finances, and its management practices.

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Chapter 1

INTRODUCTION

Unprecedented budgetary crises at all levels of government, incited by the Great Recession of 2008, reshaped the public finance landscape. Increasing proportions of annual budgets were being usurped by the escalating costs of legislated commitments, agreed to in prior budget years—add to that the worst economy since the Great Depression. Tax bases were diminishing rapidly, revenues were declining, and service demands were increasing. Deficits became the norm. The dire consequences of local governments' that traditionally focused on paying the current month's bills and balancing the annual budget, with limited or no financial planning beyond the current fiscal year became unavoidable. In the short term, jurisdictions primarily responded to these shortfalls by decreasing staff, providing fewer services, increasing efficiency, and in rare cases, increasing fees and tax structures. As local governments' financial positions grew increasingly precarious given the dynamics of the economy, the political climate, intergovernmental relationships, and shifting demographics, it became imperative that government respond more purposefully instead of reactively. Local governments increasingly realized the necessity to take a broader view of their financial condition, beyond the current budget year, in order to achieve financial solvency over time.

In this project-based thesis for Yolo, County, California, I will explore the inherent challenges of measuring and evaluating local government financial condition. I will discuss how the purpose and operational practice of financial condition analysis has evolved since its inception and discuss the most prominent approaches currently available

in the academic and practitioner literature. I will analyze these approaches and derive the recurrent limitations and strengths of these models. Based on my findings, I will develop guidelines to assist Yolo County, California, with determining how to build a financial condition analysis model tailored to its specific fiscal objectives.

Overview

Measuring and evaluating the financial condition of local government requires as much artistry as it does science. Essentially, no framework can be used effectively without experiential judgment and contextual knowledge of a jurisdiction. Assessing financial condition cannot be determined in a vacuum. Solely relying on a unit's internal financial data is inadequate. Economic, political, legislative, and factors, combined with each jurisdiction's specific response to these external forces, determines overall financial health. Measures of financial condition are typically multi-causal. As such, the analysis of financial indicators must be evaluated simultaneously, not one at a time. The diversity and complexity of local government preclude developing tools and benchmarks that are universally applicable to all jurisdictions. Often a metric that may be relevant and critical to one jurisdiction is inconsequential to another. Similarly, a metric's quantitative value often can be ambiguous: a quantitative value favorable to one jurisdiction's health may be problematic for another. Hybrid approaches that emphasize the necessity of both quantitative and qualitative measures for comprehensive assessment have superseded nascent practices that optimistically sought to develop one-size-fits-all measurement and evaluation methodologies that were restricted to relying solely on internal financial data.

Simply put, the numbers do not tell the whole story. It is crucial that each jurisdiction develop an analytical framework tailored to its specific environment.

Project Background

The original intent of this project-based thesis was to produce a Fiscal Environment Analysis (FEA) report for Yolo County, California, based on the model developed by the Government Finance Officers' Association (GFOA). Simply put, a FEA examines a government jurisdiction's external and internal environment to identify "fiscal strengths and weaknesses, which define both opportunities for improvement and constraints on future activities" (Kavanagh, 2007). The FEA report was intended to be included in the County's 2012-2013 Long Term Financial Plan that was adopted by the Yolo County Board of Supervisors as a primary component for achieving the County's long term strategic goal of financial sustainability within five years. Yolo County defined "sustainability" as its ability to provide valuable services, operate within its available means, implement pro-active finance related measures based on expanded evaluative monitoring and projections, build and maintain existing service levels, and to develop and implement long run financial planning processes throughout the enterprise (County of Yolo, n.d.). After studying the body of literature regarding measuring and evaluating the financial condition of local government it became apparent that generating an actual FEA for Yolo County was far beyond the scope of this project thesis. As such, the project objective was modified to develop a methodology that the County could use to develop a customized, adaptable, and resilient FEA analytical model for inclusion in its Long Term Financial Plan.

The Yolo County Board of Director's 2010 mandate to develop a Long Term Strategic Plan was prompted by the extraordinary budgetary shortfalls incurred in 2009 and 2010. Several additional factors intensified the recognition that long term financial planning, although not traditionally a primary function of county-level public finance in California, would become a necessity to the Yolo County's self-preservation. These included a degradation in the County's bond rating, increasing trends towards shifting intergovernmental service delivery and funding from the State of California back to Yolo County, spiraling pension and other post-employment benefits (OPEB), and a political climate increasingly antagonistic regarding the addition of any new fees or taxes. As such, Yolo's Board of Supervisors, the County Administrative Officer (CAO), and the Auditor-Controller/ Treasurer Tax Collector determined that long term financial planning was vital to maintaining the County's financial solvency (P. Blacklock, personal communications, October, 17, 2011).

In practice, Yolo County plans on incorporating an FEA within its Long Term Financial Plan to increase its visibility to the myriad factors that could adversely affect its near, intermediate, and long term financial position (H. Newens, personal communication, August 31, 2011). Properly specified, a FEA provides an analytical framework to support, with increased precision and timeliness, the monitoring and evaluation of overall financial condition. It increases a jurisdiction's insight into potentially emerging financial issues prior to them reaching crisis proportion, as well as its ability to plan and act effectively. The FEA also facilitates the inclusion of long term costs in the annual budget process dialogue and expands a jurisdiction's understanding of

the factors that affect its financial condition, enabling the generation of more accurate long-term revenue and expenditure projections for use in the planning process. The FEA is a living document that requires ongoing management commitment to keep it synchronized with the dynamics of both the internal and external environment that influence the analysis it yields. Lastly, a FEA report simplifies and augments a local government's ability to inform management, internal staff, and the public on financial condition and any associative ameliorative directives (Kavanagh, 2007).

Project Approach

In order to determine how to develop guidelines for Yolo County to produce a customized FEA, best suited to their long term financial sustainability goals, I reviewed the body of literature related to measuring and evaluating financial condition. This included an extensive body of practitioner literature in addition to the academic research. I identified recurring themes throughout the literature and integrated the work of various authors by theme. In addition to synthesizing the commonalities encountered across the literature, I developed themes that were not articulated to facilitate qualitatively assessing the existing approaches from both a technical and efficiency perspective. I also reviewed actual FEA reports from various local governments throughout the U.S. and met with Yolo County Management to gather high-level domain and contextual information. Relying on my evaluation of what was already known, combined with my respective experiential knowledge, I developed FEA Development Guidelines for Yolo County, California that are universally applicable to all local jurisdictions.

Chapter 2

IMPEDIMENTS TO FINANCIAL CONDITION ANALYSIS

The inherent nature of measuring and evaluating the financial condition of local government is rife with impediments. First, since "financial condition" is a conceptual construct it cannot be discretely defined and measured absolutely. Even the best measurements are subjective because they are highly context sensitive. Second, the public and private sector also face very different objectives, social versus economic, resulting in disparate reporting requirements and data availability. By virtue of the environments they operate in, assessing governmental financial condition in the public sector is very different from that of the private sector. Third, local governments are mandated to use a fund accounting approach that has shaped the way that financial condition has been historically measured. Fourth, the research literature lacks empirical findings. It contains a lot more "doings" and "suggestions" than it does evidence. Fifth, the cost of staffing resources with the appropriate skill set necessary to carry out fiscal condition analysis may be cost prohibitive. Sixth, shifting an organizational culture entrenched in short term fiscal analysis to one that extends into future periods represents a considerable paradigm shift. Lastly, local governments, particularly California's Counties, lack full control of their revenues and expenditures.

Defining Financial Condition is Not an Exact Science

What Measure Defines Financial Condition?

The primary impediment to measuring and evaluating financial condition is that it cannot be discretely defined. Even the best measurements are subjective because they are

highly context dependent. Considerable effort has been expended to define the conceptual construct, "the financial condition of local government." The variety of discourse adds more confusion than clarification. Several terms that measure the same concept have been used: *fiscal health, fiscal stress, fiscal strain, fiscal distress, fiscal position and fiscal stability*. Similarly, the word fiscal is often interchanged with financial. While each study provides a unique operational definition for these terms, they are simply gradations of one umbrella concept: financial condition. Essentially, all of the definitions seek to measure the ability that a local government maintains to do one or more of the following: pay current bills, balance the annual budget, satisfy long-term financial obligations, and meet current and future service level requirements. The literature refers to these aspects of financial condition, relatively consistently, as cash solvency, budgetary solvency, long-term solvency, and service level solvency, respectively (Honadle, Costa, & Sigler, 2004; Maher & Nollenberger, 2009; Nollenberger, Groves, & Valente, 2003; Wang, 2007). Since these four aspects of the conceptual construct, "the financial condition of local government," are subjective, they cannot be measured in absolute terms. As such, they are gauged by using proxy indicators, primarily ratios that are consistent with public finance theory and practice. Table 3.1 lists several proxy indicators that are common throughout the literature. This table is not an exhaustive list of all the indicators used in each model; it is a sampling to illustrate the commonalities and differences between models.

Table 2.1: Sample of Common Financial Condition Proxy Indicators

Ratio	Brown (1993)	Nollenberger, Groves, & Valente (2003)	Kloha, Weissert, & Kleine (2005)	Kavanagh (2007)	Wang & Tu (2007)	Sohl, Peddle, Thurmaier, Wood, & Kuhn (2009)	Maher & Nollenberger (2009)
Total Revenues / Population	X	X[ab]		X[b]	X	X	X[a]
Total General Fund Cash & Investments / Total General Fund Liabilities	X	X			X		X
Total General Fund Liabilities / Total General Fund Revenues	X	X[a]			X		X
Total Revenues / Total Expenditures	X				X		X
General Fund Sources from Other Funds / Total General Fund Sources	X	X		X[b]			X
Unreserved General Fund Balance / Total General Fund Revenues	X					X	X
Direct Long-Term Debt / Population	X				X		

Table 2.1 (continued)

Post Employment Benefit Assets Liabilities		X		X			
Operating Surplus/Deficit Net Operating Revenue				X		X	X
Total Expenditures Population		X		X	X		

a: These authors suggest using "net operating revenues" in lieu of "total revenues."
b: These authors suggest adjusting for inflation to convert current dollars into constant dollars.
c: These authors developed custom indicators that are not used in other models.

What Time Period Defines Financial Condition?

The nature of public finance typically restricts the use of proxy indicators available for assessing local government financial condition. This is not a gross oversight made by government. The shorter term focus of government exemplifies that the originating intentions established for the public finance community, dating back to the 1900's, do not mirror those of a private enterprise (Petersen, 1977). Since the public finance community was primarily tasked with demonstrating accountability, transparency, a balanced budget, and compliance with the law (Groves et al., 2003), fund accounting was the accounting mechanism of choice for achieving these year-to-year requirements (Ruppel, 2010). Conversely, private sector finance used cost accounting to optimize the realization of its principle objective, maximizing profit, and long term solvency. Accomplishing these different objectives simply necessitated the use of different accounting and reporting procedures.

As such, definitions of local government financial condition typically had a narrow accounting focus based on the current budget year, whereas private enterprises and investors measurements extended beyond the current budget year (Maher & Nollenberger, 2009). Table 2.2, defines the continuum of solvency focuses and illustrates the traditional discrepancy between public and private sector assessments of financial condition.

Table 2.2: Solvency Focus between the Public and Private Sector

Solvency Type[a]	Definition[a]	Traditional Solvency Focus	
		Public Sector: Fund Accounting[b]	Private Sector: Cost Accounting[c]
Cash	Capacity to generate enough cash or liquidity to pay its bills over the next 30 to 60 days.	X	X
Budgetary	Capacity to generate adequate revenues over fiscal year budgetary period to satisfy expenditures without incurring a deficit.	X	X
Long Term	Capacity to pay all costs incurred during the fiscal year, including expenditure obligations that appear only in the year(s) they must be paid (e.g., pension costs and OPEB, capital maintenance).		X
Service Level	Capacity to provide the quality and quantity of services to necessary to protect the general health and welfare, as requested by its citizens.		X

a: Nollenberger et al. (2003)

b: Ruppel (2010)

c: Harrison & Horngren (2005)

How Does Accounting Approach/Reporting Define Financial Condition?

While fund accounting may meet many legislated reporting requirements, its short-term focus impedes and can obscure the identification of ongoing and potentially emerging threats to a jurisdiction's financial health. It inadvertently incentivizes a jurisdiction to focus on short-term fiscal solutions such as its capacity to pay its bills month to month and to balance the current fiscal year's budget. It does not encourage

projecting future revenue and cost projections that are indispensable to effectively planning and securing a jurisdiction's long-term financial condition (Davidson, 2010). Additionally, the current operating budget and financial reporting requirements for local government do not expose management practices that can unintentionally impair long-term fiscal health. These include practices that maintain operating deficits, defer current costs, and ignore the full-life costs of long term liabilities (Institute for Local Government (ILG), 2010; Kavanagh, 2007; Nollenberger et al., 2003). Table 3.3, Potentially Harmful Fiscal Management Practices, reproduced from Nollenberger et al. (2003), elaborates on the practices that can impair a local jurisdiction's overall long-term financial condition when used repeatedly to mitigate short-term problems.

