

A Financial Health Index for Achieving Financial Sustainability

Abstract: This article offers a new approach to measuring organizational financial health based on the financial sustainability model. The objective in introducing these new financial indicators is to enable nonprofits to better manage their financial health and more confidently assure their ongoing financial sustainability. Usable measures of solvency, liquidity, and financial flexibility are introduced. Some of these measures are identical to those already in use, some are adapted from other ratios, and yet others are newly-developed. Actual data from a human services nonprofit organization are used to illustrate calculation of these measures. These measures are also placed in general, immediate-term, short-term, and medium-term classes, category scores calculated, and these category scores are combined into a numerical financial health index value (Φ). C-suite managers and board members may use this single index value to gauge their organization's financial health relative to the next three years of operations. Managers may choose to remedy poor financial health by targeting improvement in individual measures or categories, and may choose to adopt written liquidity, debt, and investments policies consistent with those targets.

The Salvation Army was characterized by management expert Peter Drucker as "by far the most effective organization in the U.S. No one even comes close to it in respect to clarity of mission, ability to innovate, measurable results, deduction and putting money to maximum use" (Lenzner and Ebeling, 1997, p. 97).

One way in which the Salvation Army puts its money to maximum use is by building and maintaining financial health through its savvy targeting of cash reserves. The Salvation Army astutely sets aside targeted funds for operating and capital maintenance and investment reserves; in the most recent year's annual report, the amount so designated by the board of directors is \$1.53 billion, up from the previous year's \$1.43 billion.¹ Its financial policies and the philosophy behind them reveal a well-struck balance between providing human services and

ensuring organizational sustainability. This and other organizations are embracing financial health as a strategic objective, one that enables them to ensure that they will survive and thrive to effectively achieve their missions.

This article highlights the paradigm shift occurring in the nonprofit sector away from the current services model toward the financial sustainability model. Usable measures of three key components of the financial sustainability model – solvency, liquidity, and financial flexibility – are then introduced. Actual data from a human services nonprofit organization are used to illustrate calculation of these measures. Finally, these measures are categorized into general, immediate-term, short-term, and medium-term classes, category scores calculated, and these category scores are combined into a numerical financial health index value (Φ). A nonprofit's managers and board members may use this single index value to gauge their organization's financial health relative to the next three years of operations. The overarching goal in introducing these new financial indicators is to enable nonprofits to better manage their financial health and more confidently assure their ongoing financial sustainability. Decision-makers may use the Φ score, any of the category subscores, or any of the individual measures in strategic planning, financial policy development, or dashboard or scorecard presentation. The underlying premise here is that financial management proficiency enables mission accomplishment. Clear evidence that this premise is taking hold in nonprofits is seen in the paradigm shift underway in administrative offices and in board strategizing and policy-making.

Paradigm Shift: From Current Services Model to Financial Sustainability Model

Keating (2007) indicates that many nonprofits have been caught up in an operating mode she labels the “current services trap.” Under pressure to deliver ever more services today, organizations undercut their sustainability by systematically underinvesting in infrastructure (including staff, systems, and information technology) and in cash reserves. This places the organization at risk regarding its “ability to deliver effective and efficient services in both the present and the future” (Keating, 2007, p. 11). Keating’s characterization of this “current services model” may be paraphrased as follows: By using all available resources to meet urgent, short-term needs, nonprofit organizations undermine their long-term stability and viability. Keating and others (2008) applaud organizations adopting a much-better “financial stewardship” view, in which organizations ensure longevity in reaching toward their missions by attending to liquidity, profitability, and sustainability. Liquidity is adequate if the organization has sufficient cash reserves to both deliver its mission and pay its bills on a timely basis. Profitability is assured if the organization earns revenues that both cover current expenses and allow for appropriate growth with a margin for error. Sustainability is intact when the organization is able to continue operations into the future with a sufficient level of its own resources (Keating and others, 2008, p. 9-10). The ongoing paradigm shift from managing based on a current services model to managing based on a financial sustainability model is supported by new evidence regarding the prudence of nonprofit holdings of what might even

be considered “excess cash” (Ramirez, 2011) as well as new evidence documenting the primary financial objective nonprofit managers are pursuing.

Rationale for New Measures of Financial Sustainability

Survey research and the limits inherent in available financial measures motivate a search for new measures of financial health and sustainability. Financial health has been defined as “the likelihood that the...organization might continue to produce...over time” (Ashley and Faulk, 2010, p. 45).² The organization should not be facing temporary cash crunches or recurrent cash crises in order to be labeled as financially healthy. Bowman develops the concepts of capacity and sustainability into a quantitative model, which views the sustainability principle as requiring “annual surpluses sufficient to maintain asset values at replacement cost over the long term, while also maintaining financial resources available short-term” (Bowman, 2011b, pp. 39-40; see also Bowman, 2011a, p. 2). Similar to Keating and others (above), Bell (2011, p. 10; see also Bell and others, 2010) defines financial sustainability as “the ability to generate resources to meet the needs of the present without compromising the future” However, our survey of research findings and literature resources reveals a gap in proposed measures and in measures-in-use. We shall survey the evidence on the primary financial objective and the literature combined-indicator measures of financial health.

Primary Financial Objective

An empirical study of nonprofit financial decision-making in the early 1990s found that some chief financial officers of donation-based nonprofits appeared to be targeting a range of

cash and near-cash funds as their primary financial objective, and the principal investigator argued that this was a logical and appropriate financial objective (Zietlow, 1997, p. 10; see also Hankin, Seidner, and Zietlow, 1998). A 2011 survey of the chief financial officers (CFOs) of more than 500 nonprofits finds that “nearly two-thirds now strive for sustainability over mere subsistence” (Philanthropy Matters, 2011, p. 3). CFOs at most of these midsize nonprofits, having between \$1 million and \$5 million in revenues, cite “maintaining a targeted level of cash reserves and financial flexibility” (37.6%) or a related objective, “assuring an annual surplus so the mission can be achieved in down years” (26.6%), as their organization’s primary financial objective (Indiana University Center on Philanthropy, 2011, p. 22). Both of these objectives evidence adoption of a financial sustainability model. The objective best fitting the current services model, break even financially, was selected by only 23.7% of the CFOs. The researchers especially note the importance of liquidity and financial flexibility in the study’s conclusions:

This study found that many organizations strive to meet an appropriate liquidity target over time—that is, maintaining a targeted level of cash reserves and financial flexibility and assuring an annual surplus to the mission can be achieved in down years. As organizations deal with fluctuations in their sources of funding, having an understanding of the need for financial flexibility has taken on increased significance, and financially literate managers can help their organizations craft sound strategies and objectives that will keep their organizations not only afloat, but thriving, even during temporary economic declines.

The study did not provide specific financial objectives or measures with which to implement liquidity and financial flexibility concerns. Nor did it provide visibility into how managers and boards might evaluate financial health or determine an appropriate liquidity target.

Liquidity management, broadly speaking, requires measures that address solvency, liquidity, and financial flexibility. Clear definitions of these concepts and how each may be measured are essential for achieving the liquidity and financial flexibility that nonprofits are targeting as they pursue financial sustainability. Scorecards and dashboards should include one or more measures of solvency, liquidity, and financial flexibility.

Solvency is defined as “the degree to which near-term assets exceed near-term liabilities as measured on the balance sheet or the statement of financial position” (Zietlow and Seidner, 2007b, p. 5). The length of time it takes for assets such as uncollected credit sales or pledges to be converted into cash is not part of solvency definitions or its measures. Nor does the solvency concept or its measures incorporate the length of time before cash is paid out for near-term liabilities such as invoices for supplies. Nowhere is the speed of asset conversion to cash or nearness of payables due dates measured in the computation of solvency. Solvency focuses solely on the stock, or stored-up amount, of “current assets” and “current liabilities.” Common measures of solvency include the current ratio and net working capital. However, as noted by Zietlow and Seidner (2007b, p. 5): “If an organization has obsolete and unsaleable inventories and uncollectible pledges or other receivables, most of which are financed by long-term financing (past years’ net revenues, let’s say), it would report a high current ratio and large positive net working capital but very little liquidity.”

Liquidity refers to “having enough financial resources to pay obligations without incurring excessive cost,” and includes “the resources stored up (cash and short-term investments), the resources available from the bank (credit line amounts not already drawn

down), and incoming cash resources (cash revenues in excess of cash expenses in the forthcoming months)” (Zietlow and Seidner, 2007b, p. 5). A very commonly calculated, if limited, liquidity measure is the cash reserve ratio, also called days of cash or months of cash (Zietlow, Hankin, and Seidner, 2007a, p. 214-215). By dividing cash and cash equivalents by daily operating expenses (annual operating expenses divided by 365) or monthly operating expenses (annual operating expenses divided by 12), this financial ratio tells us how many days or months’ worth of operating expenses are covered by cash and cash equivalents. Ideally this number excludes temporarily and permanently restricted cash in the cash and cash equivalent figure, but the breakdown is not always evident in audited financial statements or in IRS Form 990 information reports.

