UNSGSA

UNITED NATIONS SECRETARY-GENERAL'S
SPECIAL ADVOCATE FOR INCLUSIVE FINANCE FOR DEVELOPMENT

Measuring Financial Health:
Concepts and Considerations

UNSGSA Financial Health Working Group

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About the UNSGSA Financial Health Working Group

The UNSGSA Financial Health Working Group (FHWG) was convened in December 2020 by HM Queen Máxima of the Netherlands in her capacity as the UN Secretary-General's Special Advocate for Inclusive Finance for Development. The group is composed of financial health experts from the public, private and non-profit sectors, and it came together to advance the focus on financial health globally. Members are Hennie Bester, Centre for Financial Regulation and Inclusion (CENFRI); Payal Dalal, Mastercard Center for Inclusive Growth; Ahmad Dermish and Jaspreet Singh, UN Capital Development Fund (UNCDF); Eric Duflos, Consultative Group to Assist the Poor (CGAP); Paul Gubbins, independent technical expert; Mohammad Khalil, Commonwealth Bank of Africa; Leora Klapper, World Bank; Rob Levy, Sarah Parker, and Alejandra Ruales, Financial Health Network; Ben Mazzotta, BFA Global; Diana Mejia, Development Bank of Latin America (CAF); Ida Rademacher, Aspen Institute; Elisabeth Rhyne, independent technical expert; Evelyn Stark, MetLife Foundation; Stefan van Woelderen (previously Dagmar van der Plas), ING; and Pia Tayag and Nancy Widjaja, Office of the UNSGSA.

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This note is a companion to the FHWG's policy paper, Financial Health: An Introduction for Financial Sector Policymakers.

Introduction

Around the world, policymakers in the financial sector have begun to take increasing interest in understanding the financial health of citizens. The concept of financial health captures the state of a person or family's financial life in a way that traditional socioeconomic indicators often miss (see Figure 1). Interest in financial health was heightened by the global Covid-19 pandemic, which placed a spotlight on the challenges people face in managing financially under stress. Recognition is growing that financial health or wellbeing is a shared responsibility, with individuals, governments, financial service providers and others all contributing to create (or stymie) positive outcomes.[1]

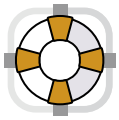
Figure 1. Definition of Financial Health

Financial health or wellbeing is the extent to which a person or family can smoothly manage their current financial obligations and have confidence in their financial future.

The elements that shape a person's financial health:

Day to day

Smooth short-term finances to meet financial obligations and consumption needs



Resilience

Capacity to absorb financial shocks

Goals

On track to reach future goals

Confidence

Feeling secure and in control of finances

An essential step toward developing policies and programs that support financial health is measuring the financial health of the relevant population. Measurement provides a concrete basis for understanding and eventually identifying factors that can lead to better financial health. In countries where the financial health concept is well-established, measurement has been instrumental in raising awareness and enabling policymakers, financial service providers and civil society to gain insights about the financial wellbeing of the groups they care most about. Financial health scales, such as those discussed here, have become public goods whose value increases as they are widely applied.

1 For further discussion of the policy implications of financial health, see the UNSGSA Working Group on Financial Health's companion to this note, Financial Health: An Introduction for Financial Sector Policy Makers.

However, measurement of this concept is not always straightforward. A central challenge is that financial health cannot be simply and directly observed. It must be inferred from multiple markers, such as missed bill payments, the availability of liquid savings, or people's own evaluations of their financial situations.[2] Further, most of the current knowledge about financial health measurement was developed in a small number of high-income countries. The practice of financial health measurement across the rest of the world is in its early stages, and methods developed in high-income countries may require adaptation.

This note provides financial sector policymakers with a discussion of the technical concepts relevant to financial health measurement. The purpose is to explain and demystify the various approaches for a non-technical audience, drawing on existing experiences and the state of the art.

For financial health measurement to be of greatest use to financial sector policymakers and others, the methods selected should meet a few important criteria. Fulfilling all these criteria at once can be challenging.