Table 2.3: Potentially Harmful Fiscal Management Practices[a]

Fiscal Management Practice	Sustained Operating Deficits	Deferred Current Cost	Unfunded Future Liabilities
Using reserves to balance the budget	X		
Using short term borrowing to balance the budget	X		
Using internal borrowing to balance the budget	X		
Selling assets to balance the budget	X		
Using one-time accounting changes to balance the budget	X		
Deferring pension liabilities		X	
Deferring maintenance expenditures		X	
Not costing out non-salary employee benefits			X
Ignoring full-life costs of capital assets			X

a: Nollenberger et al. (2003)

The Government Accounting Standards Board (GASB), a non-partisan federal agency established to develop state and local accounting standards, has sought to rectify shortcomings by mandating additional reporting requirements in 1999, known as

Statement No. 34, to be incrementally implemented up through 1984 that would provide visibility that was hitherto nonexistent. This pronouncement mandated substantial additions to public finance's legal reporting requirements, necessitating the inclusion of government-wide financial data, in addition to fund level data, and a management discussion and analysis (Chaney, Mead, & Schermann, 2002). Although GASB 34 increased visibility into the financial position of government, it was not complemented with policy obliging local governments to project or plan beyond balancing the current year's budget. As such, the conventional short term cash and budgetary definition of financial condition remained the primary focus of local finance until the Great Recession of 2008 substantiated the need to broaden the meaning of local government financial condition to encompass both long term and service level solvency. Regardless of accounting approach, Gauthier (2007) adds that defining fiscal health will always be more challenging for government. Since government's goal of delivering services is social and subjectively valued, measurements are relative at best. Alternatively, the private sector's goal is primary objective is economic, quantitatively valued, and facilitates the use of more effective objective decision rules.

Lacking Empirical Research

Research on the efficacy of the different models found in the literature is virtually nonexistent. Knowledge regarding the understanding of all of the causal factors that affect financial condition remains incomplete. The predictive strength of the most commonly used proxy measures has not been identified. The relationships between measures are not fully understood and often vary between jurisdictions. The consensus

among researchers and practitioners is that the literature lacks a principle theory for evaluating financial condition or a standardized set of measures sufficient to embody the concept in its entirety (Groves et al., 2003; Hendrick, 2004; Kavanagh, 2007; Sohl, Peddle, Thurmaier, Wood, & Kuhn, 2009; Wang, Dennis and Tu, 2007). Justice and Scorsone (2012) simply state that financial condition is a function of perspective. In effect, the subjective makeup of defining financial condition combined with the contextual diversity of each local jurisdiction preclude the development of any universally applicable, empirical method of evaluation (J. Justice, personal communication, September 9, 2011). Instead, the literature reflects what Horrigan (1968) refers to as "practical empiricism--" reliance upon the experiential knowledge of the author.

Honadle et al., in their book, *Fiscal Health for Local Governments*, remain the only researchers to even broach an actual comparative analysis between different authors' models. The study used the "10-Point Test of Financial Condition (Brown, 1993)," the "Fiscal Capacity Analysis (Alter, McLaughlinn, & Melniker, n.d.)," and the "Financial Trends Monitoring System (Groves & Godsey, 1980)" to assess the financial condition of a county in Minnesota. The authors provided a qualitative assessment of the merits and limitations of each approach. However, they did not provide any quantitative assessments on indicator or model effectiveness. While Coe (2008) did proffer an "emerging best practices" article on "preventing local government fiscal crises," it does not include any analysis to assess model effectiveness. Kloha et al. (2005) actually characterized the methods used by the states to identify fiscal stress as "entirely reactive

to fiscal stress" (p. 313). Coe (2008) just summarized the methods used by the 9 U.S. states that monitor local governments. To date, no empirical research exists in the literature regarding the efficacy of the myriad of surrogate metrics and approaches used to assess financial condition.

Financial Condition Analysis Requires Resources

A local jurisdiction's capacity to consistently measure and evaluate financial condition is often cost constrained. The breadth and effectiveness of a jurisdiction's approach requires dedicated personnel that possess the appropriate skill set to perform the analyses and maintain the analytical model. It also requires that the data and information of interest exist and are routinely collected, stored, and readily accessible in a format suited to the requirements of the selected analytical framework. Interestingly, while consulting with government agencies I have often discovered that individuals and departments frequently capture data for internal use without realizing its value elsewhere in the organization. Although the costs of locating it can be time intensive and involves asking the right questions, it usually offsets the cost of not having access to it. There are also cases of what Strock, Harris, and Bartz (2011) refer to as "knowledge hoarders" who withhold information in the belief that it buys them job security, at a cost to the organization. These findings are consistent with the financial condition literature that also states that obtaining and maintaining data of interest as a hindrance to measuring and evaluating financial condition (Hendrick, 2004; Kloha, Weissert, & Kleine, 2005; Nollenberger et al., 2005). In general, it appears that many local jurisdictions may not be sufficiently budgeted to monitor financial condition until financial crises manifest. For

example, the highly publicized bankruptcies of Orange County, California, Vallejo, California, and Stockton, California). The paradox is that it appears that greater resources are committed to financial condition during fiscal crises than during stable budgetary periods. Lack of vigilance increases the likelihood of overlooking potential fiscal threats that could have been averted. Routine and structured financial condition analysis can definitely contribute to a local jurisdiction's ongoing financial stability.

Organizational Culture

As previously mentioned, the traditional discipline of public finance has been to promote transparency, accountability, legal compliance, and balancing of the annual budget (Groves et al., 2003). It is telling that current educational literature in the discipline of fiscal administration and governmental accounting do not include information regarding all four aspects of a local governments' financial condition: cash, budgetary, long term, and service level solvency. Instead, the literature regarding expansive assessments of financial health (Berne & Schramm, 1986; Kavanaugh, 2007; Levine, Justice, & Scorsone, 2012; Nollenberger et al., 2003), stand alone, and have not been integrated within the traditional fiscal administration and accounting texts (Mikesell, 2007; Mikesell, 2011; Ruppel, 2010). These texts suggest that the public finance community has not formally adopted the evaluation of non-budget year financial condition as a conventional practice. Shifting the culture of a public organization that has been traditionally entrenched in paying the current bills and balancing the annual budget, to an organization that projects and plans for the long term budgetary requirements necessitates a significant shift in culture, as well as potentially requiring new skill sets.

Lack of Local Government Control Over Financial Condition

Lastly, local governments have limited control over considerable external forces that influence fiscal health (Honadle, 2004). Unforeseen circumstances beyond a local jurisdictions control can significantly affect a local government's ability to measure and evaluate financial condition: local and regional economics and shifting intergovernmental relationships. Local governments without home rule, the local autonomy and division between state and local revenue streams, face considerable legal constraints that diminish their revenue generating capacity (Hendrick, 2004) and flexibility to manage financial condition. In California, state legislation prevents most counties' ability to be financially independent by severely restricting local taxing authority, while legally requiring service delivery of numerous state-mandated services (Barbour, 2007; Sellers & Byers, 2010). Essentially, the reshaping of intergovernmental relationships that followed the passage of Proposition 13 in 1978 left California's counties largely fiscally dependent on the State (M. Coleman, personal communication, February 26, 2011). Acting as virtual subsidiaries of the State, the counties and are subjected to the State's fiscal instability (B. Williams, personal communication, February 5, 2011). Taken together, state-imposed restrictions on local taxing authority, fiscal dependency on the State, and unspecified legislation hamper local governments ability to evaluate its financial condition.

Chapter 3

SHIFTING OBJECTIVES AND APPROACHES TO FINANCIAL CONDITION ANALYSIS

In addition to the recurrent impediments intrinsic to measuring local government financial condition, the objectives likewise evolved. The progression is a result of four interacting dynamics: economics, policy objectives; managerial focus; and technology. Each component interacts and influences the outcome of the remaining three, not necessarily in that order. Primarily, a series of what Kingdon (2003) refers to as "focusing events," all that parallel severe economic downturns, have shaped the evolution of local government finance in the U.S. Policy-makers responded with legislation to mitigate future volatility. The public finance community revisited their approach to managing fiscal condition. Advances in technology facilitated the implementation of increasingly complex evaluation methodologies, providing visibility to fiscal activity that was henceforth unattainable. Each episode captured the interest of legislatures, academics, practitioners and the public alike, altering both the purpose, scope, and approach of local government fiscal condition analysis.

Regulatory Models -- Controls and Restrictions

The earliest semblance of the public sector financial condition analysis consisted of state-imposed restrictions on government borrowing and fiscal practices. Railroad bond defaults and the southern states' repudiation of Confederate debt in the early 1870s triggered these initial policy responses on state finance. Similarly, near the turn of the 19th century, states would end up imposing similar constraints on local governments, a

direct consequence of burgeoning debt burdens that could not be maintained during the economic downturn of 1893. Controls were again tightened to promote transparency and legal compliance following the scores of local government defaults that occurred during the Great Depression (Maxwell & Aronson, 1977; Petersen, 1977).

Theoretical Models

Urban flight in the 1950's and the associated fiscal distress of many municipalities, prompted a series of academic research aimed at developing theoretical models to describe fiscal distress. Rather than simply regulating and monitoring local governments' adherence to legislation, these researchers sought to identify the macro catalysts of declining fiscal condition. Tiebout (1956) led the procession with his seminal theory of population migration. He established that demand for public goods varies between jurisdictions and this manifests as non-uniform per capita revenues and expenditures between jurisdictions, according to the preferences of residents and businesses who locate themselves in the jurisdictions that match what they are willing to pay for the bundle of public goods that they seek. Stonecash, McAfee, Boor, Allen and Hamiltons' (1981) analysis elaborated on Tiebout's theory, stating that comparing the financial condition of local governments based on population size alone is not a sound benchmarking approach due to differentiations between the local government responses and uneven tax burdens. Groves, Godsey, and Shulman (1981) also concur that there is no universally accepted theory of the causal relationships between a locality's economic base and local government revenues. Additional theorists focused on macro catalysts:

eroding tax bases, over grown bureaucracy, interest group vulnerability, and internal fiscal management practices.

Preventative Models

Highly visible public sector financial crises of the early 1970s (as cited in Coe, 2008) motivated researchers to identify metrics that could be used to signal potential threats to financial health. The Advisory Commission on Intergovernmental Relations (ACIR), a permanent federal bi-partisan agency, set the stage for evaluating the financial condition of local governments by issuing a "list" of six warning signs indicative of declining financial condition. Unlike the earlier theoretical models, the ACIR's list of the six precipitating conditions of fiscal distress identified tangible operational circumstances that were highly correlated with the fiscal degeneration study of thirty municipalities already known to be troubled. These warning signs included the existence of outstanding short-term operating loans at the close of the budget year, borrowing monies from restricted funds to cover current liabilities, and the most prescient indicator of imminent fiscal crisis that largely catalyzed the Great Recession of 2008, a rapid and significant decline in assessed property values (ACIR, 1973).

Clark and Feguson (1976) and Petersen (1977) elaborated on the ACIR's six indicators of potential distress, emphasizing the holistic nature of fiscal health, advising that the determinants of financial condition were much more expansive than what was available in local governments' financial reports. Petersen (1977) suggested that local governments would benefit greatly by developing tools to identify potential fiscal crises, by emulating components of Moody' Investment Services and Standard & Poors' general

obligation bond analysis approach, in order to prevent fiscal calamities. These local bond credit rating agencies used methods to assess the financial condition of local government that remain much more similar to those used by the private sector. Since they represented the interests of private investors concerned with a local government's ability to meet its financial obligations beyond the current budget year, the credit rating agencies examined several items of interest that were not included in an agency's financial reports. For example, changes in financial reporting procedures and detail; revenue and debt composition; environmental drivers of revenue and expenditure conditions such as demographic makeup, key economic indicators, and legal circumstances; long term debt elements such as debt service, pension obligations, and debt limits; as well as, management performance as a function of past performance, risk preference, and tax policy.

These broadened views of fiscal health assessment, combined with public remonstration, and several states assuming oversight roles to monitor local governments' finances following New York City's 1975 default, signified an increasing awareness of the necessity to identify looming fiscal crises in a nascent state, before they gained enough momentum to debilitate fiscal condition (Petersen, 1977). It also signaled a departure in the literature, away from the regulatory and theoretical models towards practical operations-based approaches, setting the stage for the next phase of academic and practitioner literature on the topic.

Predictive Decision Models

Picking up where ACIR (1973), Clark and Ferguson (1976), and Petersen (1977) left off, academics and practitioners sought to develop quantifiable rule-based models that would improve financial condition analysis. As explained earlier, financial condition is a conceptual construct that cannot be discretely defined. As such, surrogate measures are used that have shown to be correlated with changes in financial solvency, to "measure" what cannot not be directly measured—financial condition. I have categorized the predictive decision models found in the literature under three primary theoretical frameworks: Closed System, Pseudo-Open System, and Open System. Table 4.1 summarizes the prominent literature available on measuring and evaluating local government financial condition.