Financial flexibility answers the question, “To what degree can an organization supplement its future cash flows to cover any unforeseen needs or to take advantage of any unforeseen opportunities?”³ An operational definition of financial flexibility is presented in Zietlow and Seidner (2007b, p. 6): “... financial flexibility includes strategic liquidity— the ability to tap liquid funds, including those made available by foundations, grantors, or arranged borrowing, to fund strategic initiatives such as program expansion, geographical expansion, new hires, mergers and acquisitions, social enterprises, and collaborative ventures.” Miller (2003, p. 16) further notes that restrictions placed by donors on an organization’s assets creates what she calls “super-illiquidity,” or a lack of financial flexibility that hampers the operations of the organization.

The distinctions between solvency measures, which have been the primary measures used by managers and board finance committees to date, and liquidity and financial flexibility measures, are important ones. Solvency measures are deficient in that they lack of a time-to-cash perspective. Liquidity measures largely correct for this deficiency, but these measures lack features of financial flexibility such as the amount of an organization's credit line that is not presently being used. Managers and board members would be better served by measures that were split out by time frames (from ability to pay a bill today to the ability to pay bills and meet needs three years from now that are not known with precision today). Put another way, a measure that gauges near-term financial health may not suffice for measuring financial health over a two-year time horizon.

Timeframe-specific financial health measures are needed for at least three reasons. First, financial policy is (or should be) different for operating cash reserves, short-term and medium-term investments, and long-term endowments. Both the risk and cash flow need parameters are different for each of these horizons. Moody's Investors Service evaluates nonprofit healthcare borrowers across three timeframes: monthly, annual, and greater than annual (Moody's, 2010, p. 2). Its studies of organizational cash demands finds that short-term measures are important because of the unpredictability of cash needs linked to natural disasters and market disruptions, while annual/greater-than-annual timeframes mirror large cash demands coming from capital expenditures or pension funding. Second, having measures that stretch beyond the ability to meet immediate or very-near-term cash needs (as would be the case of the oft-cited cash reserve ratio) empowers managers and boards with a forward-looking management focus. Finally, and

perhaps most importantly, organizational vitality and viability may vary across more distant time horizons. Solvency adequacy may be offset by liquidity insufficiency or financial inflexibility. Ideally, multiple-indicator measures would bring multiple time frames and multiple financial dimensions into an overall financial health measure.

Survey of the Literature: Multiple-Indicator Measures

Most of the financial health or sustainability multiple-indicator models focus on the negative dimension of vulnerability rather than positive dimension of financial health. Two notable exceptions are the Composite Financial Index (CFI) used to monitor college and university health and the Bowman “Capacity-Sustainability” Model (2011a, 2011b). As the Bowman Model is a set of four single-indicator measures of short-term and long-term capacity and sustainability, we shall cover it separately.

Financial Vulnerability Indexes. Financial vulnerability measures attempt to assess the likelihood that a nonprofit will experience financial distress or bankruptcy. These measures should be most valuable when the economy is approaching a recession or a major change is about to take place in the organization’s operating environment. Vulnerability studies started with Tuckman and Chang (1991) and include more recent contributions by Greenlee and Trussel (2000), Hager (2001), Trussel (2002), Trussel and Greenlee (2004), Keating and others (2005), and Flatley Lenaghan (2007). These studies use IRS Form 990 report data, an issue we address later. Each vulnerability model in these studies includes at least four separate financial measures (typically ratios) that are combined mathematically into a single, composite number

or score. These important contributions to the literature are only intended to measure the absence of financial health, which might arise from a large, unexpected shock. Tuckman and Chang suggested vulnerability existed if any one or more of four financial ratios calculated for an organization in a given year fell into the bottom quintile (lowest 20%) of its industry's range of values. Later studies employed direct measures of vulnerability such as a 25% or greater reduction in program expenditures or net assets (meaning an organization having a 20% reduction is not considered vulnerable) or the extreme case of organizational death. Of these studies, only the Keating study achieved a high rate of correct classification of relatively distressed organizations (Keating and others, 2005).

We propose a positive approach that managers and boards may use to monitor and manage financial health, sustainability, and robustness. Refocusing nonprofits' attention away from financial vulnerability and toward financial health brings a number of compelling advantages to those stewarding organizations' finances. First, financial management proficiency empowers mission. Strong organizations are better-equipped to achieve missions at a high level. Second, we observe that most organizations are pursuing adequate liquidity as their primary financial objective—a positive construct. Additionally, we know of no evidence that any organization actually uses or benchmarks a vulnerability or distress index value (such as, “we strive to keep our Tuckman-Chang value at a value of 1.5 or below”). Fourth, the existing measures in the literature and in the field of practice do not distinguish between solvency, liquidity, and financial flexibility. We especially highlight the absence of well-developed liquidity and financial flexibility constructs. Illustrating, the vulnerability models

include net assets as a key component, but “If the recession has taught us anything, it’s that net assets are not the same as ‘cash when you need it’”(Miller, 2010, p. 26). Furthermore, there is little discussion of strategic liquidity, which may be necessary two or three years in the future, as it “refers to the ability to seize new strategic opportunities, expand into new services or markets, build infrastructure, or make other large-dollar investments ... [focusing] on liquidity on a longer-term basis, recognizing the possibility of conceivable unexpected, potentially adverse, operating conditions” (Zietlow, 2007, p. 19). Overlooking strategic liquidity results in what many nonprofits experienced in the post-2008 era—the “downturn demonstrated that most colleges and universities underestimated the issue of liquidity in terms of availability or cost” (Tahey and others, 2010, p. 19).

Composite Financial Index. Colleges and universities have available to them the Composite Financial Index (CFI), which brings together four individual ratios, converts them to a strength factor value, multiplies (weights) them based on their relative importance, and adds the weighted values to produce an overall index value of financial health and financial risk (Tahey and others, 2010, p. 133). Weakness in one area, as measured by one of the four ratios, may be offset by strength in one or more of the other areas. The primary reserve ratio (expendable net assets divided by total expenses) measures resource sufficiency and flexibility, the viability ratio (expendable net assets divided by long-term debt) shows ability to manage debt, the return on net assets ratio (change in net assets divided by total assets) gauges asset performance and ability to generate overall return, or surplus, and the net operating revenues ratio (excess (deficiency) of unrestricted operating revenues over unrestricted operating expenses, divided

by total unrestricted operating revenues) reveals an organization's ability to "live within its means" within a one-year time span. The higher the CFI value, the more financially healthy the organization is deemed. A CFI value of 1 indicates "very little financial health", the threshold value of 3 represents a "relatively stronger financial position," and a value of 10 would be the "top score within range" and therefore show a very high degree of financial health (Tahey and others, 2010, 134).

The CFI methodology is very beneficial to decision-makers because it (1) develops a single numerical value (the CFI) for financial health (2) is logical and intuitive in the way in which it combines individual ratio values into this CFI, and (3) allows weakness in one area to be at least partially offset by strength in another area. However, the only ratio that is not a solvency or profitability ratio is the primary reserve ratio, and the expendable net assets component includes too many noncash elements and does not incorporate liquidity elements such as incoming cash or financial flexibility elements such as an unused credit line.

Bowman Capacity-Sustainability Model. Bowman defines his model's intent as having a "primary concern of...overcoming the corrosive effect of inflation on service delivery over the long-term" while acknowledging "short-term resiliency as a precondition for long-term success" (Bowman, 2011a, p. 39). We shall label this model the Bowman Capacity-Sustainability Model and refer to it in this way hereafter. The two financial ratios prescribed for assessing the organization's long-term ability to maintain or expand services are (1) the equity ratio, calculated as equity divided by total assets (equity is the same as net assets, and is calculated as total assets minus total liabilities), and (2) return on assets, calculated as surplus divided by

total assets (surplus being total revenue minus total expense). These two ratios would be characterized as solvency and profitability (or cost coverage) ratios, respectively. Short-term resilience to withstand periodic economic challenges is also gauged through two financial ratios: (1) Operating Reserve Ratio (in months), identical to the measure developed by the Nonprofit Operating Reserve Initiative Workgroup that we discussed earlier, and (2) Mark-Up divided by Total Expenses (Mark-Up is calculated by taking the all revenue except permanently restricted revenue, subtracting all expenses except depreciation). These two ratios would be characterized as liquidity and profitability (or cost coverage) ratios, respectively.

The strengths of Bowman's model are threefold. First, the long-term versus short-term split in the measures and the complementary way in which each of the two ratios mesh in each time horizon are path-breaking. Second, the model forces managerial focus on liquidity by including the operating reserve ratio as one of the two short-term ratios (although the measure used for liquidity is imprecise; see below). Third, the ratios are mapped to the line items on the Form 990 for those organizations reporting to the IRS yearly on this form.