- Nationally relevant and tested. Reflects local realities.
- Easy to use. Simple and inexpensive measurement approaches can be applied frequently, in multiple contexts and by non-specialists. This is particularly important because improving financial health at a societal level requires actions by many organizations.
- Actionable. Measurement should inform decisions.
- Comparable over time and across countries, to help in benchmarking.

To meet as many of these criteria as possible, the UNSGSA Financial Health Working Group (FHWG) recommends that policymakers develop a financial health survey module – a handful of simple, plain-language questions – that function as a core set of financial health indicators and, when taken together, can provide a single score for an individual's overall financial health. There are important advantages to creating such a module:

- Can be used repeatedly to track changes over time, including changes resulting from new policies, programs, or economic conditions.
- When incorporated into broader surveys, a module allows for exploration of the relationship between financial health and other policies or concepts, such as financial inclusion, the UN's Sustainable Development Goals (SDGs), social protection programs, and others.
- Once developed, many types of users can use the financial health module for their own purposes without further need for specialized technical expertise.
- Findings are easy to communicate, which helps them influence relevant policy debates.

Short modules have proven their value in shining a light on the financial challenges families face and enabling actors throughout the financial and other sectors to identify needs and develop supportive actions. These benefits make it worthwhile for policymakers and leading organizations to invest the time and resources needed to develop a national financial health module.

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2 In statistical terminology, a condition that cannot be directly observed is known as a "latent variable." The statistical techniques discussed here are methods for examining latent variables.

In this note we explore several decisions policymakers will confront as they develop a financial health module:

- Whether to use an off-the-shelf module developed in another country, or to construct a new one.
- Whether to tie the questions in the module to the four key elements of financial health (Figure 1) – or only measure the concept as a whole.
- Whether to roll the key indicators into a numerical score.
- Whether to use hard data, such as transaction or tax data.
- How to move towards both a relevant national module and participation in global benchmarking.

The objective of this note is not to prescribe a single methodology or set of questions, but to guide measurement efforts by sharing approaches from existing efforts. The next section provides examples of measurement instruments currently in use around the world and points to sources for further reading.

Part I. The Landscape of Financial Health Measurement

A number of survey initiatives around the world have measured the financial health of populations in the past decade, in pursuit of the following objectives:

(1) To measure social progress. Leading indicators of economic wellbeing such as GDP per capita or poverty rates gloss over differences in the financial lives of individuals and families. Even at high levels of income and consumption, large population groups can struggle financially with high costs of living, job instability, unplanned expenses, and debt. Nationally representative measures of financial health can provide an additional window on societal wellbeing and elevate the financial concerns of the population as a target for policy.

(2) To measure program outcomes. Many financial services providers and social programs across the public, private, and non-profit sectors aim to enhance financial wellbeing through direct services, education, or advice. A cheap and reliable metric for financial health of the individual is a logical way to measure relevant outcomes for periodic reporting and program evaluation.

(3) To advance innovation in products and services to support financial health. Rigorous measurement of financial health provides insights for designers of financial and social services. A succinct measure of financial health can sharpen the design process, by augmenting intuition with direct evidence.

(4) To coordinate measurement efforts on a single standard. A simple, national financial health module can be used to standardize financial health measurement across the public and private sectors.

While the financial health "movement" has deep roots, it started to form an identity in the early 2010s. Seminal work in the U.S. by the Financial Health Network (FHN) and the Consumer Financial Protection Bureau (CFPB), and in Europe by Elaine Kempson and colleagues, established a foundation for conceptualizing and measuring financial health (Table 1). Most subsequent efforts have used one or more of these frameworks as starting points, or in some cases, adopted them directly.

For example, the OECD's International Network on Financial Education (OECD/INFE) incorporates the CFPB module into its survey of adult financial literacy. The FHN, CFPB and Kempson modules are backed by extensive and ongoing research, with organizations that maintain and promote their broad use. Recently, the Commonwealth Bank of Australia (CBA), together with the Melbourne Institute (MI), has created similarly well-researched modules that have been made available for other organizations to use:[3]

Two Methodological Approaches

The main objective of a financial health scale is to quickly estimate an individual's "hidden" level of financial health. The challenge is to select a short set of questions that accurately reflect this underlying attribute. Efforts to date use one of two broad approaches, which have important methodological differences. In one case, as embodied in the work of CFPB, an overall result is derived without prior constraints while in the other case, associated with the work of FHN, a framework of indicators is pre-determined using expert knowledge and/or the interests of policymakers.