Closed System approaches solely rely on internal financial data to assess financial health (Berne & Schram, 1986; Brown, 1993; Chaney, Mead, & Schermann, 2002; Maher & Nollenberger, 2009; Sohl et al., 2009; Wang et al., 2007). The Pseudo-Open System approach expands the Closed System view beyond internal accounting data. It maintains that environmental factors outside the organization and organizational factors within the organization also influence financial condition. Pseudo-Open system approaches acknowledge that the relationships between these factors are multi-directional, yet they derive financial condition without any mechanisms to account for the feedback effects (Groves, Godsey, & Shulman, 1981; Groves et al., 2003). The most prescriptive model that currently available is a Pseudo-Open System. The Open System approach conceives financial condition as an interactive living entity that is continuously

affecting and being affected by the external environment, the internal organization, and internal financial factors (Hendrick, 2004; Kavanagh, 2007; Krishnakumar, Martin, & Soguel, 2010). Each system orientation serves as a foundation for varying data and technical approaches. The myriad of combinations summarized in Table 4.1 attest to the complexity and challenges involved with financial condition analysis. "One right way" does not exist. I grouped the models this way to illustrate the relative cost-efficiency and predictive trade-offs between each systems view.

Table 3.1: Approaches to Financial Condition Analysis

System Approach	Data Approach[a]	Technical Approach									Author
		Indicator Analysis	Cross-Jurisdictional Comparisons		Composite Scores: Indexes Ranking	Trend Analysis	Bi-Variate Analysis	Linear Regression Analysis	Simul-taneous Equations	Fiscal Environ-ment Analysis	
			One-to-One	Avgs.							
Closed	ME										Tiebout (1956)
Closed	FS	X	X[b]								Berne & Schramm (1986)
Closed	FS GF	X		X[b]	X						Brown (1993)
Closed	FS GW	X		X			X				Wang, Dennis, & Tu (2007)
Closed	FS GW	X		X[b]							Maher & Nollenberger (2009)
Closed	FS GW	X		X	X						Sohl, Peddle, Thurmaier, Wood, & Kuhn(2009)

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			One-to-One	Avgs.							
Closed	FS GW										Chaney, Mead, & Schermann (2002)
Pseudo-Open	Multi	X	X								Campbell (1990)
Pseudo-Open	FS GF	X			X						Kloha, Weissert, & Kleine (2005)
Pseudo-Open	Multi	X				X					Groves & Godsey (1980)
Pseudo-Open	IO	X				X					Nollenberger, Groves, Valente (2003)
Open	ORG	X	X		X		X	X			Hendrick (2004)
Open	ORG SM	X				X	X	X		X	Kavanagh (2007)
Open	ME						X		X		Krishnakumar, Martin, & Soguel (2010)

a: FS= Financial System Theory; GF= General Fund data; GW= Government-Wide (GASB 34, 45) data; IO= Input-Output economics; ME= MacroEconomic Theory; Multi= Assortment of theoretical perspectives, yet not entirely allegiant to one; ORG= Organizational Theory; SM= Strategic Management Theory

Chapter 4

UNDERSTANDING TECHNICAL APPROACHES

As illustrated in Table 3.1, each model has employed different approaches to measure and evaluate local government financial condition. The predominance of the models for evaluating financial condition looked at local jurisdictions as closed financial systems. Both the Closed system and Pseudo-Open system models have a somewhat reactionary stance from the standpoint that they are designed to identify fiscal distress based on data that has been collected over time. Undesirable indicator measurements and trend trajectories based on historical data indicate that additional qualitative analysis is required to identify the culprits and to determine an appropriate course of action. Conversely, the Open System approaches model multi-causal relationships between a jurisdiction's external and internal environments so that potentially imminent threats to fiscal health may be predicted up front.

Closed Systems

This division of study attempted to develop decision support models that would assist with interpreting financial system data. Berne and Schramm (1986), in their seminal textbook, *The Financial Analysis of Governments*, introduced what led the next collection of research. Their most noteworthy contribution to the literature was their "time series analysis" of "common values." Their Closed System approach compared indexed values and percentages changes between time periods, within the jurisdiction, as well as to external "reference groups." Models incorporated mechanisms for evaluating a local government's financial indicators internally as well as in relation to similarly sized

jurisdictions. Multiple subsequent research efforts using cross-jurisdictional benchmarking comparisons (Brown, 1993; Campbell, 1990; Maher & Nollenberger, 2009; Sohl et al., 2009) reflect the work of the work of Berne & Schramm (1986). The primary difference between these models is how like jurisdictions were identified for comparison. The Pseudo-Open approaches drew from Tiebout (1956) and Stonecash et al. (1981) and incorporated several socioeconomic indicators and jurisdiction attributes to group like communities Campbell (1990) and Sohl et al. (2009); whereas, the Closed System approaches solely relied on population size to match jurisdictions for comparison Berne & Schramm (1986) Brown (1993), and Maher and Nollenberger (2009).

Cross-Jurisdictional Comparisons

Campbell (1990) expanded upon Berne and Schramm's "reference group" comparison approach. Instead of comparing one jurisdiction to another, he developed indicator averages for Illinois counties that could be used as relative benchmarks. Similarly, Brown (1993) used indicator averages of similarly sized jurisdictions in his Closed System approach. His model incorporated 10 ratio indicators, 9 from the 36 ratio indicators included in Grove et al.'s (1981) Financial Trend Monitoring System. Brown (1993) developed his indicator averages using the financial report data from 750 participating municipalities throughout the nation that was housed in the Government Finance Officers Association's (GFOA) 1989 Financial Indicators Data base. Each city was scored and ranked based on which quartile each of the 10 ratios scores fell.

Although Campbell (1990) had also developed a cross-jurisdictional model based on comparing averages, Brown's 10-Point Test was the simplest to use. Dissimilar to

Campbell (1990), the data required for the 10-Point Test was readily available in a local jurisdiction's financial reports. Brown's model was designed to enable smaller jurisdictions to routinely assess financial condition without investing excessive time in complex analytical techniques (Brown, 1993). Brown's introduction of the first quick and cost effective "10-Point Test" of financial condition was an influential contribution to the literature.

Drawing from Brown, Kloha et al. (2005) developed a Closed System model that identified 10 financial condition test indicators for Michigan local governments. It also used composite scores, graded and identified troubled local jurisdictions in Michigan. However, instead of using conventional financial ratio indicators, Kloha et al. (2005) developed 10 custom indicators. Conceptually, these indicators are representative of Hendrick's (2004) analysis of Chicago municipalities based on revenue wealth, spending needs, balance of fiscal structure with its environment, and fiscal slack (p. 85).

It is noteworthy that Kloha et al. (2005) were the first to introduce the "weighting" of financial indicators with current and prior period deficit balances—an approach that Ammar, Duncombe, Hou, Jump, and Wright (2001) identify as commonly used by credit rating firms to rate the financial performance of governments. Essentially, the Kloha et al. (2005) model gave more predictive influence to the indicators with higher "weights" than those with the lower weights. Similar to Brown (1993), each jurisdiction received a composite score and was ranked according to level of risk. Kloha et al. (2005) note that while their model exhibited "predictive" capabilities for Michigan local

government when compared to historical data, they acknowledged that its effectiveness cannot be assured with respect to other jurisdictions or over time.

Following Kloha et al. (2005), cross-jurisdictional comparisons remained dormant in the literature until they were reintroduced by Sohl et al. (2009) and Maher and Nollenberger (2009). The Closed System model developed by Maher & Nollenberger (2009) was directly built upon Brown's 10-Point Test. It mirrored Brown's 10-Point Test, less three indicators that were considered inessential, removed, and replaced with three new financial ratio indicators. For example, "total general fund liabilities as a percentage of total general fund liabilities" was removed. "Other postemployment benefit assets as a percentage of other post-benefit liabilities" was added. Additionally, the denominators of a few of the ratio indicators were modified. For example, the "long-term general obligation debt per capita" indicator was reformulated to be "long-term general obligation debt as a percentage of total assessed value" to more accurately measure revenue capacity. Essentially, the modified 10-point test included indicators capture long term solvency information that was not included in Brown's 10-Point Test.

Maher and Nollenberger (2009) also deviated from Brown (1993) by not generating composite scores for each city, stating that assessing each of the indicator values of similarly populated jurisdictions provided more beneficial information than one aggregated score that could mask visibility to unfavorable deviations in one of more indicators. However, they did follow Brown's approach of using the GFOA Financial Indicators Database to generate financial ratio indicator averages for cross-jurisdictional comparison. These authors averaged three years (2003-2006) of data instead of one the

one year of data used by Brown (1993). The city financial ratio indicator data was grouped by city size and broken into quartiles. It enabled cities with populations up to 100,000 to their indicators' values to those of similarly sized cities.

Bi-Variate Analysis

Unlike the more traditional fund-centric analysis approaches (Brown, 1993; Kloha et al., 2005), Chaney et al. (2002) and Wang et al. (2007) advocated developing indicators consistent with GASB Statement Number 34's accrual based, government-wide reporting because it provided a more accurate picture of overall financial condition, including long term solvency. That is, the impact of economic transactions are recorded when they are established instead of waiting until they are actually paid or received. Additionally, the government-wide reporting accounts for depreciated capital assets and the reporting of long-term obligations that expose the impact of long-term assets and debt on overall financial solvency (e.g., OPEB). Essentially, the risk of not using accrual based reporting for fiscal condition assessment is that an organization can appear considerably more solvent that it is when not accounting for its longer term obligations (Harrison & Horngren, 2005).

Using the government-wide data, Wang et al. (2007) employed 11 financial ratio indicators to measure all four types of financial solvency: cash, budgetary, long term and service level solvency. The ratio indicators selected resemble those common to the private sector (i.e., cash ratio, quick ratio, current ratio, operating, net asset ratio, etc.), yet the underlying ratios are not necessarily derived with the same data. In general, private sector financial analysis is echoed throughout the analysis. For example, the

authors used the private sector heuristic (quick ratio greater than 2.00 indicates cash and budgetary solvency) to interpret the state's quick ratio values. Using bi-variate analysis as a technical approach, also known as correlation analysis, Wang et al. (2007) found that there was a 99.9% level of confidence (Studenmund, 2011) that cash, budget, and long term solvency are positively correlated with each other. It makes sense that these indices would move together since the data in the numerators and denominators of the ratios used to build the four indices for each dimension are shared. Service-level solvency was not found to be correlated with the other three solvency types (cash, budgetary, long-term).

In addition to using government-wide data, the model is unique in that it is the first Closed system model to directly address evaluating the fourth element of overall financial health, service level solvency, using financial data (Wang et al., 2007). It is not surprising that the service-level solvency index was not correlated with the other three types. The index does not account for any of the socio-economic factors known to drive the demand and cost of delivering services. It is impossible for financial data alone to determine service-level solvency. The long-term costs of providing services cannot be established without knowing or projecting what service demand looks like. While Kavanagh (2007) also offers approaches for measuring service level solvency, they are not based on financial ratio analysis. They are based on assessing future demand as a function of shifts in demographics and monitoring existing performance measures to identify service requirements trajectories, non-fiscal data.

While Wang et al. (2007) reject the pseudo-open and open models' claims (Hendrick, 2004; Kavanagh, 2007) that socio-economic conditions can be used in the

measurement of financial condition, stating that it is "not financial condition itself" (p. 5), they claim that major socioeconomic variables can be used to predict financial condition. The authors derive a Financial Condition Index (FCI) for each state by "weighing and averaging the standardized scores" of the 11 selected financial ratio indicators. Then each states's FCI score is correlated against 8 socioeconomic indicators. Correlations existed with a 90% degree of confidence (Studenman, 2011, p. 585) for most of the socioeconomic indicators. Additionally, a 99.9% level of confidence that the economic momentum index (a state level index derived from the average of a one year change in employment, personal income, and population) is related with local government financial condition. This is consistent Benton and Bahl's assertions that the primary driver of state and local fiscal health is the national economy (as cited in Ammar et al., 2001; as cited in Honadle, 2004, p. 22). Once again, this is to be expected. Direct causal relationships exist between the variables that comprise the economic momentum index. This causal relationship is similar to that the claim that increased personal income increases tax revenues and spending, which increases sales tax revenues (McConnell, Brue, & Flynn, 2009).

Pseudo-Open Systems

A Pseudo-Open system exhibits characteristics of both Closed and Open systems. The original Financial Trends Monitoring System (FTMS) (Groves et al., 1980), published by the International City/County Managers Association (ICMA) is such a model. ICMA republished an updated and enhanced version the FTMS in 2003. Initially this model appears fully open because it is comprised of 42 indicators, 27

directly related to internal financial data while the remainder measure environmental and organizational factors. Yet, based on Kettl and Feslers' (2005) discussion on open systems theory, the FTMS is bounded and absent of features present in wholly open systems models. Contrasting the Financial Trend Modeling System approach against Hendrick's (2004) Open systems model elucidates the difference. Although Nollenberger et al. (2003) acknowledge that feedback relationships exist between the environment, the organization, and financial data, they intentionally do not address the bi-directional relationships. Presumably, because the complexity and costs of doing so could outweigh any additional insight gained. As such, the FTMS approach is designed as an input-output model framework: environmental factors are inputs to the organization that through puts them to generate outputs in the form of financial ratios (Wassily, 1986). The FTMS methodology consists of trending the values of up to 42 possible indicators over five years or more to identify unfavorable trends trajectories that warrant additional analysis because they could degrade financial health. The FTMS is additionally unique in that it also provides some quasi-quantitative guidance regarding the effectiveness of fiscal management practices— often considered one of the most decisive determinants of financial condition (Groves et al., 2003; Pammer, 1990).