For our purpose of providing a comprehensive view of an organization's financial health from today (immediate needs) through twelve months from today (short-term needs) to three years from today (medium-term needs), the Bowman model will need to be supplemented. First, there is no delineation between very-near-term to medium-term financial health, as the primary concern is long-term capacity. Bowman provides a partial remedy to this issue in a follow-on publication (Bowman, 2011b, p. 89) by adding a "Current Objective" of paying bills to the model, but the added financial ratio overstates the amount of cash and near-

cash assets the organization may use to pay bills and overlooks incoming cash flow from operations as well as unused credit line capacity. Second, with the exception of the operating reserve ratio, which is a crude measure of liquidity, the model relies too heavily on the solvency concept to gauge near-term financial health. The equity ratio tells us what portion of the assets are not financed by debt, but we don't know the terms (maturity or interest rate) of the debt, hence are unclear about the cash flow ramifications of that debt. This is particularly relevant given the existence of tax-exempt bonds and below-market-rate debt in the form of program-related investments or loans from directors. Third, as with the financial vulnerability studies, the model's ratios are calculated from Form 990 data. One issue is the known errors in the Form 990—Bowman notes that a significant number of nonprofits do not report fundraising expenses despite receiving significant donations and cites a study alleging that a significant number of 990s may contain “material omissions, misrepresentations, or falsifications” (Bowman, 2011b, p. 9). Another issue is that religious and small nonprofits do not file a Form 990: one study found that about one-half of nonprofits in the State of Indiana were not even recognized by the IRS (Bowman, 2011b, p. 9). Fourth, unlike those used in the vulnerability models and the CFI, the metrics in Bowman's model are not combined to form a single numerical index.

A New Approach: The Financial Health Index (Φ)

Four ideals motivated and shaped our development of the Financial Health Index (Φ). First, decision-makers should have a framework that captures financial strength in multiple dimensions, but that is synthesized to one index value. The user should be able to succinctly

express organizational health and then point to components that make up that health, as with the CFI.

Second, the index should cover multiple time horizons, as does Bowman's Capacity-Sustainability Model. We take a shorter-term and more liquidity-oriented view than Bowman, premised on the turbulent environment, business model, and funding constraints that nonprofits face. We also broaden the number of indicators to ensure that the index captures solvency, liquidity, and financial flexibility.

Third, the index should capture multiple facets of financial health. Thriving nonprofits are using financial strategies that arise what we call general organizational factors: reputation, size, and the presence of an interested and involved board. We use proxy measures where necessary to integrate these attributes into the mix. The index is comprised of general organizational factors (often gauged by proxy measures), immediate-term measures, short-term measures, and medium-term measures. These are then aggregated into one score, the Financial Health Index, which we report using a shorthand expression, the Greek letter Φ . We contend that inclusion of 15 separate measures, which are rolled up into four subscores (general, immediate-term, short-term, medium-term), allows us to adequately portray solvency, liquidity, and financial flexibility. We selected measures already in use by nonprofits or recommended in the nonprofit literature, developed some new measures by modifying other measures already in use by nonprofits, and developed other new measures by modifying business sector indicators, all the while attempting to include only measures that do not overlap with each other and that measure the aspects and time dimensions identified. We acknowledge

that, compared with financial vulnerability, financial health is much more difficult to measure in way that would be universally agreeable.

Fourth, the index should convey a positive view of organizational finances rather than the vulnerability approach that has largely dominated the literature. We find the philosophy embedded in the CFI and Bowman approaches persuasive, and if “what gets measured gets managed,” believe that our emphasis on health will be functional. We hasten to add that risk is not unimportant, and point out that including measures of financial flexibility indirectly incorporates risk concerns—inflexible means more risky.

Finance officers and staff calculating the component ratios, four subscores (general, immediate-term, short-term, and medium-term), and Φ composite will be able to compare, benchmark, and guide policy with them. This, in turn, will be helpful for relative performance assessment (versus trend and versus aspiration levels, and if peer organizations also compute the measures, peer or industry comparisons). For the growing number of organizations striving to achieve a target liquidity level, the degree of health can serve as the essential input into setting or resetting that level. Specific ways in which that target level may be measured may be referenced in Appendix A. We now introduce the proposed methodology and illustrate its application to an actual human services nonprofit.

Calculating and Interpreting the Financial Health Index

The Financial Health Index (FHI, denoted ϕ) is a single-index indicator of overall financial health for the timeframe spanning from tomorrow to three years from now. The index

is calculated by weighting four categories of indicators. Fifteen individual indicators are included in the categories. While we did not start developing the index with a pre-specified number of indicators, each of the indicators adds a unique contribution to financial health. We note that the recently-developed Z-Metrics creditworthiness index for businesses includes thirteen indicators (Altman and Rijken, 2011). Here is the financial health index stated as a formula:

$$\phi = (0.10 \times \text{General Subscore}) + (0.40 \times \text{Immediate-Term Subscore}) + (0.30 \times \text{Short-Term Subscore}) + (0.20 \times \text{Medium-Term Subscore}) \quad (1)$$

The index is broken down into fifteen separate indicators as follows: three “General Indicators,” four “Immediate-Term Indicators,” three “Short-Term Indicators,” and five “Medium-Term Indicators.” The index is calculated in three steps: (1) Calculate each of the three to five indicators within the category, (2) calculate the category subscore, and (3) add up or otherwise weight the general, immediate-term, short-term, and medium-term subscores to arrive at the index value. The simplest way to score the overall ϕ index is to cap it at a maximum value of 100, summarized as “exceptionally financially healthy.” Each of the categories may then be capped at the product of its weight and 100: the General subscore would be capped at 10, Immediate-Term at 40, Short-Term at 30, and Medium-Term at 20. In this way, if an organization achieved top scores in every single category (most unlikely), its ϕ index would be 100. Within each category, the simplest method of assigning relative weights to the indicators is to equally weight them. We shall briefly explain the categories and then use them to assess a nonprofit’s financial health.

General

Age and *size* serve as two proxies for reputational capital and a related ability to quickly fundraise, tap operating grants, or tap bank loans on relatively short notice. Reputation provides financial flexibility because donors give largely based on reputation (and might be counted upon to provide funds if urgently needed or if an attractive investment opportunity arises) and it is an important component of risk (Eccles and others, 2007). *Age* measures longevity of the organization, and reputation may be seen as superior or the organization more trustworthy to donors (Okten and Weisbrod, 2000; Szper and Prakash, 2011) and to grantors, as they view it as a proxy for organizational quality (Weisbrod and Dominguez, 1986). *Size* serves as a proxy measure for access to capital markets and for the level of information asymmetry (unobservability for outsiders)—both of which suggest larger organizations have less financial risk and more financial flexibility. Chen (2009) summarizes previous studies as demonstrating a “predominant positive relationship” between size and the amount of public support, which his research also documents. Chen attributes this to the fact that larger organizations have more maturity and name recognition. Szper and Prakash (2011) posit that size may be associated with primary revenue expansion in future years due to higher name recognition and greater fundraising capacity—particularly if the organization has a national or international scope. Larger and more mature organizations are assigned a higher “General” subscore.

Growth can be a positive for organizational financial health due to the achievement of economies of scale and build-up over time of favorable reputation effects. Both positive effects are incorporated by the other two components in the General category, age and size. However,

growth also requires infrastructural and employee investments, and unstable growth is both an effect and a cause of difficulties. (Smith, 2010). We therefore include a measure of *instability* around trend growth, ⁴ with a higher numerical value being reflective of greater instability. A higher value would reduce the “General” subscore for the organization. Table 1 includes the three measures we include in the General category, how each of these is calculated, and a formula showing how the General subscore is calculated. We allow the user to specify the weights to use in attributing either more or less importance to each of the three measures in building to the subscore, with the default setting being equal weights. Multiply the indicator’s value by its weighting value (1/3 if using equal weighting), repeat the process for each indicator, then add the three weighted products up to arrive at the General subscore.

Insert Table 1 about here.

Immediate-Term

The second category of indicators portrays the organization’s financial health relative to expected and unexpected cash inflow and cash outflow events from tomorrow to three months from now. Solvency measures are only helpful in this timeframe if they center on cash and short-term investments that may be sold and converted into cash within a few days. The focus is necessarily on cash flow and liquidity measures. Consult Table 1 for calculation detail for these four measures.

We use one measure of unrestricted cash relative to cash expenses—an improvement on the cash reserve ratio that is often advocated for nonprofits. We refer to this measure as the

“cash reserve sufficiency ratio.” We use several of the adjustments to expenses as presented by Barr (2008) in arriving at cash expenses—Barr also subtracts pass-through funds and unusual, one-time expenses. We wish to anchor this value at 1 if the organization has achieved the common benchmark of 3 months’ of cash expenses, which we accomplish by making two adjustments (refer to Table 1 for the detailed formula). Higher values for the cash reserve sufficiency ratio measure imply better financial health.

We look next at a conservative measure of the “liquidity” of total assets by computing what we call “net cash” as a proportion of total assets. This measure we term the “modified cash ratio.” Illiquid organizations may prop up cash by stretching payables and accruing more expenses, so we net these out of the amount of unrestricted cash. Higher values for the modified cash ratio measure imply better financial health.