CFPB's approach applies analytic tools commonly used in psychometric research to measure concepts hidden from direct view, such as attitudes, abilities, or personality. Given its focus on a person's mental assessment, researchers using that approach often use the term financial well-being. The CFPB approach emphasizes the overall validity of the combined set of questions, rather than the individual questions. Its scale combines the multiple questions into one comprehensive, quantitative measure, using statistical methods such as factor analysis or item response theory (IRT; see Annex 1 for a discussion of the analytic methods mentioned here). These techniques evaluate intercorrelations among the questions before selecting items for the composite measure. They also use these analytic tools to construct scores that take account of key patterns of responses.

In contrast, FHN's approach yields a set of indicators that each represent key aspects of financial health (See Annex 2). It represents a more deliberative process to develop a conceptually distinct yet coherent set of indicators that can support a call to action. FHN's indicator framework was developed in consultation with industry leaders, academic researchers, and policy experts. It comprises eight indicators that assess whether people are spending, saving, borrowing, and planning in ways known to support financial health in the U.S. context (FHN 2016). Because the indicators are pre-determined, they lack the same degree of analytic validity (in terms of measuring the latent variable) as those derived without constraint from consumer responses; however, FHN applies subsequent tests of validity to confirm its results.

Both organizations have developed toolkits that enable other organizations to use their questions and scores.

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3 Additional well-known surveys include Gallup/MetLife Global Financial Health survey (10 countries), Kantar Financial Inclusion Insights Survey (7 countries), Central Bank of Kenya/FSD Kenya FinAccess Survey, and BFA Global's survey in Mexico, among others. These surveys do not feature promotion or toolkits for use by other organizations.

Kempson's work follows an intermediate path, with less emphasis on constructing a score than either CFPB or FHN, and a broader mix of questions. CBA/MI has actually constructed two scales, one using an approach similar to CFPB's and another using the bank's administrative data. (See Annex 3)

While conceptually somewhat different, all these approaches follow many of the same steps, though not always in the same sequence.

Table 1. Leading Financial Health Measurement Scales

Institution	Name of Measurement Scale	Description	Related Collateral
Consumer Financial Protection Bureau (U.S. Government agency)	CFPB Financial Well-Being (FWB) Scale	CFPB's 5- or 10-question module (there are two versions) queries consumers' perceptions about their financial security and freedom in the present and in the future. CFPB's Financial Well-Being Scale gives a single score from 1 to 100, from severe financial stress to a high degree of satisfaction with one's financial situation.	User Guide Methodology
Financial Health Network (FHN) (Non-profit institution)	FinHealth Score	FHN's FinHealth Score 8 indicators associate two questions each with four components of financial health: spending, saving, borrowing and planning. FinHealth Scores run from 0 to 100 and are sorted into three tiers: vulnerable (0-39), coping (40-79) and healthy (80-100).	User Guide (Toolkit) Methodology

Elaine Kempson et al. / U.K., Canada, Norway, Ireland, Australia & New Zealand (Government-University partnership)	Financial well-being	One example of a series of studies in various countries, Kempson's Norway index is derived from 11 survey questions that measure financial capability and financial distress. Questions are grouped into "components" of financial health using statistical methods. Calculates a score out of 100 possible points for each component and for the respondent's financial wellbeing.	Norway methodology & results Ireland methodology & results
Commonwealth Bank of Australia (CBA) & the Melbourne Institute (MI) (Bank-University partnership)	MI Financial Wellbeing (FWB) Scales	CBA-MI developed a *reported* financial well-being scale based on responses to a 10-item survey module broadly similar to CFPB's (a 5-question version is also available) and an *observed* scale based on 5 indicators derived from customer financial records.	User Guide Methodology

A variety of other scales have been created, such as those developed in Mexico by BFA Global and Kenya by the Central Bank of Kenya and its partners. The CFPB and FHN scales discussed here were selected because they are mature and influential examples that illustrate the methodology questions at stake in financial health measurement.