Indicator Analysis

While ratio indicator analysis was hardly a new concept, the private sector had been performing financial ratio analysis for decades (Horrigan, 1968; Groves et al., 1981), the FTMS (Nollenberger et al., 2003) remains the indicator sourcebook of record for assessing local government fiscal health. Groves et al. (1980) had noted the

inadequacy of traditional budgetary, balance sheet, and operating statement analysis to reveal existing and emerging issues. As such, the identified quantitative indicators, absolute numbers and ratios, observed to affect the financial condition of local government. To date, the practitioner-based FTMS is the most extensive compilation of potential indicators of fiscal health available. It incorporates government-wide data made available through the GASB 34 reporting requirements. Additionally, based on the work of Ammar et al. (2001), it is also evident that many of the analytical components historically used by the credit rating agencies to rate local government bonds, are also included in the the Pseudo-open FTMS approach.

Trend Analysis

Nollenberger et al. (2003) demonstrated that evaluating indicator data over multiple years provides visibility to the materialization of neutral, favorable, and unfavorable trends affecting overall financial condition. Similar to the earlier multiple-period analysis trending approaches (Berne & Schramm, 1986; as cited in Honadle et al., 2004, p. 151), the FTMS indicators are trended over periods of five years or longer to identify emerging changes. However, Groves et al. (1980) greatly expanded on the previous works. The FTMS provided an operationally prescriptive approach for evaluating the meaning of indicator values over time. The FTMS included warning signs for each indicator that alert the user that additional qualitative analysis is required to determine if a trend appearing unfavorable on the surface constitutes a potential threat to financial condition.

In some cases, determining if a warning sign is problematic is relatively self-evident. For example, an increasing trend in uncollected property taxes is intuitively detrimental, especially if service level demand has not changed. However, assessing many warning signs can be much more involved, requiring considerable contextual and domain knowledge Overall, the FTMS handbook, *Evaluating Financial Condition*, is quite instructive. While it does not include wholly prescriptive decision-rules, it provides detailed discourse on each indicator, commentary offering potential explanations of trend trajectories, and directions for additional analysis if the FTMS commentary was not sufficient to explain undesirable trending patterns (Nollenberger et al., 2003). Users of Closed cystem approaches can benefit from the interpretive guidelines as well, since the FTMS contains most of the indicators found in the abbreviated models (Brown, 1993; Chaney, 2002; Wang, 2007; Maher & Nollenberger, 2009).

Open Systems

Senge (2006) states, "systems thinking is a discipline for seeing wholes." It is a framework for seeing interrelationships rather than things, for seeing patterns of change rather than static snapshots (p. 68). Researchers seeking to pinpoint and quantify the influence and interdependencies between internal and external proxy indicators pursued Open system approaches. Unlike the Closed system models, relegated to internal financial data, the Open system models' incorporate variables that extend beyond a local government's control. Additionally, unlike the Pseudo-Open models, the Open models also accommodate for the degrees of feedback between the factors observed to affect financial condition. The open systems theory asserts that local governments are

continuously interacting with their environment and that movement in the external environment influences the responses of the internal governmental unit and these consequent responses influence the external environment (Bolman & Deals, 2008; Bryson, 2004; Krishnakumar et al., 2010). Accordingly, a local government's fiscal condition is simultaneously influenced by numerous interacting factors, internal and external to the organization: revenues and expenditures; fiscal management practices; economics; local and regional politics; legislation; demographics, as well as disasters (Hendrick 2004; Kavanagh, 2007).

Hendrick (2004) has developed the most comprehensive theoretical Open system view of the underpinnings of local government financial condition. Her model asserts that the two primary dimensions of fiscal health are "properties of the environment" (external) and "properties of government" (internal) which interact multi-directionally through the third dimension, the "balance of fiscal structure with [its] environment." She has also mapped the indicator types that previous researchers and practitioners, dating back to 1976, have used to evaluate financial condition to her *Dimensions of Fiscal Health in Municipal Governments* Open system framework. Her model illustrates the multi-causal relationships between the subsets of factors used in earlier models (Hendrick, 2004).

In addition to Hendrick (2004), Kavanagh (2007) also introduced a framework to evaluate financial condition that reflects an organizational theory approach, conceptually similar to the one Bolman & Deals (2008) use to assess organizational effectiveness. These organizational theorists assert that every organization "needs to respond to a

universal system of parameters (p. 62)." In other words, the health of any organization is dependent on how well it responds and adapts to its environment. From an organizational perspective, the financial condition of local government cannot be assessed in a vacuum, absent its interactions with its environment.

While Hendrick's Open System model is compelling, it does not lend itself to operational feasibility. However, a synergy exists between the practitioner models developed by Nollenberger et al. (2003) and Kavanagh (2007). While the Grove et al.'s Pseudo-open model provided a source book for evaluating local government financial condition, Kavanagh (2007) added a more expansive strategic organizational perspective to their work. He does not discuss all the FTMS indicators known to potentially affect financial health—presumably because users of Kavanagh's Fiscal Environment Analysis (FEA) approach can simply refer to Nollenberger et al.'s (2003) FTMS indicator analysis sourcebook for qualitative heuristics. Similarly, he does he provide near the level of theoretical detail found in Hendrick's discussion regarding how the various proxies interact within the Open system (Hendrick, 2004).

More specifically, Kavanagh (2007) added three significant components to the literature. Namely, he was the first to package government financial analysis components by strategic management objectives (Table 4.1): *sufficiency, flexibility, vitality, equity, demand, and political environment*, instead of by type of indicator (environmental, organizational, financial). His Open system model provided an organizational perspective much more aligned with what strategic planners, local government boards, and external audiences, not fluent in public finance and governmental accounting could

digest. His model is audience sensitive (Tufte, 2006). Second, Kavanagh embellishes on the methods found in the FTMS for forecasting revenue and expenditure indicator values and trends. Lastly, it is the only model that provides guidance on monitoring and collecting strategic information from the environment (Kavanagh, 2007). Using Kavanagh's FEA approach in tandem with the FTMS approach, yields a practical and more expansive framework for developing an analytical framework tailored to the circumstances of a given jurisdiction.

Table 4.1: Strategic Management Objectives of Fiscal Environment Analysis[a]

Sufficiency	Capacity to secure the resources necessary to provide established service levels.
Flexibility	Ability to reallocate resources to meet changing requirements.
Vitality	Economic potential of a community to generate sufficient resources to meet future service level requirements.
Equity	Allocation of the tax burden used to fund government.
Demand	Alignment of the demand for services and the revenues available to fund them.
Political	Aspects of the political environment that affect financial condition.

a: Kavanagh (2007)

The strategic nature of Kavanagh's Open system model assists local governments with identifying their strengths, weaknesses, opportunities, and threats/challenges/constraints. The product of the FEA model is a local government finance adaptation of a commonly used strategic planning tool, SWOC (Bryson, 2004; Wooton & Horne, 2010). This strategic aspect of the FEA model addresses an Open system component not addressed in the other models. The Closed and Pseudo-Open model approaches identify, evaluate, and plan for the impact of shifting fiscal condition

after change has occurred. Conversely, Kavanagh's model evaluates current financial condition as well as actively monitors what is going on in its environment that may affect financial condition before it occurs. Although the FTMS model looks out to the future based on the trajectory of indicator trends, it does not provide provisions for screening what may be headed toward the organization outside of the jurisdiction's control. The FEA model increases an organization's time to prepare for threats to financial stability and to potentially to mitigate impact.

Unlike virtually all of the literature, the Nollenberger et al. and Kavanagh models are unique in that they are designed for users to tailor a custom analytical model specific to their circumstances (Groves et al., 1980; Groves et al. 2003; Kavanagh, 2007). These approaches are far from incompatible or contradictory; rather, together they provide a road map for a comprehensive and practical Open systems approach. Combined, these models provide an over-expansive buffet of elements known to affect fiscal health and encourage local governments to build their own analytical framework for measuring and evaluating financial condition. These two models are congruent with the most recurrent theme found throughout the literature. That is, an optimal or universal methodology for measuring and evaluating the financial condition of local government does not exist (Carmeli, 2003; Dollery & Crase, 2006; Groves et al., 2003; Hendrick, 2004; Honadle et al., 2004; Levine, Justice & Scorsone, 2012; Kavanagh, 2007; Sohl et al., 2009; Wang et al., 2009).

Regression Analysis

Using her *Dimensions of Fiscal Health in Municipal Governments* Open System framework, Hendrick (2004) specifies three regression equations, one for each dimension of her theoretical model: "Properties of government's environment," "Balance of fiscal structure with environment," and "Properties of the government's fiscal structure (p. 82)." She uses data from 264 Chicago suburbs between 1997 and 2000. She isolates her analysis to a subset of these three interacting elements of financial condition by using 19 variables to proxy for revenue wealth, spending needs, and fiscal slack. Where "slack" is defined as the capacity of a government's fiscal structure to respond to uncertainty and changes in the environment over multiple years. While the results of her regression analyses are intuitively sound, the study does not include t-statistics or p-values that would indicate the level of confidence we can have that the variables used are statistically significant. In addition to her regression analyses, and similar to Wang et al. (2007), she correlates her slack index with her other indices and her proxy variables. As with Wang et al. (2007), Hendrick (2004) demonstrates these correlations are extremely significant in 11 out of the 16 correlations-- we can be 99.9% confident (Studenmund, 2011) that the compared values move together. However, as with Wang et. al (2007), this is to be expected since most of these variables are largely comprised of shared base data components.

Simultaneous Equations

While the regression model that Krishnakumar et al. (2010) have developed is not specifically designed to measure and evaluate financial condition, it is illustrative and

conceptually similar to the Open systems theory that underlie the approaches of Hendrick (2004) and Kavanagh (2007). Krishnakumar et al. (2010) mathematically model fiscal surplus or deficit as a function of several interdependent variables that simultaneously drive government revenues and expenses. These researchers capture what Hendrick (2004), Kloha et al. (2005), and Wang et al. (2007) were attempting with less sophisticated mathematics: identify the strength and magnitude that each indicator imposes on financial condition. Krishnamakur et al. (2010) demonstrate the potential of simultaneous equation models to determine the magnitude and significance of variables that are simultaneously explanatory and dependent. Conceptually, this model mathematically represents the revenue and expense aspect of what Wang et al. (2007) describe as the "relationship between financial condition and socioeconomic condition." Where "socioeconomic condition → financial condition of a government → financial capabilities of a government→ socioeconomic conditions (p. 11)." While the complexity of a simultaneous equations model is presumably outside the skill set of most public finance practitioners and not likely a feasible operational assessment approach, it suggests that mathematical models can be used to describe Open Systems environments such as local government finance. Potentially, such a model could be universalized to at least get a firmer grasp on the magnitude and efficacy of the various factors that influence local government financial condition.

Financial Management Practices

Methodology for quantifying the effect of management practices on financial condition are virtually absent in the literature on measuring and evaluating financial

condition. Kavanagh (2007) provides a brief discussion as to factors that influence fiscal health. Groves et al. (2003) offers a much more prescriptive discussion for evaluating financial management practices. While the authors do not attempt to quantitatively measure it, they provide a qualitative rubric for assessing financial practices. This rubric consists of a list of 9 practices that put pressure on fiscal status such as "using short-term borrowing to balance the budget, deferring pension liabilities, and ignoring full-life cycle costs of capital assets." Three questions must be answered for each practice (p. 149). The "yes, no, not sure" responses visually illustrate patterns of practices that are potentially detrimental to financial condition.

Chapter 5

RECURRING DATA AND MODEL SPECIFICATION LIMITATIONS

Enhanced decision-making is the primary objective of developing models to measure, assess, and predict financial condition. Constructing straightforward and operationally practical models to define the public finance environment is not an exact science—especially since a number of causal factors lie outside the realm of local government. First, the concept being measured must be defined. Second, the concept must be operationally defined. Success requires that a measure be specific, observable, and measurable. Selecting the research procedures and metrics that will represent a conceptual definition is a matter of both creativity and judgment (Singleton & Straits, 2010). Since a uniform definition of financial condition does not exist, the operational definitions between models can appear somewhat arbitrary. Additionally, due to the complexity and dynamics involved in modeling local government financial condition, several limitations recur throughout the literature. Singleton and Straights (2010) remind us that although "no measure is perfect… an imperfect measure is better than none at all."