Our third measure of near-term bill paying ability, taken from an adapted ratio in Zietlow, Hankin and Seidner (2007a; Emery and Cogger, 1998), is more involved. It augments unrestricted cash with other readily accessible sources of cash: unrestricted short-term investments (typically they can be sold and cash received within one to three business days), the unused portion of the organization’s credit line (if it has a line), and the next year’s projected operating cash flow (as would be shown on the Statement of Cash Flows). As there may not be a solid projection of upcoming operating cash, we use as a proxy measure the average of the past three (or, better, five or seven) years of operating cash flows. Once all four of these potential sources of cash (cash, short-term investments, unused short-term credit, and incoming operating cash) are summed, we divide the sources by the uncertainty of operating cash flows.

This accomplishes four things: (1) it enables one to compare liquid resources with the degree of variability of operating cash, and (2) it prevents the organization from receiving poor health scores simply because it does not choose to maintain all or most of its liquidity in cash or short-term investments, (3) it recognizes that an organization may rely on incoming cash flow to stay liquid (consider at the extreme Microsoft, which generates a \$1.5 billion operating cash flow per month so needs to store little in cash or investments), and (4) it gives higher health scores to an organization with very steady operating cash flows, all other things equal. Higher values for the target liquidity lambda measure imply better financial health.

The final immediate-term indicator is the current liquidity index (Zietlow, Hankin, and Seidner, 2007a; Maness and Zietlow, 2005), allows us to ensure that fixed, financing-related cash outflows are adequately covered by unrestricted and temporarily-restricted cash and unrestricted and temporarily-restricted short-term investments. Some organizations solicit and receive donations that are donor-restricted specifically for debt paydown; furthermore, the entirety of temporarily-restricted cash and short-term investments may become available this year to meet some other obligations, which is why we include temporarily-restricted cash and short-term investments as part of the resources available. The financial obligations in view are short-term notes payable and the portion of long-term debt that must be paid off within one year (“current portion of long-term debt”). Higher values for the current liquidity index imply better financial health.

We then arrive at the immediate-term subscore by a two-step process: (1) for each indicator, take the indicator value and multiplied it by the weight assigned for that ratio (with

the default setting being a weight of $\frac{1}{4}$ or 0.25, since there are four indicators), and (2) sum the weighted ratio values of the four indicators.

Short-Term

Organizations having financial resources adequate to maintain their financial health from three to twelve months in the future are characterized by strong cash flow coverage of near-term liabilities, a relatively liquid asset mix, and the financial flexibility to reduce their expenditures within six to twelve months. Refer to Table 1 for calculation detail for these three measures.

Cash flow coverage of near-term liabilities comes through generating cash flow sufficient to more than pay off near-term liabilities (Zietlow, Hankin, and Seidner, 2007a; Mills and Yamamura, 1998). The operating cash flow ratio indicates how many times over the current liabilities could be covered by the flow of cash during a one-year period. Higher coverage denotes more of a cushion, and hence greater financial health.

The asset ratio reveals the proportion of an organization's total assets that are in a relatively liquid form (Robinson, 1988; Zietlow, Hankin and Seidner, 2007a). This ratio is a solvency measure, so all of the cautions we cite regarding such measures are relevant here. For this reason, we do not include the ratio in our immediate term category, but it fits more appropriately in the short-term category. Organizations with more of their asset investment in items that should turn into cash within a year possess greater financial health than those

investments are tied in illiquid plant and equipment (much like a “house poor” consumer). Higher values of this ratio show more financial health for this reason.

Financial slack may also come in the form of expenditures that may be reduced if necessary to preserve the organization’s financial health and vitality (Bowman, Keating, and Hager, 2006; we acknowledge that programs may suffer for a period in this event). The administrative expense ratio, by expressing administrative expenses to total expenses excluding administrative expenses, measures the organization’s ability to manage expenses through layoffs, furloughs, unpaid leaves, quits without replacements, and retirements. This “sweat equity” drawdown allows time for the management and board to take other revenue-enhancing or expense-reducing steps to correct fiscal imbalances. Higher values of this ratio indicate more financial health.

Follow the same two-step procedure used for the other subscores to determine the short-term subscore (with the default setting now being a weight of 1/3 or 0.33, since there are three indicators).

Medium-Term

Our final five individual financial health metrics are calibrated to indicate financial health in reference to the period from twelve to thirty-six months (1-3 years from now). Here, relevant measures are the ability to generate surpluses, the dependence on the most risky source of revenues and support (contributions), the ability for the organization to self-finance its growth, the degree of arranged financing in the organization’s capital structure, and the

“expensiveness” of fundraising. Refer to Table 1 for the calculation detail for these five measures.

We define surplus as the change in net assets (Robinson, 1988). This incorporates all changes to the net assets, or “equity,” of the organization in a year’s time. Organizations can only continue to survive and thrive if they generate surpluses on a fairly consistent basis. We award a higher value to this measure for larger surpluses, in that (once adjusted for non-cash items) this should increase cash in the medium-term horizon.

The contribution ratio compares total contributed income and support to an adjusted total revenue and support figure. The latter is adjusted for any unrealized or realized changes in real estate and long-term investment values to give a clearer and more accurate measure of relevant revenues and support. Numerous studies have found that donative organizations (or those characterized by a high “collectiveness index”), those with a greater percentage of revenues and support coming from donations, have a less predictable stream of resources with which to cover expenses and other necessary expenditures. We therefore accord greater financial health to organizations with lower proportions of contributed income and support. However, in accordance with revenue diversification studies (see the literature review and findings in Fischer, Wilsker, and Young, 2011), we score more highly organizations that have a small percentage of contributed income and support relative to those that have none.

Self-financing growth is a phenomenon that is underreported in the literature but oft-observed in practice. Many nonprofits rely heavily on surpluses, many times enhanced by

capital campaigns, to fund capital expenditures. We take the last three years of operating cash flows, determine if it is positive, then divide that by the last three years of investment cash flows, assuming they are negative. We then take the absolute value of that ratio to indicate the degree of self-financing. For example, an organization with \$50, \$75, and \$175 in operating cash flows (sum of \$300) that had investing cash flows of \$15, -\$75, and -\$275 (sum of -\$335) would have a self-financing ratio of $|300 / -335|$ or 0.896. This means that, whether intentional or not, the organization self-financed 89.6% of its investments over the past three years. Greater degrees of self-financing imply financial health both because this reflects a lesser use of debt and also because it indicates a healthy business model. The caution to be aware of here is to adjust investing cash flows for any significant financial investment purchases or sales that might be in the investing cash flow numbers (usually these are zero, insignificant, or offsetting within the three-year period).

The use of debt is risky for nonprofits due to their inability to issue common or preferred stock and due to the cash flow ramifications: interest payments for a number of periods, followed by a significant principal repayment. We adopt Smith's (2010) measure of the financial debt ratio. Higher degrees of debt in the capital structure are indicated by taking financial (arranged) debt and dividing it by the sum of financial debt and total net assets. Higher values accord with poorer financial health.

Finally, the fundraising cost ratio compares fundraising expenses to total contributed income and support (Trussel and Parsons, 2008). Higher ratios come with younger organizations, lapsing donor bases, reputational problems, many small gifts, inefficient or

ineffective development programs, and other causes. Generally, higher values imply less financial health, partly due to the higher expense structure and partly due to the increasing possibility of donor reaction (helped along by charity watchdog reporting, although the evidence is mixed on how much of an effect the reports have).

Follow the same two-step procedure used for the other subscores to determine the medium-term subscore (with the default setting now being a weight of 1/3 or 0.33, since there are three indicators).

With the fifteen financial measures, we have a comprehensive and multifaceted view of the financial health of a nonprofit organization. Table 2 provides a mapping regarding (1) which category the measure belongs to, (2) as the measure's value increases, what would we expect to happen to organizational financial health ("expected sign" column), and (3) the dimension that the measure is capturing, whether solvency, liquidity, or financial flexibility. The "expected sign" column will be our guide as we interpret trend changes in the individual indicators' values. We now demonstrate the results of applying these measures to an actual nonprofit organization.

Insert Table 2 about here.

Applying the Financial Health Index

We demonstrate the calculations for the fifteen individual financial health indicators in Table 3. Space limitations preclude showing the financial statement locations, numerator, and

denominator for each indicator; please reference Table 1 for this detail. Table 3 provides the indicator, the type of indicator (solvency, liquidity, financial flexibility), and the calculated values for the three most recent years for a human services nonprofit.⁵ In the rightmost column, “Interpretation of Trend,” we have included an explanation regarding how we would interpret each indicator. Two years of data might be minimally acceptable for showing one year-over-year change, but ideally we would have three or more years of calculated values for each indicator to more confidently establish the trend. The organization profiled, Refuge of Hope (www.refugeofhope.org), is a faith-based human services organization in medium-sized Midwestern city that was founded in 2001. Refuge of Hope provides six meals a week to needy individuals and families—the most of any nonprofit social service agency in its county--and also houses a 34-bed emergency shelter for men. Total meals served has spiked up from 14,500 in 2008 to 46,331 in 2011, with a projected total of 60,000 meals to be served in 2012. The shelter has been at or near its capacity each night from 2008-2011, with growth from 8,800 bedded nights in 2008 to 12,223 in 2011 (Refuge of Hope, n.d.).