Other Data Relevant to Financial Health

Survey responses relevant to financial health are often collected without being pulled into a comprehensive financial health module or score. Many surveys, such as the OECD's How's Life? include one or more of the same consumer questions as asked in financial health modules.

Survey programs including the World Bank's Global Findex, the U.S. Federal Reserve Bank's Survey of Household Economics and Decision-making, the U.K.'s Longitudinal Wealth and Asset Surveys, Survey programs including the World Bank's Global Findex, the U.S. Federal Reserve Bank's Survey of

Household Economics and Decision-making, the U.K.'s Longitudinal Wealth and Asset Surveys, and the EU's Survey of Income and Living Conditions provide one or several indicators relating to an element of financial health, most typically financial vulnerability or resilience (Table 2).

Researchers at Innovations for Poverty Action have argued that a focus on resilience, as measured through a question such as the ability to come up with a lump sum during an emergency, is a strong proxy for the broader financial health concept (Lasse, et al.). Through the Global Findex, this resilience indicator has been collected in about 150 countries in 2014, 2017 and soon 2021. It provides the most complete global picture of financial health currently available.

Other forms of data can also be brought to bear on financial health. In an approach that relies on financial data rather than consumer views, the U.K. Office of National Statistics uses total household income and the current value of formal financial assets to construct an indicator of the expected ability to cover a financial shock. Financial ratios such as this one can be constructed wherever national statistics agencies routinely collect data on income or assets through surveys or administrative data (such as tax records). While such data are more available in OECD countries, the World Bank's Living Standards Measurement Study (LSMS) program has released a set of recommended modules for measuring asset ownership and control for low- and middle-income countries (Kilip and Moylan).

At a smaller scale, financial diaries studies in several countries have collected comprehensive data on money movements into and out of low-income households, providing a rich resource for understanding the strategies households use to pursue financial health.[4]

Table 2. Sample Free-standing Indicators of Financial Health (not gathered into a module or scored)

Survey Program	Sample Indicator
Global Findex, World Bank	Percent of adults able to access 1/20th of GNI per capita for an emergency within 30 days
Survey of Household Economics and Decision Making (SHED), Federal Reserve Board (U.S.)	Percent of adults that could cover a hypothetical expense of $400, using cash or its equivalent.
Wealth and Assets Survey, Office for National Statistics (U.K.)	Proportion of households with sufficient formal financial assets to cover a three-month reduction in household employment income
How's life? 2020: Measuring well-being report (OECD)	Share of population who have difficulty or great difficulty in making ends meet (self-reported)
Wealth distribution database (OECD)	Share of individuals who are financially insecure (have insufficient liquid financial wealth to support them at the income poverty line for more than 3 months)

4 For more on the financial diaries methodology and projects around the world, see BFA's website: https://bfaglobal.com/our-work/financial-diaries/.

Part II. Developing Measures of Financial Health

This section aims to assist policymakers in deciding among four approaches to constructing a financial health module. First, policy makers may simply adopt a module that has already been developed and tested in another country. This is a low-resource, practical choice, especially as a first step. However, its drawback is that the module's validity may not carry over into a different economic and cultural context. Second, policymakers may develop a financial health scale using survey research and statistical techniques designed for assessing latent variables – as embodied in the CFPB scale. Third, policymakers may deploy a pre-set indicator framework – referencing the FHN module. This third approach requires many of the same steps as the previous one, and, from a process point of view, can be seen more as a variant than a completely different approach. Fourth, policymakers may be able to use hard data from accounts or transactions, though this approach is still in its early stages. Finally, there are many calls for a globally relevant measure of financial health, which will require further research and testing by the international community.

The FHWG's broad recommendation is that while policymakers may begin with an off-the-shelf approach, they should move quickly to the second or third approaches, with local consumer validation. The choice between the second or third approach depends on the policy purpose. Experimentation with the fourth (hard data) approach may yield additional insights, but given data limitations, it is not likely to become the primary approach to measuring financial health at this time.