Ultimately, the usefulness of a model as a decision-making tool depends on three primary factors: *validity, reliability, and feasibility*. *Validity* is a measure of "goodness of fit." That is, how accurately does a model capture what it alleges to measure? *Reliability* is a measure of repeatability and consistency. How dependable are the results between similar applications and over time (Singleton & Straits, 2010)? *Feasibility* is a measure of an organization's capacity to effectively implement a tool (Justice &

Scorsone, 2012). Tables 5.1 summarizes the recurring Data Limitations that manifest throughout the literature.

Table 5.1: Data Limitations

	Measurement Issue	
	Validity	Reliability
Data Availability	X	X
Data Accuracy		
Timeliness of Data Capture	X	X
Anomalies in the Data	X	X
Reference Group Selection	X	X
Indicator Scaling	X	X

Data Limitations

Data availability, accessibility, accuracy, and timeliness are foundational to measuring and evaluating financial condition. Unavailable data that is known to be influential to assessing financial health diminishes model's content validity and predictive potential. Similar to availability, acquiring the data the model prescribes may prove time-consuming and costly. Again, the trade-off is diminished results. Data timeliness is equally critical to preferred outcomes. If it takes too long to retrieve the data of interest, the model's predictable properties may have passed. Similarly, comparing current data to historical benchmarks is not necessarily valid—especially if

significant economic or one-time events have occurred that substantially alter the way the data behaves between periods. In general, the point is that the validity and reliability of quantitative models are only as worthy as the data upon which they are built (Sanders & Ritzman, 2004).

Data Availability

The data requirements for each model determine the level of effort necessary for collection. Often not all of the data of interest is readily available. Either it has never been stored or reported, it is not available in a suitable format, it has not been stored over enough historical periods, or it has been aggregated with other data that is not of interest (Honadle et al., 2004). Groves et al. (1981) found that lacking historical data and changes in data aggregation rules between time periods was often common and problematic. Honadle et al. (2004) suggests that while a full application of the Grove et al.'s FTMS indicators provide an expansive view of local fiscal health, much of the data needed to calculate the indicators is not available in regular financial statements or if it exists, it is not in the right format to be used. Groves et al. (2003) note that some financial data may need to be pulled from end-of-the-year-ledger accounts. Additionally, non-financial data may need to come from various departments such as human resources, public works, and planning, as well as other external sources such as the U.S. Census, Chamber of Commerce, and perhaps the state's Department of the Treasury. That said, the most frequently used indicators (Table 2.1) can typically be derived using information available in a jurisdiction's financial reports, but they may overlook integral components relevant to overall fiscal health.

Data Accuracy

Timeliness of data capture. Two limitations present due to the timing of data capture. First, the models developed by Brown (1993) and Maher and Nollenberger (2009) recommended comparing current period indicators to historical benchmarks. The benchmarks developed by Brown (1993) are based on data from 1989. The benchmarks developed by Maher and Nollenberger (2009) are derived by averaging four years of data, 2003-2006. These models suggested comparing a jurisdiction's current indicator values to dated benchmarks. These approaches assumed that indicator values remain relatively constant over time and that comparing them across different time periods without any accommodation for exogenous one-time events, major swings in the economy, organizational changes or internal accounting changes. Berne and Schram (1986) cautioned that changes across periods may be more reflective of changes in "clientele" and an organization rather than the measure being compared, emphasizing the necessity of qualitative judgment based on context and the role of non-financial data. However, in theory, a large enough sample size would mitigate for jurisdiction-specific aberrations (Hendrick, 2004; Studenmund, 2010). Lastly, none of the prominent studies in the literature use data from periods when the economy was in a downturn. All of these studies built their models on data that was captured during periods of stability and upswings in the national economy (Brown, 1993; Hendrick, 2004; Kloha et al., 2005; Maher & Nollenberger, 2009; Wang, 2003). It would be interesting to see how these models fare if built on data during less stable economic times.

Anomalies in the data. Data can be inaccurately entered or inconsistently maintained. Fiscal policy varies from county to county and overtime. Budget categories can change between periods. Definitions may not remain consistent over time. One-time administrative changes and events such as tax rate changes, number of employees, and service changes also affect numbers (Honadle et al., 2004; Kavanagh, 2007). Additionally, the operations that are included in one county's general fund are not necessarily included in another's general fund, tainting cross-jurisdictional comparisons. The relative size of a general fund varies between jurisdictions. The phasing in of new reporting changes GASB 34 and GASB 45 can make the contents of reporting inconsistent from year to year (Sohl et al., 2009). It is critical for users of fiscal data to be aware of these differences so that they can be accommodated for in the analysis. Otherwise, users risk producing assessments that may not accurately reflect reality (Kavanagh, 2007).

Reference group selection. A huge divide exist in the literature regarding how to go about locating like jurisdictions that are suitable for making accurate comparisons. Brown (1993) and Maher and Nollenberger (2009) averaged indicator values from 100s of similarly sized jurisdictions using population as the sole criterion for matching like jurisdictions. Conversely, the remaining Closed system models that include socioeconomic data in their analysis emphatically claim that population alone is not accurate for identifying jurisdictions with similar fiscal environments (Campbell, 1990; Sohl, 2009.) To date, Sohl et al. (2009), drawing from a municipal compensation framework model, have laid out the most extensive and substantive list of descriptive

environmental variables necessary to accurately identifying comparable jurisdictions. Chaney et al. (2002) also strongly cautioned about using population as a sole determinant, stating that "even governments of similar size and geographic location may not be comparable if they have drastically different revenue sources or operating issues and accounting approaches (p. 30). These views are also supported by the Pseudo-Open and Open system authors (Hendrick, 2004; Kavanagh, 2007; Nollenberger, 2003). Additionally, the benchmarking data would be generated from a random sample as well. Brown (1993) and Nollenberger et al. (2009) noted that the data pulled from700 jurisdictions they used in the GFOA Database was not as random as ideal since it is comprised of participating municipalities that are motivated to win an award for their fiscal practices. It is also presumable that these participants have better than average fiscal health or they may not be inclined to participate in a nationwide study.

The risks of relying on jurisdictional benchmarking are well covered. The caveats of cross-jurisdictional comparisons are threefold. First, due to the level of diversity between local governments, the idea that population size is not a viable predictor of jurisdiction likeness dates back to the earlier macroeconomic theorists. These authors found that the varying political entity responses, fiscal management practices, tax burdens, and citizens' willingness to pay significantly influenced the fiscal characteristics and behavior of similarly sized local jurisdictions (Pammer, 1990; Stonecash et al., 1981; Tiebout, 1956). Second, Campbell (1990) cautioned against using cross-jurisdictional comparisons because an aberrant negative socioeconomic event in one jurisdiction would inaccurately create the appearance that other cohorts improved when in actuality they did

not change. Lastly, if an entire region is depressed, the least depressed will appear relatively healthy. Even the highest performer in a region may not serve as valid and reliable benchmark for comparison with jurisdictions within the region or external to it (Campbell, 1990). Additionally, I would caution about comparing current years indicator values to aged benchmarking averages.

Scaling within a jurisdiction. Within a jurisdiction, most models suggest measuring revenue and expenditure indicators using constant dollars to adjust for inflation and real purchasing power. The practice of not using current dollars could make indicators inaccurately appear favorable or unfavorable. These models also advise factoring many indicators by population to identify revenue and spending changes relative to population. Conversely, several authors caution that population size is not always the most appropriate basis for standardizing these measures size (Hendrick, 2004; Nollenberger et al. 2003; Kavanagh, 2007; Maher & Nollenberg, 2009). They contend that demographic factors within the population, such as age of population, employment, and zoning may generate distortions not found in more socioeconomically balanced jurisdictions. For example, a low-density residential jurisdiction with high-density commercial and industrial would result in a distorted revenues and expenditures picture if simply adjusted on a per capita basis. In general, they stress that the most suitable scaling factors must be selected based on a jurisdiction's unique characteristics.

Model Specification Limitations

As discussed, model integrity is highly dependent on data availability and accuracy. The structural design of a model is equally important. As previously

mentioned, the last 30 years of local government financial condition research has not produced a one-size-fits-all model. Neither researchers nor practitioners have been able to empirically substantiate, with statistical robustness, the efficacy of one model over another, one indicator over another nor the strength and relative magnitude of the relationships between indicators and overall financial health (Carmeli, 2003; Groves et al., 2003; Hendrick, 2004; Honadle et al., 2004; Justice & Scorsone (2012); Kavanagh, 2007; Sohl, 2010; Wang, 2007). Without agreement on what defines fiscal condition and how to measure it, it makes sense that we are unable to empirically determine the efficacy of its numerous aspects (J. Justice, personal communication, September 9, 2011). Table 5.2 summarizes recurrent limitations in the model specifications found in the literature.

Table 5.2: Model Specification Limitations		
	Measurement Issue	
	Validity	Reliability
Data Approach		
General Fund	X	X
Government Wide	X	X
Strategic	X	X
Technical Approach		
Indicator Analysis	X	X
Cross-Jurisdictional Analysis	X	X
Composite	X	X
Correlation Analysis	X	X
Regression Analysis	X	X
Simultaneous Equations	X	X
Fiscal Environment Analysis	X	X

Data Approach

Interestingly, the primary divide in the literature is between using strictly financial system indicators (Brown, 1993; Chaney, 2002; Maher & Nollenberger, 2009; Sohl,

2009; Wang, 2010) or using a combination of environmental, organizational, and financial factors to assess financial condition (Hendrick, 2004; Kavanagh, 2007; Nollenberger et al., 2003). It appears that there is a relationship between the data approach taken and the authors' professional disciplines. Although there is much agreement on the factors to consider when analyzing financial condition, there is no consensus on how to use them to evaluate local government (Nollenberger, 2003). As such, there is a notable lack of continuity between indicators and approaches in the literature (Kloha, 2005). The data factors included in each model can appear rather arbitrary. While this may seem troublesome, it simply reflects the difficulty involved with modeling such a complex and dynamic environment. Singleton & Straits (2010) reinforce that defining the best fit between a conceptual construct [financial condition] and operational measure is "largely a matter of creativity, judgment, and practicality (p. 125). I would add "awareness."

General Fund

Although deriving indicators solely from readily available general fund data is expedient, it bears three potential risks. First, fund level data measures only a subset of a jurisdiction's financial picture. Second, depending on the size of an entity's general fund relative to other funds, the general fund data does not necessarily provide an accurate reflection of overall financial condition. Lastly, it chances missing critical elements of the external environment and organization that may affect financial condition (e.g., financial management practices, shifting intergovernmental relationships, and economic activity).

Government-Wide

Using government-wide financial data enables users to better monitor spending and assess overall financial condition. Government financial condition can be measured as a whole versus being restricted to separate fund levels. Additionally, since the GASB 34 government-wide reporting requirements are prepared using the full accrual basis of accounting, revenues and expenditures are more reflective of financial condition. Lastly, the economic resources measurement focus necessitates the inclusion of capital assets, depreciation information, and long-term debt obligations. As such, it represents a much more accurate view of an entire organization's fiscal health (Chaney et al., 2002; Wang et al., 2007). However, as with strict fund-based analysis, restricting financial condition assessment strictly to government-wide reporting data limits visibility to environmental factors that also influence overall financial condition and could broadside a jurisdiction.

Strategic

Models that incorporate historical, current, and estimated future internal and external data, while the most labor intensive, have the potential to be the most valid predictors of financial condition. Models that view both internal and external data to assess financial condition have the potential to more realistically reflect overall financial condition because they also account for the relationships between a jurisdiction financial condition and its environment (Kavanagh, 2007).

Technical Approach

Regardless of model design, what researchers do agree on is that the quality of any forecast is greatly improved based on the forecaster's domain and context

knowledge, regardless of technical approach (Sanders & Ritzman, 1992, 2004). First, an analyst needs sufficient public finance and governmental accounting experience to qualitatively understand what financial indicators represent, how they are interrelated, and how they affect each other (Kavanagh, 2007). Second, an analyst must be familiar enough with the domain of their internal environment to have become familiar with myriad cause-effect relationships. Thirdly, the analyst needs to be attuned to the ongoing dynamics of the external contextual environment and how they affect internal forecasts (Kavanagh, 2007; Sanders & Ritzman, 2004).

Studies have validated that technical expertise alone is an inferior substitute for experiential knowledge. Similarly, judgment based forecasts have been demonstrated superior to strictly quantitative ones depending on the environment under study. This is not to say that quantitative forecasts are without merit; rather, they often need to be interpreted and adjusted based on context and domain knowledge (Sanders & Ritzman, 1992; Sanders & Ritzman, 2004). Kavanagh (2007) reported that many smaller jurisdictions studied through the GFOA, have derived equal if not superior forecasts using the judgmental approach in lieu of complex analytical tools.

Indicator Analysis

The backbone of the various technical approaches for measuring and evaluating financial condition rests on indicator analysis-- particularly financial ratio analysis. Yet, even as its foundation, indicator analysis bears some limitations. Being aware of the territory of indicator analysis is more important than the map itself. While indicators

have been criticized for being ambiguous, not bearing empirical weight, and absent of normative standards, they remain the tool of choice.