Insert Table 3 about here.

General

The General category is made up of three indicators (see Table 3), and the General subscore is calculated as the weighted values of these indicators. Note that the organization shows an increase in financial health related to becoming more mature (moves from 2.08 to 2.30) and growing its revenues and support (jumps from 12.87 to 13.57). The asset instability index,

however, increases slightly in value over the three-year period, representing a slightly more risky financial profile. The large numbers for this index are not as concerning as they appear to be: If assets move from \$665,000 to \$685,000 to \$675,000 over the three years (which we would argue is fairly stable), the asset instability index would turn out to be 7,071. Growth, by itself, does not trigger high index values: if assets move over three years from \$665,000 to \$950,000 to \$1,200,000, the index value turns out to be 8,250. However, an unstable asset trajectory of \$665,000, \$250,000, and \$1,200,000 yields an index value of 321,734. The weight, or multiplier, that one should use when entering the asset instability index into the General subscore would necessarily be rather small and negative, since larger values of the index connote lack of financial strength.

Illustrating the General subscore calculation, we select multipliers (weights) of 1.25, 0.33, and -0.00001 for our age, size, and asset instability index, respectively. The underlying idea for selecting weights is to determine what numerical value of the individual measure should merit a top score for the indicator (with 10 being a top score in the General category, since this category carries a 0.10 weighting in the overall financial health index, and the overall index maximum value is 100). One would then divide this value into 10 and multiply by 0.33 (when there are three indicators in the General category, and when higher values of all three of the indicators signal greater financial health). To underweight or overweight an indicator, one could then multiply the resultant weighted score by a number greater than 1 (to overweight it) or less than 1 (to underweight it). With our weights, the General subscore values for 2009, 2010

and 2011 then become (rounding weighted products at three decimal places and subscore at two decimal places):

$$\begin{aligned}\text{General subscore}_{2009} &= (1.25 \times 2.08) + (0.33 \times 12.87) + (-0.00001 \times 19,965) \\ &= 2.600 + 4.247 + - 0.200 \\ &= \underline{6.65}\end{aligned}$$

$$\begin{aligned}\text{General subscore}_{2010} &= (1.25 \times 2.20) + (0.33 \times 13.54) + (-0.00001 \times 50,019) \\ &= 2.750 + 4.468 + - 0.500 \\ &= \underline{6.72}\end{aligned}$$

$$\begin{aligned}\text{General subscore}_{2011} &= (1.25 \times 2.30) + (0.33 \times 13.57) + (-0.00001 \times 20,742) \\ &= 2.875 + 4.478 + - 0.207 \\ &= \underline{7.15}\end{aligned}$$

If the value turns out to be greater than 10, we would round down to a value of 10 since that represents the maximum value for the General subscore. We see in our sample organization's case that the General subscore increased from 6.65 to 6.72 to 7.15, or by about 7.5% over the three years, indicating a fairly small increase in the organization's financial health. The smaller-than-expected increase in the subscore in 2010 results from the greater asset instability index in that year, which links to the fact that much of the renovation to the new facility was done during that fiscal year.

Immediate-Term

The Immediate-Term subscore is the sum of the weighted values of four indicators (see Table 3). Here the news is slightly negative for our sample organization: two of the three of the indicators for which the organization has activity are showing a negative trend (see Table 3). Financial health at first improved due to higher cash coverage of cash expenses in the first two years, but that reversed as this indicator's value dropped back to a level very close to its beginning level (1.06 in 2009, 1.35 in 2010, 1.08 in 2011). Financial health improved as the organization built its financial resources relative to cash flow variability (1.96 increases to 3.32, then settles at 2.66). However, financial health deteriorated because of slightly less net cash as a percent of assets (0.12 in 2009, 0.21 in 2010, and 0.08 in 2011). Furthermore, as of the beginning of the three fiscal years, the organization does not have any of the fixed financial obligations coming due within the year, making the current liquidity index "not applicable" due to a division by zero (but it would be very high even if the organization had a small dollar amount of such obligations). However, looking ahead to the next fiscal year (2012), the new long-term debt incurred by the organization implies that the current liquidity index will become a factor in next year's Intermediate-Term measure.

Illustrating the Immediate-Term subscore calculation, we select weights of 1.25, 12.5, 0.85, and 0.50 for our cash reserve sufficiency ratio, modified cash ratio, target liquidity lambda, and current liquidity index, respectively. We shall assume the overall category weight is 0.10 in the financial health index to keep the numbers consistent with our General subscore. Note that the current liquidity index is not applicable ("NA") because there are no short-term credit line or bond repayments due within the next year for any of our three years. We do not give a

numerical score to the organization because we do not know if the organization is creditworthy enough to qualify for these types of borrowing; an alternative treatment would be to reweight the remaining three variables more heavily to compensate for only using three of the four component measures for this subscore. With our weights, the Immediate-Term subscore values for 2009, 2010 and 2011 then become (rounding weighted products at three decimal places and subscore at two decimal places):

$$\begin{aligned}\text{Immediate-Term subscore}_{2009} &= (1.25 \times 1.06) + (12.5 \times 0.12) + (0.85 \times 1.96) + (0.50 \times \text{"NA"}) \\ &= 1.325 + 1.500 + 1.666 + \text{"NA"} \\ &= \underline{4.49}\end{aligned}$$

$$\begin{aligned}\text{Immediate-Term subscore}_{2010} &= (1.25 \times 1.35) + (12.5 \times 0.21) + (0.85 \times 3.32) + (0.50 \times \text{"NA"}) \\ &= 1.688 + 2.625 + 2.822 + \text{"NA"} \\ &= \underline{7.14}\end{aligned}$$

$$\begin{aligned}\text{Immediate-Term subscore}_{2011} &= (1.25 \times 1.08) + (12.5 \times 0.08) + (0.85 \times 2.66) + (0.50 \times \text{"NA"}) \\ &= 1.350 + 1.000 + 2.261 + \text{"NA"} \\ &= \underline{4.61}\end{aligned}$$

We see in our sample organization's case that the Immediate-Term subscore increased by a mere 2.67% over the three years, from 4.49 to 4.61, indicating a negligible increase in this component of financial health. The "NA" value for the current liquidity index did not significantly impact the subscore. One could substitute the "industry average" value for this missing measure when calculating the subscore, but we would caution that this may overstate

financial health—we do not know if the organization has no credit line balance or principal repayments coming because it is self-financing growth or because it has been closed out of the credit markets. One could also ignore the missing value and “re-weight” the subscore calculation to account for the fact that there are only three indicators in this case, rather than four. Finally, since the subscore was based on an ideal score of 10, but the Immediate-Term subscore counts for 40% of the ϕ measure, we shall later multiply the above subscores by 4 when arriving at ϕ , which has a maximal value of 100.

Short-Term

All three short-term indicators signal deteriorating financial health, with two of the three measures dropping substantially (see Table 3). The operating cash flow ratio first rose then fell substantially (2.87 to 10.75 to 2.06) as did the asset ratio, which plummeted by almost 57% (0.30, 0.34, then 0.13). However, due partly to the organization’s growth and attendant increase in operating efficiency, the administrative expense ratio drops slightly from 0.17 to 0.12 to a final value of 0.16. A smaller percent of total expenses going to administration leaves slightly less “fat from which to cut” for any cuts that the organization might be pressed into making should its financial position deteriorate in an upcoming year. The short-term trend is greatly concerning with its downward spiral toward worsening financial health.

Illustrating the Short-Term subscore calculation, we select weights of 0.75, 6.60, and 8.33 for our operating cash flow ratio, asset ratio, and administrative expense ratio, respectively. We shall again assume the overall category weight is 0.10 in the overall financial health index to

keep the numbers consistent with our General subscore. With these weights, the Short-Term subscore values for 2009, 2010 and 2011 then become (rounding weighted products at three decimal places and subscore at two decimal places):

$$\begin{aligned}\text{Short-Term subscore}_{2009} &= (0.75 \times 2.87) + (6.60 \times 0.30) + (8.33 \times 0.17) \\ &= 2.153 + 1.980 + 1.416 \\ &= \underline{5.55}\end{aligned}$$

$$\begin{aligned}\text{Short-Term subscore}_{2010} &= (0.75 \times 10.75) + (6.60 \times 0.34) + (8.33 \times 0.12) \\ &= 8.063 + 2.244 + 1.000 \\ &= \underline{11.31}, \text{ but since this is greater than 10, round down to } \underline{10.00}\end{aligned}$$

$$\begin{aligned}\text{Short-Term subscore}_{2011} &= (0.75 \times 2.06) + (6.60 \times 0.13) + (8.33 \times 0.16) \\ &= 1.545 + 0.858 + 1.333 \\ &= \underline{3.74}\end{aligned}$$

We see in our sample organization's case that the Short-Term subscore dropped by almost 33% over the three years (5.55 to 3.74), indicating a very substantial erosion in this component of financial health. Since the subscore was based on an ideal score of 10, but the Short-Term subscore counts for 30% of the ϕ measure, we shall multiply the above subscore by 3 when arriving at ϕ .