Whether indicators are being evaluated standalone or as a component of a larger model, they must always be considered context sensitive. As such, indicators can appear ambiguous. An increase in population could enhance or degrade financial condition depending on the characteristics of the growing population segment. For example, increases in school age and retirement age population can put increased pressures on service demand. Conversely, an increase in single working professionals could increase revenues and require fewer public services. Indicators frequently require simultaneous evaluation. For example, increasing restricted fund balances may initially appear very troublesome prior to comparing them to unrestricted intergovernmental transfers and discovering that the later has risen at a much higher rate and in absolute terms.

The biggest disappointment with indicator analysis in the public sector is that the strength and magnitude of the indicators with respect to financial condition is not available. Granted, it is obvious that some indicators are more influential than the others. No one would argue that assessed property value affects revenues more than crime rate. But, then again, property values are tethered to crime rates. At what point do shifts in the crime rate become a noteworthy influence to revenues? At what point do increasing gas prices begin to lessen the demand for suburban housing and its assessed value? It depends—not just on gas prices and vehicle miles traveled, but a host of additional factors that shape how homebuyers assign values to property. What percentage of the jurisdiction is metropolitan versus suburban? Are alternative, more cost effective

commuting options available? Did one of the jurisdiction's top 5 taxpayers leave the state? The point is that the dynamic and contextual nature of indicator analysis has, to date, restricted the development of macro-level benchmarks.

Cross-Jurisdictional Comparisons

Recognizing the significance between a community's characteristics and circumstances, cross-jurisdictional models were designed to control for this diversity. In theory, benchmarks would be more effective at a more micro-level that did not attempt to represent all jurisdictions. Unfortunately, standardizing indicator analysis at the similar-jurisdiction level has not proven any more empirically fruitful than its macro-level counterparts. The most noted criticisms of these models mirror those previously associated with indicator analysis. Yet, I would stress that the cross-jurisdictional comparison models are much more time and data intensive without any assurance of increased evaluative merit.

Composite Scores, Indexes, and Ranking

These models are developed to simplify financial condition evaluation. Values of multiple indicators are merged together using a variety of algorithms, composite scores are then indexed, ranked, and/or scored. The apparent simplicity of using these models is appealing: evaluating one contrived indicator is easier than simultaneously dealing with multiple individual indicators. However, the downside of these technical approaches is that the engineered scores, similar to aggregated data, can bury unfavorable indicator values at the individual level that could require additional analysis and/or harm financial condition.

Trend Analysis

Trend analysis is a powerful forecasting approach, yet it must be undertaken with caution due to several conditions that can undermine validity. Forecaster's cannot assume that trend trajectories will continue in the same direction without fluctuation overtime. Simply plugging numbers into automated estimating tools does not guarantee accurate results. The impediments to accurate trend forecasting are primarily a function of data, knowledge, and judgment.

Using aggregated data can result in misleading trend projections. An extreme example would be trending the aggregate "revenues/capita." While bundled, it may appear that revenues are increasing when in fact the subcomponents are all behaving very differently. For example, the revenues/capita may appear stable while restricted revenues are going up and intergovernmental revenues are going down. Moreover, the subcomponents of an aggregated trend can be moving in opposite directions and canceling each other out. For example, one-time revenues are canceling out declines in tax revenues. Trend forecast effectiveness can also be jeopardized by data inconsistency between multiple periods. Forecaster's must be aware and adjust for substantial administrative changes and one-time events that would skew forecast results (e.g., fund rearrangements, tax rate changes, lay-offs, service additions, severe recessions).

Both Nollenberger et al. (2003) and the GFOA (n.d.) provide simple overviews for generating trend forecasts. Certainly, the "ideal" trend trajectory of a financial indicator would be one that remained linearly consistent over time without significant fluctuations. Nollenberger et al. (2003) state that while this may be reasonable when

looking forward one to two years, they suggest that when forecasting long-term trends, especially for less indicators that have historically displayed less stability, requires the adoption of more advanced time series analysis and forecasting resources than they have presented, necessitating the expertise of consultants. The *GFOA MuniCast Forecasting Guide*, mentions approaches for validating forecasts: residual analysis, sensitivity analysis, t-statistic, coefficient of determination (R^2), and p-value (Government Finance Officer's Association, n.d.). However, it does not provide sufficient direction regarding the theoretical statistical underpinnings of the models to determine model accuracy from a statistical perspective. Kavanagh (2007) cautions that even the more sophisticated quantitative estimation techniques do not automatically ensure more precise forecasts. Again, emphasizing the criticality of a forecaster's knowledge and experience, as well as expert domain and context knowledge are paramount to projecting future trends (p. 125).

Correlation Analysis

Correlation analysis, also known as bi-variate analysis, is frequently misunderstood and consequently misused. Correlation identifies variables, in this case indicators of financial condition, that move together. Correlation *does not* indicate causality. For example, if every time indicator A goes up N%, indicator B also goes up N%, this does not mean that A causes B to increase. It means that the indicators move together. It is likely that A and B are both driven by the same causal factor. By definition, variation in individual indicators or indexes that are derived or driven from shared variable data will be correlated. This establishes relation, not causation. Two indicators derived of mutually exclusive data that moved together would be more

suggestive of cause than those comprised with shared data components and/or causal factors.

Regression Analysis

The Ordinary Least Squares (OLS) analysis model, also referred to as regression analysis or multi-variate analysis, used by Hendrick (2004) and suggested by both Nollenberger et al. (2003) and Kavanagh (2007), is not a weakness in and of itself. The literature indicates that regression analysis is most limited by the researchers and practitioners knowledge. Rather, the model is powerful, yet the application has been limited.

The validity of an estimated regression equation rests on the presence of seven classical assumptions. If a model does not satisfy all of these assumptions, the ordinary least squares (OLS) regression model cannot be said to be the best estimator available (Studenmund, 2011). The OLS models available in the literature on evaluating local government financial do not indicate if they were examined to determine if any of the classical assumptions were violated (Barreca, 2010; Hendrick, 2004; Jones & Walker (2007); Dollery & Crase, 2006). Therefore, despite their theoretical underpinnings, determining their effectiveness is difficult. Similarly, with the exception of Barreca (2010) and Jones & Walker (2007), these regression model studies do not include t-scores or p-values. This prohibits the reader from determining the validity of an explanatory variable with respect to the independent variable. It precludes determination of the statistical significance of the estimated direction and magnitude of slope coefficients. That is, the level of confidence we can have that the value of the coefficients are other

than random error and reliable (Studenmund, 2010). Models that violate classical assumptions can appear to be statistically sound, when in fact they are not, regardless of reporting high R^2, high adjusted R^2, t-scores and p-values. In other words, models that violate classical assumptions will appear sound when in fact they are subject to multiple conditions that will increase the number of Type 1 and Type 2 errors.

These errors are generated when irrelevant variables are included in a specification, when prominent explanatory variables are omitted from an equation, when linear relationships exist between explanatory variables (multicollinearity), when the order of observations in the dataset has a meaning (serial correlation), and when there is not a constant variance between each observations' error terms (heteroskedasticity). These conditions can be tested for through multiple analytical tools. If present, they typically can be corrected or at worst case mitigated, through the use of additional statistical techniques (Studenmund, 2011).

Simultaneous Equations

Although I did not locate any simultaneous equations models in the literature for measuring and evaluating financial conditions, I believe that they have the optimal choice for accurately reflecting and quantifying the theory underlying the Open systems models. Simultaneous equations approaches lend themselves to modeling and estimating situations loaded with endogenous variables. Endogenous simply means that a given variable A is influenced by explanatory variable B and conversely, variable B is influenced by explanatory variable A. In other words the relationship is bi-causal. Each variable causes change in the other variable and is affected by the other variable as well.

That said, while these models have inordinate potential they equally necessitate expertise to use them correctly. I am not practiced with simultaneous equations models yet, given their complexity, I trust that effective utilization of these software applications demands at least the same amount of theoretical knowledge as do regression models in order to not violate the theoretical assumptions they are built upon.

Fiscal Environment Analysis

Fiscal Environment Analysis' strength could be argued to be its limitation. Since FEA is so adaptable and open ended, users could get lost in monitoring countless factors, many of which carry little weight with regards to assessing local financial condition and revenue/expenditure projections in the long-term. For this reason, it is important for users to work their way outward into the environment, focused on the factors and drivers that are closest to home. For example, the regional unemployment rate versus the national unemployment rate or warning signs of a global banking crisis. While it is important to be aware the continuum of factors that influence overall financial conditions, the local and regional, particularly economic factors, are typically the most relevant. FEA users must also guard against getting so focused on certain strategic management objectives that crucial elements of the remaining strategic management objectives are neglected. The FEA model directs users how to focus on different objectives, yet balance across all the objectives remains essential in the long run

Timeliness of Threat Notification

The distinction between the "prediction" and the "early warning" of unfavorable financial condition is nebulous. For example, Kloha et al. (2005) illustrated that their

model did exhibit "predictive" capability based on applying it to historical data. Wang et al. (2007) illustrated that socioeconomic indicators were highly correlated to their measure of financial condition, stating that it had "predictive validity." Yet, I would characterize these current models as much more sophisticated versions of the early warning systems that arose in the aftermath of New York City's 1975 default. These models were designed to recognize jurisdictions with the potential for fiscal instability; they do not predict the expected magnitude of quantitative change in financial condition for future periods, nor do they provide any statistically based probability or margin of error. Instead, they provide notification of potentially emergent fiscal troubles (Congressional ACIR, 1973; ACIR, 1979; Budget Office, 1978; U.S. Department of Treasury, 1978). Conversely, while the indicator trending models may extrapolate out indicators, they do not claim to predict financial condition; rather they provide notification of potential problems requiring additional analysis (Nollenberger et al., 2003; Kavanagh, 2007).

It would be more helpful to categorize the models in the literature in terms of "timeliness of threat notification." For example, Nollenberger et al. (2003) could be viewed as predicting financial condition, since estimated trend trajectories are used to identify latent problems at the indicator level, I would challenge that this is a less timely prediction than a properly specified regression model could generate. The FTMS trend is relegated to one trend at a time and is not explanative of overall financial condition. Conversely, a robust regression model, has the potential to provide much more accurate and timely predictions of overall future financial condition. It has the ability to account

for the magnitude and relative weight of each indicator that influences financial condition (Studenmund, 2010). Trend by trend analysis lacks this capability. Another time-dependent limitation of trend forecasts is that they must be plotted over a period of time, typically a year, before provide insight. This increases the amount of time that could pass before identifying a potential problem. Trending over smaller intervals, months or even daily, most likely would not be an effective way to increase the timeliness of identifying potential issues due to the nature of trend data because they do not capture enough data to recognize consistent patterns. Additionally, smaller intervals could make smaller changes appear more substantial than they are because the data does not span enough time to illustrate the broader perspective.

Chapter 6

STRENGTHS IN MODEL DESIGN

As has been mentioned several times throughout this analysis, the empirical efficacy of the models available for measuring and evaluating the financial condition of local government are nonexistent. As such, I have made relative assessments about the strength of prominent models found in the literature. I accomplished this by identifying six attributes that make financial condition evaluation models effective from a cost and benefit perspective: *Dialogue, Education & Buy-In*, *Feasibility*, *Ease of Use*, *Efficiency*, *Adaptability*, *and Predictive Capacity/Payoff*. I believe that they capture the trade-offs inherent in making decisions and managing any project. For example, models with high *Predictive Capacity/Payoff* are limited in value if implementing them is not feasible due to resource constraints. Conversely, high *Feasibility* models are of little value if they provide minimal predictive capability. Table 6.1: Model Strengths by Author summarizes my conclusions.

Table 6.1: Model Strengths by Author

Author	Dialogue, Education, Buy-In	Feasibility	Ease of Use	Efficiency	Adaptability	Predictive Capacity/ Payoff
Groves & Godsey (1980)	H	M	H	M	H	H
Berne & Schramm (1986)	L	M	M	L	L	L
Brown (1993)	L	H	H	H	L	M
Chaney, Mead, & Schermann (2002)	L	H	H	H	L	L
Nollenberger, Groves, & Valente (2003)	H	M	H	M	H	H
Hendrick (2004)	H	L	L	L	H	H
Kloha, Weissert, & Kleine (2005)	L	M	H	M	L	L[a]
Wang, Dennis, & Tu (2007)	M	M	L	L	L	M
Maher & Nollenberger (2009)	L	H	H	H	L	M
Kavanagh (2007)	H	M	M	M	H	H
Sohl, Peddle, Thurmaier, Wood, & Kuhn (2009)	H	L	L	L	L	M
Krishnakumar, Martin, & Soguel (2010)	L	L	L	L	H	H

Where H = high strength potential; M = medium strength potential; L = low strength potential
a: although this model exhibits predictive capacity within Michigan's counties, the design appears to have backed into the data to a degree

Dialogue, Education, Buy-in

Getting an organization excited and up to speed about the value of monitoring and predicting financial condition beyond cash and budgetary solvency requires a paradigm shift for most public finance entities. Models equipped with tools that stimulate interactive dialogue between management, employees, the board of supervisors, external agencies, and the public are pivotal to dialogue and education (Hendrick, 2004; Kavanagh, 2007, Nollenberger et al., 2003). The attribute *Dialogue, Education, and Buy-in* represents the degree that a given model facilitates communication between all stakeholders, builds congruent understanding about what is necessary to maintain and sustain financial health, and assists with gathering agreement on how it will be accomplished.

Feasibility

In addition to fostering understanding, a model must be operationally feasible. While a handful of the models from academia appear to display some level of predictive power and high potential, they lack the practicality and refinement demanded in an operations environment (Hendrick, 2004; Sohl et al., 2010; Wang et al., 2009). Although these models have become more telling and sophisticated over time, the level of complexity remains a barrier to their use in the public finance community. For example, the conceptual model that Hendrick lays out scores very high on *Dialogue, Education, and Buy-in*. While it intuitively makes good sense and is rooted in widely accepted theory, the complexity of implementing it is likely beyond the scope of most public finance agencies. Similarly, Wang et al. (2007) and Sohl et al. (2009) have assembled

highly technical models, yet they continue to challenge practical implementation. The attribute of *Feasibility* represents the likelihood that a model could be used in day to day practice of measuring and evaluating financial condition. In this context, *Feasibility* also includes obstacles associated with using models with extensive data collection and maintenance requirements.

Ease of Use

Each model requires varying levels of contextual and domain knowledge to implement it. Similarly, effective evaluation and maintenance of an analytical model demands that public finance professionals possess a continuum of cross-disciplinary awareness. *Ease of Use* represents the amount of knowledge necessary to use a tool and produce a result. Is the model a generic net (Brown, 1993; Maher & Nollenberger, 2009) or does it instruct to capture additional elements relevant to a specific jurisdiction's financial condition (Kavanagh, 2007; Nollenberger et al., 2003).

Efficiency

Resources are costly—especially personnel. The costs associated with maintaining and monitoring a financial condition evaluation model, relative to the benefits it provides must be considered. Undoubtedly, the current static models that rely on 10 or fewer indicators, derived from readily available data are the quickest and least resource intensive methods for monitoring financial condition (Brown, 1993; Chaney et al., 2002; Maher & Nollenberger, 2009). All the same, while other models may extract higher upfront development costs, the potential additional benefits incurred on the backend in terms of more accuracy and timeliness may outweigh the initial investment

over time (Kavanagh, 2007; Nollenberger et al., 2003). Conceivably, once a customized analytical model has been developed, maintaining it may require not many more resources than the generic quick and dirty models. *Efficiency* indicates the trade-off between resource costs and the potential predictive benefits.

Adaptability

Adaptability distinguishes the level of flexibility and options supported within a model to tailor it to a specific jurisdiction's characteristics. Obviously, the ICMA FTMS model (Nollenberger et al., 2003) and the GFOA long term financial planning FEA model (Kavanagh, 2007) provide the highest level of operational options, yet these bare opportunity costs. The beauty of the models with provisions for adaptation is that they provide a consistent framework for identifying, measuring, and presenting financial condition analysis results-- even when the underlying individual components may have changed.

Predictive Capacity/Payoff

The attribute *Predictive Capacity/Payoff* represents a model's capacity to generate benefits due to its ability to hone in on emerging threats, opportunities, and constraints that potentially affect financial condition beyond the current budget year. There are models in the literature with the potential to more accurately measure and predict financial condition (Hendrick, 2004; Wang et al., 2007; Sohl et al., 2009 ; Krishnakumar et al., 2010). Yet, none of them have demonstrated that these more resource intensive methods were more effective determinants of local government financial condition, as compared to those of the less resource intensive practitioner models (Kavanagh, 2007;

Maher & Nollenberger, 2009; Nollenberger, 2003). Based on several jurisdictions that were studied, Kavanagh (2007) notes that they did not find that regression analysis models yielded any greater predictive ability than their trending approaches.

Ideally, the highest capacity predictive models would quantitatively estimate the magnitude and level of certainty that expect change in one variable causes in another, holding all other variables constant. Such a model could be also be used to perform sensitivity analysis and ascertain critical thresholds for a given variable. Higher *Payoff* models provide much more than simply qualitatively describing the factors known to influence financial condition. They enable users to represent what can be expected to occur in the real world. To date, in practice, the strongest *Predictive Capacity/Payoff* presents itself in the contemporary models that make use of trending trajectories (Kavanagh, 2007; Nollenberger et al., 2003). Observing changes as they occur over time, assuming the reviewer knows the territory, enable users to identify shifting behavior patterns, investigate to find the culprits, and adjust accordingly.

Chapter 7

GUIDELINES FOR DEVELOPING A JURISDICTION SPECIFIC ANALYTICAL FRAMEWORK FOR ANALYZING FINANCIAL CONDITION

At first glance, developing a custom analytical model for measuring and evaluating the financial condition of local government appears daunting. Estimating future revenues sounds even more onerous. The good news is that jurisdictions have access to the answers, but simply may not be accustomed to extracting them. Rather than resign to a mindset of "we just have to deal with whatever comes our way," recognize that an analytical framework, consistently applied, increases a jurisdiction's manageability over its future financial condition. Since environmental scanning increases visibility to potential threats, opportunities, and constraints, the integrity of revenue and expenditure projections are enhanced. Jurisdictions must believe that they do have options. Having an expansive mindset can change consequent perceptions of what is possible. Using a framework that enables local governments to respond to the environment as it evolves instead of the conventional model of reacting after the shift is quite empowering.

Do California's counties face inordinate limitations on raising revenues and deciding what services they must provide? The answer is a resounding, "Yes!" That said, fiscal managers still maintain considerable power to influence financial health if formalized financial condition analysis modeling is established as an integral management practice component. Will financial condition analysis solve all the counties

revenue woes? Probably not, yet I encourage the counties to not bequeath the control that they do have in shaping fiscal condition in the long term.

Developing an analytical model customized to the unique characteristics of a jurisdiction requires management support, dedicated resources, and trust that financial condition can be improved, regardless of what the state legislature is brewing. It also requires an organization that is willing to embrace a role of achieving fiscal sustainability in an expansive way, beyond balancing the budget and towards manifesting long term sustainability. Financial environment analysis and projecting revenues/expenditures must be welcomed as an integrated operation— not an isolated project. While what this looks like for each jurisdiction can vary widely, the steps to develop a custom framework are consistent. The five primary components of developing an analytical model are to *Identify and Prioritize Management Objectives, Requirements Analysis, Design, Implementation, and Test/Feedback/Refine.*

Identify and Prioritize Management Objectives

Strategic

Identify and prioritize the primary objectives associated with undertaking the development of an analytical framework for measuring and evaluating financial condition: *sufficiency, flexibility, vitality, equity, demand, political environment* (Kavanagh, 2007). Elaborate qualitatively how it will be known that an objective has been satisfied. Specificity is essential. Identify milestones that are specific, observable, and measureable.

Operational

Identify short term and long-term items of key interest to the organization. Name and rank the largest revenue sources, fund balances, accounts of interest, and programs at both the jurisdiction and department level. Specify the most stable and most volatile revenues. Locate the revenue sources that would be too painful to lose from a political capital perspective. List the revenue sources that attract inordinate attention from stakeholders, even if they may not be revenue-critical. Identify the programs that are the most difficult to fund. Identify "feel good" items that uplift and encourage stakeholders. Identify "target" measures that are indicative of efficient performance. Categorize and rank prioritized revenue items.

Receive commitment from management that recurrent dedicated resources will be provided to design and develop the analytical model, implement it, and refine it as new requirements emerge.

Requirements Analysis

Review Existing Financial Condition Analysis Approach

Identify what revenues, fund balances, accounts, programs and all else is currently being analyzed on a routine basis. Assess how they are being measured and evaluated. Compare and assess these findings to suggestions of Nollenberger et al. (2003), Kavanagh (2007), and Maher and Nollenberger (2009).

Map existing financial condition analysis items and procedures under review to their corresponding solvency type (cash, budgetary, long term, service level) and financial sustainability indicator (County of Yolo, n.d.).

Identify the timing and scheduling of financial condition analysis. Is it consistently applied or random? Is it reactive? Is it proactive? Is it formalized as components of a job description, key accountabilities, core competencies?

Management objectives addressed. Identify and list the management objectives that are presently receiving attention. Identify items receiving coverage that are not included in management objectives.

Management objectives not covered. Identify and list management objectives that are not included in the current processes and procedures.

Gaps. Identify, summarize, and prioritize areas of exposure.

Identify Proxy and Data Requirements to Support Management Objectives

Refer to ICMA's *Evaluating Financial Condition* (Nollenberger et al., 2003) handbook and the GFOA's *Financing the Future* (Kavanagh, 2007) to determine the proxy indicators applicable to satisfying each objective specified by management. It typically requires more than one indicator to represent each management objective. This requires developing a theoretical grasp of all the 43 FTMS indicators (partially replicated in Table 2.1). Understand what each one yields and in what situations it applies. Since the FTMS indicators are categorized based on data origin (e.g., environmental, organizational, and financial), it is necessary to also map the selected indicators by a FEA management objective perspective.

During this initial phase, it is most important to recruit the most often and commonly used measures that represent cash, budgetary, long term, and service-level solvency. Once a baseline model has been established, more specialized indicators can

be added to hone in on particular areas of interest. However, non-standard at risk areas cannot be excluded.

Specify proxy data requirement. Once proxy indicators have been selected to represent management objectives, it is necessary to categorize and catalog the data necessary used to derive them. Be wary of indicators using aggregated data stores. They may require disaggregation to be useful. For example, the bucket "revenue sources" potentially contains multiple tax revenue sources: sales, property, utility, user, etc. Without disaggregating data stores, the jurisdiction risks identifying variations of substance in the each of the individual components. That is, if one subcomponent is increasing while another is decreasing, the overall trend may appear unchanged, and important changes that affect financial condition might be overlooked.

Identify proxy factors and drivers. For each proxy chosen, it is necessary to determine the factors (key influencers) of each data item that comprises a proxy. Kavanagh (2007) suggests mapping out causal chains that illustrate the expected behavior of revenue and expenditure sources known to determine fiscal health. For example, if sales tax revenue is a jurisdictions primary revenue source, it is imperative to understand what factors drive it. These could include national macroeconomic factors, local economic factors, consumer spending, unemployment rate, escalating gas prices--anything that affects the revenue/expenditure item.

Next, the drivers and assumptions associated with each proxy must be identified. It is crucial to recognize that a proxy factor is not the same as a proxy driver. A factor is indirectly causal (e.g., the influence of economic cycles on a proxy value); whereas a

driver is directly causal (e.g., housing prices determine property tax revenues). In this example, a prolonged downward economic cycle (factor) may devalue housing prices, but it does not drive property tax revenues. Assessed value and collection rates drive property tax revenues (drivers).

Enlist proxy and data source specialists. Each primary revenue and expenditure source needs an owner. As corny as it may sound, being a proxy and data specialist requires intimacy, as does any successful long term relationship. Due to the number of variables that can potentially influence a given data store and associated proxy indicator values, revenue and expenditure owners must be phenomenally curious. A specialist really cares about its proxy/data partner and how it is doing. They seek to know everything they can about it. This includes knowing its history, where it came from in the past, where it comes from in the present, and where it will come from in the future. It involves having an awareness of the other proxies and data stores it is related to, key moments of impact that reshaped the way it behaves, elements in the organization or environment that have the potential to shift its behavior going forward (economic, demographic, political climate, legislation, management policy), and its level of sensitivity to influencing factors and defining drivers. What is its historical pattern? Is it stable? Is it volatile? What is its achilles heel? What nurtures it? What diminishes it? What are its buttons? What could harm it? They discuss and compare what is going on in their proxy/data partnership with their friends who also have proxy/data partnerships. They assist each other to see their partner from alternative perspectives—their objective always to aid their friend with additional understanding of what may be evolving or

trying to happen in their respective partnerships. Overtime, as with long-term personal relationships, a specialist will be able to predict how its partner will behave under a given a set of events or circumstance.

In other words, the more intimate someone is with the intricacies of their proxy and data the better equipped they are to spot aspects of the environment and organization that can alter its path. The more we share our discoveries with fellow proxy and data owners in the jurisdiction, the more we augment our organizational knowledge. The result is a much more expansive appreciation of the myriad aspects that actually converge to create overall financial condition. Lastly, this heightened awareness magnifies abilities to recognize subtle changes sooner and to create solutions to uninvited changes.

Develop revenue dictionary. Kavanagh (2007) suggests developing and maintaining an "explicit revenue model." Basically, this is the discipline of maintaining written documentation that identifies, defines, and contains key points of interest about a jurisdiction's revenue sources. This includes source components, assumptions, historical one-time events, and assumptions. This information becomes extremely valuable with respect to interpreting trend data, as well as creating statistical models to predict behavior—especially if there has been a loss in institutional knowledge.

Determine Data Availability

Do not underestimate the magnitude of this task! The outcome of this task can send an organization back to the drawing board. It is expensive to store and maintain historical data at all different levels of detail. Chances are that if it does not show up on a financial report somewhere it may not already exist.