Medium-Term

The five medium-term measures, with the exception of the financial debt ratio, are mostly positive developments: the net surplus explodes from \$13,258 to \$211,801 and settles at \$85,229, the contribution ratio drops from 73% to 57% before ending at 60%, and the self-financing ratio doubles in value before declining significantly due to the completion of a major building project (Table 3). The financial debt ratio does increase from 0% in the first two years to 16% in the final year, linked to arranged long-term financing that covers about 30% of the amount needed for the new building. The fundraising cost ratio is concerning in that it jumped from 15% to 25% in the first two years; however, bear in mind that the surplus increased markedly, and it may well be that this organization (like many of its peers) has underinvested in fundraising in the past. The organization was also in the midst of a building program, which tempers our concern a bit. And, that ratio declines nicely to 12% in the final year. Unfortunately, donors do not always diagnose the reason for increases in fundraising ratios, and once higher these ratio values may persist at the higher levels, which is why we must view any increases as partly offsetting the financial health increases from the other indicators.

Illustrating the Medium-Term subscore calculation, we select weights of 0.00001, -2.00, +2.00, -2.00, and -2.00 for our net surplus, contribution ratio, self-financing ratio, financial debt ratio, and fundraising cost ratio, respectively. Two comments are germane here: (1) one would want to base the weight for net surplus on what percent that surplus (or deficit) represents as a percent of either total revenue & support or of total expenses; and (2) if the contribution ratio is low and positive (say, between 0.05 and 0.30), one might wish to override the negative weight value and instead use a small positive weight value of perhaps 2.0. We shall again assume the

overall category weight is 0.10 in the financial health index to keep the numbers consistent with our General subscore. With these weights, the Medium-Term subscore values for 2009, 2010 and 2011 then become (rounding weighted products at three decimal places and subscore at two decimal places):

$$\begin{aligned}
 \text{Medium-Term subscore}_{2009} &= (0.00001 \times 13,258) + (-2.00 \times 0.75) + (2.00 \times 1.04) + (-2.00 \times 0.00) \\
 &\quad + (-2.00 \times 0.15) \\
 &= 0.133 + -1.500 + 2.080 + 0 + -0.300 \\
 &= \underline{0.41}
 \end{aligned}$$

$$\begin{aligned}
 \text{Medium-Term subscore}_{2010} &= (0.00001 \times 211,801) + (-2.00 \times 0.57) + (2.00 \times 2.00) + (-2.00 \times 0.00) \\
 &\quad + (-2.00 \times 0.25) \\
 &= 2.118 + -1.140 + 4.000 + 0 + -0.5000 \\
 &= \underline{4.48}
 \end{aligned}$$

$$\begin{aligned}
 \text{Medium-Term subscore}_{2011} &= (0.00001 \times 85,229) + (-2.00 \times 0.60) + (2.00 \times 0.62) + (-2.00 \times 0.16) \\
 &\quad + (-2.00 \times 0.12) \\
 &= 0.852 + -1.200 + 1.240 + -0.320 + -0.240 \\
 &= \underline{0.332}
 \end{aligned}$$

We see in our sample organization's case that the Medium-Term subscore decreased by almost 2% over the three years, indicating a slight decrease in this component of financial health. As with our Immediate-Term and Short-Term subscores, the organization achieved a significant increase from 2009 to 2010, followed by an even more significant drop-off from 2010 to 2011.

The organization built liquidity, solvency, and financial flexibility in advance of its completion and move-in to its new building in the middle of 2011, but has been unable to restore 2009 levels as of the end of the 2011 fiscal year. Since the subscore was based on an ideal score of 10, but the Medium-Term subscore counts for 20% of the ϕ measure, we shall multiply the above subscores by 2 when arriving at ϕ .

Overall Financial Health

The fifteen indicators paint a moderately discouraging picture of financial health for our sample organization. Management and the board may wish to revisit the individual ratios that affected financial health adversely, and attempt to project the future values for these indicators to see if the changes will likely persist. Scrutiny of the four subscores should also bring insight. It yet remains possible that a few positive indicators (such as those in the General category) might outweigh the negative trends in some of the other measures. Calculating the overall financial health ϕ for 2009, 2010 and 2011 for our sample organization gives us a glimpse into the overall picture of the organization's financial health and sustainability. Our overall index, as presented earlier in Equation 1, is:

$$\phi = (0.10 \times \text{General Subscore}) + (0.40 \times \text{Immediate-Term Subscore}) + (0.30 \times \text{Short-Term Subscore}) + (0.20 \times \text{Medium-Term Subscore})$$

Since we calculated each subscore as if it was based on a 0.10 weighting (or had a maximum value of 10), we will adjust the calculated subscores by reweighting them to their

appropriate financial health index weights. We demonstrate the overall financial health index computations for 2009-2011 below:

$$\Phi_{2009} = (\text{General Subscore}) + (4 \times \text{Immediate-Term Subscore}) + (3 \times \text{Short-Term Subscore}) + (2 \times \text{Medium-Term Subscore})$$

Substituting the calculated values for the 2009 subscores from above:

$$\Phi_{2009} = (6.65) + (4 \times 4.49) + (3 \times 5.55) + (2 \times 0.41)$$

$$\Phi_{2009} = (6.65) + (17.96) + (16.65) + (0.82)$$

$$\Phi_{2009} = \underline{42.08}$$

Substituting the calculated values for the 2010 subscores from above:

$$\Phi_{2010} = (6.72) + (4 \times 7.14) + (3 \times 11.31) + (2 \times 4.48)$$

$$\Phi_{2010} = (6.72) + (28.56) + (33.93) + (8.96)$$

$$\Phi_{2010} = \underline{78.17}$$

Substituting the calculated values for the 2011 subscores from above:

$$\Phi_{2011} = (7.15) + (4 \times 4.61) + (3 \times 3.74) + (2 \times 0.33)$$

$$\Phi_{2011} = (7.15) + (18.44) + (11.22) + (0.66)$$

$$\Phi_{2011} = \underline{37.47}$$

Our sample organization has achieved a very commendable increase in its overall financial health from 2009 to 2010, as reflected in an 86% increase in its ϕ value, and a significant ascent toward the top theoretical score of 100. However, completion of the building project drained significant financial resources, resulting in a 53% drop from 2010 to 2011 and an overall 2009-2011 decline in financial health of 11%. The question remains: Is this a significant decline? For relative values, we use 10% as a threshold for assessing the significance of change; on this basis, we would characterize the 2009-2011 Φ erosion of -11% as a significant erosion. We further point to the absolute level of the organization's Φ scores: the maximum value is 100, and we see 2009-2011 yearly index scores of 41.56, 77.62, and 36.89, respectively. Other exploratory work we have done with a broad cross-section of faith-based nonprofits (using a slightly different model) indicates that very few organizations score above 80 on the financial health index, but a score of 36.89 is quite low and concerning to us. Again, on this basis, we would urge the board and management of Refuge of Hope to begin addressing the causes of its decline in financial health and rebuilding its financial strength.

The organization's management team and board may wish to study how and why this increase was achieved to draw general lessons on its improvement (by revisiting the subscores and individual measures), and also consider if it wishes to revisit its liquidity target for further refinements (this organization has a near-term goal of achieving a 1.5-month operating reserve and a longer-term goal of achieving a three-month operating reserve).

We suggest these five general uses for the overall financial health index: (1) monitoring the organization's financial health, especially noting significant drops in the index and its

subscores; (2) policy-setting, especially in (a) revising the organization's target liquidity, since weakness in any of these subscores or the overall ϕ value might make a case for a larger target liquidity level (or explicit targeting of approximate liquidity target if this is not presently being done), with sensitivity analysis using varying levels of the target liquidity level to reach an aspirational goal or benchmark value for Φ ; (b) establishment or reset of the organization's bank credit line amount; and (c) limiting additional arranged debt (especially short-term loans or credit line draws that have no known repayment source) if any subscore unveils significant weakness; (3) determining and assessing financial strategies; (4) determining and assessing operating strategies; and (5) benchmarking financial health and sustainability with peer organizations.

Mitigating Factors and Limits

Several cautions need to be mentioned regarding the use of the selected financial measures and the financial health index. First, by design the scope of the health measure only extends out to three years, so it is incumbent on the board, CFO, and ED/CEO to ensure long-range financial planning is being done and that any feedforward between financial health now and down-the-road issues be addressed. One can envision a projected liquidity target for the three-year window ("liquidity target will be \$750,000 as of three years from now) that gets preserved and possibly modified as long-term strategies and plans are implemented. Also, a longer-term framework such as Bowman's model may be used in conjunction with the index.

Second, the data used in the model is taken from financial reports compiled according to Generally Accepted Accounting Principles (GAAP) as stated in the Accounting Standards Codification (ASC). The data is not taken from Form 990 reports because of the lesser reliability of the data, the lack of cash flow data, and less standardization used in arriving at numerical values. Additionally, as noted earlier, 990s are fraught with errors and inconsistencies and they are not available for many small organizations or faith-based organizations. External analysts not using 990s will find this limiting in cases for which they can access the 990s but may not have access to GAAP financials, as they will not have the cash flow data needed for some of the index's indicators (Flatley Lenaghan, 1997). However, internal users—management and board members—can and should have most of this data.