Often the data of interest to derive an indicator/ratio is not available in the format needed or has never been collected. Perhaps only one person knows how to access it. Maybe two departments are already maintaining it for their internal needs, unbeknownst to the rest of the organization. Sometimes users of data simply do not know what it is comprised of and do not know how to find out. Is it aggregated? What subcomponents comprise it? Is it captured timely manner? Is it saved over historical periods—enough to produce a robust trend?

Identify existing usable data stores. Stored data that is usable must be identified and catalogued. Additionally, procedures on how to access the data must be documented.

Identify additional data to be collected and stored. Document the proxy items that cannot be readily derived due to lacking input data. Document proxy items that can be derived from existing data, but will require intermediate manipulation of multiple data stores to create the data stores that the proxy requires.

Establish environmental and organizational data sources to monitor. Based on the output of the causal chains developed for each data item, determine where the proxy/data owner will acquire environmental trigger information that influences their data/proxy indicator. A variety of sources may exist. Remember that while the objective is to keep a pulse on anything in the environment (economic, demographic, legislation, political climate, disaster risk) and within the organization that may affect the proxy/data indicator, be mindful to not lose the forest through the trees. For example, be aware of potential global economic crisis, yet do not become consumed with factors that are far removed. The most influential factors to monitor are at the local/regional/state level.

Do not get mired down in the "what if's," but remain aware. Keep your focus on "what is" and your periphery on "what might happen." Stay attuned to the present. Appreciate the past, but do not get stuck there. Always look for an expanded view of what is really trying to happen through your proxy/data indicator. Rise above it and take a look with a fresh pair of glasses. Over time, through the practice of environmental scanning, we become increasingly attuned to the intricacies that shape our revenues.

Assess feasibility of data collection requirements. If data is not readily available, decisions have to be made weighing the cost of making it available against the potential benefits that a given proxy may yield. This is a highly qualitative process and requires making trade-offs between visibility or no visibility to a particular indicator. This is where the artistry of financial condition analysis comes into play. At a minimum, I would suggest the inclusion of Maher & Nollenberger's "Revised 10-Point Test," (partially replicated in Table 1.1), as well as contextual items identified as pivotal to a specific jurisdiction's financial health.

Review Fiscal Environmental Analyses from Similar Jurisdictions

Identify successful practices. The GFOA website includes several examples of actual Long Term Financial Plans from various jurisdictions. They are useful in that they paint the picture of how fiscal environmental scanning and revenue/expenditure projections play in to an overarching long term financial planning. Determine which presentation approach suits you or create one that builds upon the strength of the plans that came before yours.

Design

Conceptual Overview

Summarize what your model will look like. List each proxy that will be used, why it was selected, and what it will measure. Discuss the assumptions and theory that your model is built upon and your basis for the path you have chosen. Provide an overview of the processes and procedures that will be used to scan the environment, calculate proxy items, document results, and the reporting frequency.

Measurement and Revenue Projection Approach

Determine the technical measurement approach that is most suitable to your jurisdiction (e.g., trending, regression analysis). Kavanagh (2007) reports that the way smaller communities and larger communities approach revenue forecasting varies notably. Smaller jurisdictions are more apt to use "judgmental forecasting, historical trending, and hybrid approaches of these techniques instead of regression analyses" (p. 111).

Procedural Approach

Document and flow diagram the data collection and distribution procedures. Identify the data stewards that will be responsible for collecting, storing, and distributing data. In some cases, the data steward may also be the proxy/data specialist. This will depend on whether or not proxy/data specialists maintain their own data. Identify who will be the generating the proxy items and the frequency of calculation.

Presentation Approach

Create mock-ups of how the proxy and revenue projections will appear in the long-term financial plan using the actual proxy items that will be used.

Proxy Calculation Data

Create specifications for each proxy/data item that instruct on exactly how the value was created. This would include source files, disaggregated files, aggregated files and the actual algorithms used to generate the data used to derive the proxy value.

Environmental Driver Data

Specify the environmental data sources that will be monitored in relation to each proxy/data item in the model, as well as proxy/data specialist that will be responsible for scanning the environment.

Reporting, Review, and Management Approval

Determine how results will be reported throughout the year, prior to inclusion in the long term financial plan. Establish a management review and approval process.

Implementation

Establish Revenue Team

Establish a revenue team, comprised of the proxy/data specialists that will routinely meet to share factors expected to affect their data/proxy item with the other specialists.

Establish Implementation Phases

Based on the conceptual and technical design of the model, determine if all the proxy/data items will be implemented in one phase or if they will be transitioned in over

time. This includes when the data will begin being captured or modified to a useable format and when the proxy measure will begin being derived and reported.

Develop and Initiate Project Plan

Develop a project plan that includes all of the above, expanded to the task level with target completion dates and milestones. Identify who will manage the implementation and maintenance of the analytical model for measuring and evaluating financial condition. Identify project team members. Establish roles and responsibilities. Confirm resource commitments.

Monitor Environment and Generate Proxy Values

Proxy/data specialists routinely keep a pulse on the drivers in the external environment that are known to influence their proxy/data indicator. Develop judgmental trends and historical forecasting. Document and present in format designed above.

Test, Feedback, and Refine Model

Record and Plot Actual Values to Projected Values

Each year, track the actual values of each proxy/data item against the model's projected value. Assess the gap between what actually occurred to what was projected. Gauge the success of chosen projection approach (judgmental forecast, historical trend, extrapolated trend projection).

Identify Oversights and Employ Corrective Measures

Rank projections based on their accuracy (most accurate = 1, least accurate = the number of proxy items). Assess the notable discrepancies to determine what was

overlooked in the estimating process that, had it been recognized or included, would have yielded a more accurate projected revenue number.

Fine-Tune as Necessary

Modify causal chains and revenue dictionary to reflect additional causal factors that need to be included in the next year's projection process. Step back and look at the bigger picture. Consider whether basic assumptions used to build the model have changed. Are they still valid?

Chapter 8

CONCLUSION

Summary

Financial condition does not exist in a vacuum. Similarly, effective revenue and expenditure forecasting to support long term financial planning and sustainability necessitate a holistic systems approach that extends beyond the current budget year. All factors inform: economic, demographic, legislative, political climate, and internal management practices. All time periods count: historical, current, and emerging. It is essential that each jurisdiction attune itself to the dynamics and multi-causal relationships that shape its financial indicators, and thereby fiscal health. While environmental data may not "define" local government financial condition from a strict accounting perspective, these external forces, especially for California's counties, largely determine it, and merit consistent monitoring. As always, change remains the ultimate constant. Jurisdictions that maintain a pulse on influential movement in their environment and organization will enhance their ability to shape financial condition instead of be led by it. While Chapter 7 of this document, G*uidelines for Developing a Jurisdiction-Specific Analytical Framework for Assessing the Financial Condition of Local Government,* was developed for the County of Yolo, California, these guidelines apply to all local jurisdictions.

Despite the impediments to measuring and evaluating financial condition, techniques, tools, and methodologies do exist. California's counties face numerous fiscal uncertainties, largely due to their fiscal dependency on the state and the state's

disproportionate revenue dependency on the top 1% of income earners' capital gains revenues (H. Palmer, personal communication, April 26, 2013). In other words, to a considerable degree, the state's fiscal stability varies inordinately with the stock market (T. Gage, personal communication, April 26, 2013). In addition, the electorate has been growing increasingly poorer, less educated, and browner which stands to rearrange the state's service, revenue, and expenditure priorities in future years (K. Ramakrishnan, personal communication, April 26, 2013). Add to that a state legislature that continues to grow increasingly populated with democratic seats, while local representatives, mayors and board of supervisors are growing increasingly republican (T. Kousser, personal communication, April 26, 2013). Although California's budget is on track to remain balanced over the next few budget years, the state has yet to accrue for its future long term financial obligations. These are estimated as high as of $8 billion per year over the next 30 years (T. Campbell, personal communication, April 26, 2013)—or as low as $4.5 billion (M. Taylor, personal communication, April 26, 2013), assuming that local jurisdictions are found legally liable for a portion of the state's unfunded long term liabilities. It is also unknown how the Affordable Health Care Act will affect how California county's existing healthcare services are funded. Additionally, Yolo county's general plan goals of promoting agricultural land, improving open space, developing retail corridors adjacent to I-5, and creating sustainable communities will likewise influence the long term fiscal outlook. While these factors are far from comprehensive, the point is that while many of the dynamics that play a large role in shaping Yolo county's financial health are not going away, their impact can be somewhat mitigated.

The development, implementation, maintenance, and consistent application of an analytical framework makes this possible.

Lack of normative standards, empirical evidence, and the perceived ambiguities regarding the efficacy of the various approaches does not mean that integrating formalized processes and procedures to assess, estimate, and manage local governments' financial future lack benefits. It simply means that turnkey solutions do not exist. The challenge lies in securing the required resources and data necessary to adequately develop, integrate, and consistently maintain an analytical model relevant to a particular jurisdiction's needs. Ideally, these tools would be built into the software of the financial system that they support. Aside from lack of resources, there is every reason to systematically generate indicator analysis ratios and historically trending so that it need not be manually maintained via ad hoc reporting and graphing. Even if measurements cannot be perfected, the routine of monitoring of a representative financial condition framework provides visibility to changing patterns that may require additional analysis and may have otherwise gone unnoticed.

The benefits of allocating dedicated resources to minimize fiscal vulnerability and to increase long term sustainability are invaluable, yet difficult to quantify. How do you measure and justify spending on fiscal environmental analysis, revenue and expenditure forecasting, long term fiscal and service-level solvency when cash and budgetary solvency have sufficed in the public finance culture for over 100 years? Essentially, you need to value the absence of fiscal crisis. Valuing what will not happen because thresholds and controls have been put in place to mitigate unwanted financial patterns

and events, requires adopting a formalized analytical model for measuring and evaluating financial condition. California's local governments do not have to be at the absolute mercy of financial condition, they can contribute to its creation.

After reviewing and analyzing the various approaches for measuring and evaluating financial condition in both the academic and practitioner literature, I am convinced that there is not an absolute right way or wrong way. Every model exhibits varying merits. The more sophisticated regression analysis and simultaneous equations models are compelling, simply because they have the mathematical potential to be extremely robust. That said, automated estimation software produces results proportionate to the theory and assumptions that the model is built upon. The efficacy of any model, automated or not, is primarily dependent on the designer's knowledge of the relationships and interdependencies between enough causal variables and indicators to construct a comprehensive representation of reality. These technical approaches work exceptionally well when the variables and technical specification identified are sufficient to produce a viable representation of reality. As such, it follows that users must also maintain the theoretical statistics background to use bi-variate, regression analysis, and simultaneous equations software packages prudently. The process requires more than simply uploading data and most public finance departments may not employ this expertise. In other words, while the more technically sophisticated models can enhance financial condition measurement and evaluation, they do not guarantee increased accuracy nor do they remove the responsibility of the person interpreting the output. However, until consistent agreement and experiential evidence is available regarding the

series of interdependencies between the vast number of factors that shape financial condition, I suggest using indicator analysis, judgmental forecasting, and historical trending as the primary approach to measuring and evaluating financial condition, as well as projecting revenue and expenditures. Once again, even these less automated approaches still necessitate considerable domain and contextual knowledge.

Automated or not, the integrity of measuring and evaluating financial condition ultimately rests upon awareness and visibility. Public finance professionals must continuously cultivate their understanding of the multi-causal relationships that co-exist between their jurisdiction's environment and its cash, budgetary, long term, and service-level solvency. This practice can manifests the successful design, development, implementation, and ongoing refinement of an analytical framework pivotal to supporting effective long term financial planning and fiscal sustainability.

Suggestions for Additional Research

Case Studies of Actual Local Governments

It would be helpful to do case studies using local governments' environmental, organizational, and financial data. It would be telling to run the numbers through a few of the prominent models for measuring and evaluating financial condition and to qualitatively compare/contrast how effective they are, based on looking at a jurisdiction's fiscal circumstances in hindsight. It would also be interesting to identify which models may have identified rectifiable harbingers that may have been detected using the existing approaches in the literature.

Integrated Presentation of ICMA's FTMS and GFOA's LTFP Model Output

The FTMS system organizes indicators and analysis by data source: environmental, organizational, and financial factors. The LTFP model organizes indicators and analysis by strategic management objective: sufficiency, flexibility, vitality, equity, demand, and political environment. Both approaches provide invaluable views of the aspects of financial condition. In many ways, it is the same data, simply presented differently. Integrating both views into one holistic view that told the whole story from both perspectives would be extremely beneficial.

Simultaneous Equations

The endogenous relationships inherent between financial data, the environmental and organizational factors that largely shape it, and the affect that financial condition imposes on its surrounding environmental factors are textbook candidates for using a simultaneous equations approach to model and predict financial condition. This would require a joint effort of researchers with statistical, public finance, fund and cost accounting, economic, sociology, and political expertise. The relationships may be complex and convoluted, yet they do exist. Finding them is the treasure. Properly modeling them will require an open systems view, experiential knowledge from several disciplines, and collaboration.

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