Using compiled, reviewed, or audited financials is limiting for other reasons. First, greater assurance that financials are fairly reported in accordance with GAAP only comes with audited financials, but many nonprofits generating less than \$1 million in annual revenue have compilations or reviews rather than audits. Second, there are judgment calls on the accounting estimates used for some financial statement data. Third, the Φ components' data requirements may not be met if one only has a condensed statement of activities or statement of financial position available. For example, depreciation expense may not be shown, and the analyst may have to get that number from the statement of cash flows. Fourth, some data substitution judgment calls may be necessary. For example, in our sample calculations (Table 3), the current liquidity index value could not be computed. This forces a decision on excluding that measure or a reweighting of the immediate-term subscore to weight three ratios rather than four (not

done here). Other times an indicator's numerical value might appear unwarranted, particularly if one uses analyst-supplied values for the operating cash flow forecast or if recession-induced effects on changes in net assets are very large due to declining real estate or security values. We recommend that "out-of-bounds" or nonsensical ratio values be treated as outliers and trimmed from the index score calculation. In the medium-term category, if an organization has no arranged financial debt, judgment might call for replacement of that indicator with another one that would be relevant for this timeframe, such as cash conversion efficiency (operating cash flow divided by revenues and support; see Maness and Zietlow, 2005). Fifth, to carefully evaluate an organization's trend, one should prefer five years of data. The minimal need is three years of data for some of the calculations (as were used to determine several of the indicators in our sample calculations), and one may not have three years of compiled/reviewed/audited financials available. Sixth, we note that the user may overstate some measures due to not having a break-out of unrestricted cash. Organizations are beginning to disclose more detail on the restrictions of asset items, but this is not strictly required by GAAP except for some items such as permanently restricted cash that is held as part of a donated (as opposed to board-designated) endowment. Finally, we expect that full and effective use of these indicators, subscores, and the financial health index would be easily grasped by CFOs and most board treasurers, but would require board and ED/CEO orientation/training. We believe the advantages of using standardized financial statements that are typically reviewed by external, trained accountants working for public accounting firms outweigh the limitations we have noted.

Further Research

There are numerous extensions that could be made to the financial measures, subscores, and overall financial health index; we suggest four. First, the diversity of revenue sources could augment the asset instability index and the contributions ratio, and by modeling interactions between these variables, richen the risk dynamics of those indicator. Second, the model could be generalized so that rather than calculating a contributions ratio a membership organizations could calculate a dues ratio, or a private school or orchestra could calculate an earned income ratio, yielding a financial health index tailored to industry. Third, one could conduct studies to see if the model has predictive power regarding financial vulnerability, thereby making a further contribution to that literature. Finally, it would be intriguing to see how one could couple this index with a vulnerability score or Bowman's Capacity-Sustainability Model to better understand these three models and how they intersect in profiling an organization's financial dynamics.

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ENDNOTES

¹ Most recent figure is from The Salvation Army 2011 Annual Report, page 11. Accessed online at: http://annualreport.salvationarmyusa.org/pdf/2011_AnnualReport.pdf on 12/3/11. Previous year figure is from The Salvation Army 2010 Annual Report, page 19. Accessed online at: <http://annualreport.salvationarmyusa.org/> on 12/3/11.

² Consultants offer helpful and more broadly-based lists of organization attributes characterizing financial health; examples include the work of Kate Barr (Nonprofits Assistance Fund - www.nonprofitassistancefund.org - financial resources used to achieve the mission, income stable enough to maintain programs, flexibility for innovation, infrastructural investment adequate, good stewardship of funds, and adequate cash to pay bills) and Susan Kenny Stevens (Stevens, (1997) - enough financial resources to ensure stable operations of programs, either cash on hand or cash access in times of shortfall, spending based on income flows, earns a surplus, builds up positive net assets that cover deficit years, established or will establish an operating reserve sufficient to fuel growth and meet cash shortfall, and a board that owns organizational financial stability).

³ Adapted for nonprofits from the business sector definition in Campbell and others (1984).

⁴ This measure is adapted from the Instability Index presented in Shim & Siegel (2007). Trend values for each year's Total Assets are computed using a simple trend equation. The "Asset Instability Index" reflects the deviation between actual Total Assets and trend Total Assets.

⁵ The nonprofit used is Refuge of Hope, a homeless shelter located in Canton, OH (USA). The financial statements are not publicly available but were made available to the authors and are used by permission of the Refuge of Hope Board of Directors. The Form 990s are available for this organization at www.foundationcenter.org or www.guidestar.org.

Table 1. Financial Health Index Indicators Calculation Formulas

If the indicator is followed by a + sign, higher values increase financial health.

If the indicator is followed by a – sign, higher values diminish financial health.

GENERAL CATEGORY:

#1 - Natural Logarithm of Age (+)

Where:

Age is the number of years since the organization was founded; if that data is unavailable, age may be measured by the years since the organization became tax-exempt or registered with the state in which it was formed.

#2 - Natural Logarithm of Size (+)

Where:

Size = (Total Revenues + Income & Support – Realized and Unrealized Loss on Real Estate and Investments)

#3 - Asset Instability Index (–)

$$\text{Asset Instability Index} = \sqrt{\frac{\sum(y - y^T)^2}{n}}$$

Where:

Y^T = trend Total Assets for period t , and is determined as follows:

$$Y^T = a + bt$$

Where:

a = dollar intercept

b = slope of trend line

t = time period

$$\text{GENERAL SUBSCORE} = (\text{Weight}_1 \times \text{Age}) + (\text{Weight}_2 \times \text{Size}) + (\text{Weight}_3 \times \text{Asset Intensity Index})$$

Where:

Weight₁ = multiplier for Age measure

Weight₂ = multiplier for Size measure

Weight₃ = multiplier for Instability measure

IMMEDIATE-TERM CATEGORY:**#4 - Cash Reserve Sufficiency Ratio (+)**

$$\text{Cash Reserve Sufficiency Ratio} = 1 + [((\text{Cash} / (\text{Expenses} - \text{Depreciation} - \text{In-kind Expenses})) - 0.25)]$$

Simplying:

$$\text{Cash Reserve Sufficiency Ratio} = 0.75 + (\text{Cash} / (\text{Expenses} - \text{Depreciation} - \text{In-kind Expenses}))$$

Where:

Cash = Unrestricted Cash (or, if that value is not available, Unrestricted + Temporarily restricted Cash)

#5 - Modified Cash Ratio (+)

$$\text{Modified Cash Ratio} = \text{Net Cash} / \text{Assets}$$

Where:

Net Cash = (Cash - Accts. Payable - Accrued Expenses)

Assets = Total Assets

#6 - Target Liquidity Lambda (TLL) (+)

$$\text{Target Liquidity Lambda} = \frac{(\text{Cash} + \text{ST Investments} + \text{Unused Credit Line} + \text{Avg. OCF})}{\text{Uncertainty of OCF}}$$

Where:

Cash = Unrestricted Cash (or, if that value is not available, Unrestricted + Temporarily-restricted Cash)

ST Investments = Unrestricted Short-Term Investments (or, if that value is not available, Unrestricted + Temporarily-restricted Short-Term Investments)

Avg. OCF = Average value for at least the most recent three years' values of Operating Cash Flow

Uncertainty of OCF = standard deviation of historical Operating Cash Flow values

#7 – Current Liquidity Index (CLI) (+)

$$\text{Current Liquidity Index} = \frac{(\text{Beg. Cash} + \text{Beg. ST Investments} + \text{Current Period OCF})}{(\text{Beg. ST Notes Payable} + \text{Beg. Current Portion of Long-Term Debt})}$$

Where:

Cash = Unrestricted Cash + Temporarily-restricted Cash (or, if that value is not available, Total Cash)

ST Investments = Unrestricted Short-Term Investments + Temporarily-restricted Short-Term Investments (or, if that value is not available, Total Short-Term Investments)

Current Period OCF = Operating Cash Flow occurring one period after the Cash, Investment, Short-Term notes Payable, and Current Portion of Long-Term Debt (if most recent Statement of Financial Position used for latter, use Projected Operating Cash Flow for upcoming period)

Beg. ST Notes Payable = Short-Term Notes Payable (principal balance owed on short-term borrowing)

Beg. Current Portion of Long-Term Debt = Amount of principal due within one year on Long-Term Debt

$$\text{IMMEDIATE-TERM SUBSCORE} = (\text{Weight}_4 \times \text{Cash Reserve Sufficiency Ratio}) + (\text{Weight}_5 \times \text{Modified Cash Ratio}) + (\text{Weight}_6 \times \text{Target Liquidity Lambda}) + (\text{Weight}_7 \times \text{Current Liquidity Index})$$

Where:

Weight₄ = multiplier for Cash Reserve Sufficiency measure

Weight₅ = multiplier for Modified Cash measure

Weight₆ = multiplier for Target Liquidity Lambda measure

Weight₇ = multiplier for Current Liquidity Index measure

SHORT-TERM CATEGORY:**#8 – Operating Cash Flow Ratio (+)**

$$\text{Operating Cash Flow Ratio} = \text{Operating Cash Flow} / \text{Current Liabilities}$$

Where:

Operating Cash Flow and Current Liabilities are from the same fiscal year, indicating how much of year-end near-term liabilities are covered by this year's additions to operating cash

#9 – Asset Ratio (+)

$$\text{Asset Ratio} = \text{Current Assets} / \text{Total Assets}$$

#10 – Administrative Expense Ratio (+)

$$\text{Administrative Expense Ratio} = (\text{Administrative Expenses} / (\text{Total Expenses} - \text{Administrative Expenses}))$$

$$\text{SHORT-TERM SUBSCORE} = (\text{Weight}_8 \times \text{Operating Cash Flow Ratio}) + (\text{Weight}_9 \times \text{Asset Ratio}) + (\text{Weight}_{10} \times \text{Administrative Expense Ratio})$$

Where:

Weight₈ = multiplier for Operating Cash Flow measure

Weight₉ = multiplier for Asset measure

Weight₁₀ = multiplier for Administrative Expense measure

MEDIUM-TERM CATEGORY:**#11 – Net Surplus (+)**

$$\text{Net Surplus} = \text{Change in Net Assets}$$

Where:

Score assigned for Net Surplus is based on sign (surplus if positive, deficit if negative) and size (higher surplus adds more to financial health than small surplus)

#12 – Contribution Ratio (+) up to a point, then (–)

$$\text{Contribution Ratio} = \text{Total Contributed Income \& Support} / (\text{Revenue} + \text{Income \& Support})$$

#13 – Self-Financing Ratio (+)

$$\text{Self-Financing Ratio} = \lfloor \text{Last 3 years' OCF} / \text{Last 3 years' ICF} \rfloor$$

Where:

Absolute value of ratio is reported, assuming OCF 3-year sum is positive and ICF 3-year sum is negative; If OCF 3-year sum is negative, and either ICF 3-year sum is positive or FCF 3-year sum is positive or both are OCF and ICF are positive, also use this ratio but with different and opposite interpretation

#14 – Financial Debt Ratio (-)

$$\text{Financial Debt Ratio} = \text{Financial Debt} / (\text{Financial Debt} + \text{Total Net Assets})$$

Where:

Financial Debt = (Loans Payable to Officers, Directors, Trustees, and Key Employees + Tax-Exempt Bonds + Mortgages + Other Notes Payable)

#15 – Fundraising Cost Ratio (-)

$$\text{Fundraising Cost Ratio} = \text{Fundraising Expenses} / \text{Total Contributed Income \& Support}$$

$$\text{MEDIUM-TERM SUBSCORE} = (\text{Weight}_{11} \times \text{Net Surplus}) + (\text{Weight}_{12} \times \text{Contribution Ratio}) + (\text{Weight}_{13} \times \text{Self-Financing Ratio}) + (\text{Weight}_{14} \times \text{Financial Debt Ratio}) + (\text{Weight}_{15} \times \text{Fundraising Cost Ratio})$$

Where:

Weight_{11} = multiplier for Net Surplus measure

Weight_{12} = multiplier for Contribution measure

Weight_{13} = multiplier for Self-Financing measure

Weight_{14} = multiplier for Financial Debt measure

Weight_{15} = multiplier for Fundraising Cost measure

FINANCIAL HEALTH INDEX (ϕ) Overall Score:

$$\phi = (0.10 \times \text{General Subscore}) + (0.40 \times \text{Immediate-Term Subscore}) + (0.30 \times \text{Short-Term Subscore}) + (0.20 \times \text{Medium-Term Subscore})$$

**Table 2. Financial Health Index (ϕ)
Indicators Comprising the Index and How to Interpret Them**

Indicator	Expected Sign	Dimension
<u>GENERAL (Timeframe: 0 to 36 months)</u>		
Age (Years since founding)*	+	Financial Flexibility
Size (Total Revenues & Support)*	+	Financial Flexibility
Asset Instability Index**	-	Financial Flexibility
<u>IMMEDIATE-TERM (Timeframe: 0 to 3 months)</u>		
Cash Reserve Sufficiency Ratio	+	Liquidity
Modified Cash Ratio	+	Solvency
Target Liquidity Lambda	+	Liquidity, Financial Flexibility
Current Liquidity Index	+	Liquidity
<u>SHORT-TERM (Timeframe: 3 to 12 months)</u>		
OCF Ratio	+	Liquidity
Asset Ratio	+	Solvency
Administrative Expense Ratio	+	Financial Flexibility
<u>MEDIUM-TERM (Timeframe: 12 to 36 months)</u>		
Net Surplus	+	Liquidity
Contribution Ratio	+, then -	Financial Flexibility
Self-Financing Ratio	+	Financial Flexibility
Financial Debt Ratio	-	Solvency
Fundraising Cost Ratio	-	Financial Flexibility

* Natural Logarithm used to model percent relationships and because of skewed data.

** Similar to Standard Deviation, but deviations are from regression-fit trend value rather than from arithmetic mean value.

**Table 3. Financial Health Index (ϕ)
Illustrative Example**

Indicator	Type of Indicator	Calculated Value 2009	Calculated Value 2010	Calculated Value 2011	Interpretation of Trend
GENERAL					
(Timeframe: 0 to 36 months)					
Age (Years since founding)*	Financial Flexibility	2.08	2.20	2.30	Organizations more stable and have more financial flexibility as they age.
Size (Total Revenues & Support)*	Financial Flexibility	12.87	13.54	13.57	Organizations more stable and have more financial flexibility as they grow in size.
Asset Instability Index**	Financial Flexibility	19,965	50,019	20,742	Instability in asset growth trajectory around trend makes management task difficult and lenders and other funders cautious.
IMMEDIATE-TERM					
(Timeframe: 0 to 3 months)					
Cash Reserve Sufficiency Ratio	Liquidity	1.06	1.35	1.08	Ability to cover cash expenses from unrestricted cash advanced nicely from three-month (CRSR = 1.0) level, but fell back to initial level in final year.
Modified Cash Ratio	Solvency	0.12	0.21	0.08	Unrestricted cash net of payables and accruals as a percent of total assets almost doubled, indicating significant increase in solvency, but then fell back to low level in final year.
Target Liquidity Lambda	Liquidity, Financial Flexibility	1.96	3.32	2.66	Growth in total cash, short-term investments, and unused credit line relative to variability of operating cash flows signals lower probability of running out of cash.
Current Liquidity Index	Liquidity	NA	NA	NA	Measures solvency and incoming liquidity relative to fixed financing-related payments. Organizations not having any arranged short-term notes payable or lease or bond payments coming due within the year are not scored on this index ("NA").

Table 3. Financial Health Index (ϕ)
Illustrative Example

Indicator	Type of Indicator	Calculated Value 2009	Calculated Value 2010	Calculated Value 2011	Interpretation of Trend
SHORT-TERM					
(Timeframe: 3 to 12 months)					
OCF Ratio	Liquidity	2.87	10.75	2.06	Ability to cover near-term liabilities from positive operating cash flows dramatically increased. Caution needs to be exercised here to ensure this is not due to capital contributions (building campaign), but such is not the case here.
Asset Ratio	Solvency	0.30	0.34	0.13	Organizations experiencing an increase in the proportion of assets that are cash and will soon be cash (current assets) are more solvent.
Administrative Expense Ratio	Financial Flexibility	0.17	0.12	0.16	Organizations may become more efficient as the ratio of expenses going to administration declines, yet this implies a lesser ability to trim such expenses in the event of a cash crunch or cash crisis.
MEDIUM-TERM					
(Timeframe: 12 to 36 months)					
Net Surplus	Liquidity	13,258	211,801	85,229	Sustainable organizations are best served by surpluses that are consistent and growing (as in first two years here), when the organization's expenses and asset base are growing.
Contribution Ratio	Financial Flexibility	0.75	0.57	0.60	It is helpful to have a small amount of contributions (to diversify revenues), but once high this ratio portends less financial flexibility and more risk; a decline is then helpful, as achieved here.
Self-Financing Ratio	Financial Flexibility	1.04	2.00	0.62	Nonprofits wishing to self-finance growth in plant & equipment will strive for a value of 1 or more (see the 2010 value), with higher numbers implying more of a cushion that could be used for working capital.
Financial Debt Ratio	Solvency	0.00	0.00	0.16	Similar to a debt-equity ratio, a nonprofit may use this measure to target a capital structure that has a low fraction of debt (0 first two years here) as a percent of (arranged borrowing + accumulated surpluses).
Fundraising Cost Ratio	Financial Flexibility	0.15	0.25	0.12	Donors prefer to give to nonprofits that keep fundraising expense as a percent of total contributions relatively low, so uptick in middle year is concerning.

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* Natural Logarithm

** Similar to Standard Deviation, but deviations are from regression-fit trend value rather than from arithmetic mean value.