Using Off-the-Shelf Measures

It is appropriate to use an existing toolkit in the short run, such as to add a financial health module to an existing national household survey. Three rigorous and extensively researched toolkits are available to get started on financial health measurement: FHN's FinHealth Score (U.S.), the CFPB's financial well-being scale (U.S.) and CBA-MI's reported financial wellbeing scale (Australia) (Table 1). The OECD's financial education network (INFE) has adopted the CFPB's scale with some national-level testing, and it has been used in more than 20 countries, primarily in central/eastern Europe and in South America. This has provided an important introduction in many of these countries to assessing the financial health of their populations.

However, since these tools were developed and fine-tuned in high-income settings, practitioners should consider whether their concepts and question sets align with their own national context. The depth of financial inclusion and available financial services is likely to affect the selection and wording of specific questions, particularly for less subjective questions such as FHN's FinHealth score questions on credit scores and insurance.

Even when the questions in these toolkits resonate locally, the validation process that lends confidence to the measurement instrument may not reflect other aspects of the context. Differences in social safety nets and health care systems may affect whether specific survey questions remain relevant in a new setting. The CFPB Financial Well-Being Scale, for example, is validated against details of financial life in the U.S., such as consumer credit scores, debt collections, and other items. When deploying a pre-existing scale in a new context, researchers should validate the scale against locally relevant markers of financial health. Furthermore, the scoring mechanisms in these toolkits were optimized against the national or customer populations that were used for developing

and refining those instruments. That scoring system may not sufficiently differentiate the levels of financial health between individuals in a different population.

Using an off-the-shelf scale or indicators will facilitate international comparisons of financial health. Yet, these comparisons may miss important differences, especially in low- or middle-income countries, which could lead to perceptions that those toolkits are less reliable or legitimate. The alternative is to develop a new scale in consultation with national stakeholders, as addressed in the next two sections.

Developing a Financial Health Scale

This section describes the process of constructing a financial health scale. The final product comprises a handful of multiple-choice survey questions (generally 5-10) and a scoring process which combines the responses into a score. The score is a measure of an individual's financial health at a given moment. Once constructed, a financial health scale is easy to use and can be cheaply and widely applied.

However, a valid scale must be constructed with care and rigor. The process of scale development can be thought of as a systematic search for the set of questions that best embodies the latent variable. In the parlance of statistics, financial health is a latent (or unobserved) variable, which is approximated from observed variables (survey responses). Researchers use statistical methods to derive their final set of questions and scoring rubric from a longer set of survey responses.

The process of developing a scale to measure financial health follows a standard pattern, exemplified by CFPB's financial well-being scale (2017a), Kempson, Finney, and Poppe's work in Norway (2017) and BFA's work to develop a financial health scale with two financial cooperatives in Mexico (Mazzotta):

1. Test a long list of possible questions to ensure consumer understanding and relevance. Perfect the wording and select a subset of questions as candidates for the scale.
2. Conduct a large representative survey with the candidate questions.
3. Select a short set of final questions by fitting the best statistical model and validating against selected survey data.
4. Create a scoring rubric and assess the reliability of the scores.
5. Publish the scale (the short list of questions with an accompanying scoring rubric) to allow others to use it.

As a valuable by-product of scale development, this process will also yield initial learning about the financial health of the population to inform a wider audience.

Creating and testing candidate questions. When developing a set of candidate questions, considerations to keep in mind include a question's relevance to the intended construct, i.e., to financial health, and whether the responses will be amenable to statistical analysis. It will also be essential to test whether respondents understand the question's phrasing and interpret it as intended. For example, savings has been a challenging concept to measure, as people hold various definitions of what constitutes savings.

Alternate ways of referring to savings include phrases such as "putting money aside." Appropriate questions use plain language and simple sentences. A practical starting point is to consider questions from existing surveys of financial health, which have been extensively tested with users

and validated against related concepts.[5] When developing its scale in Mexico, BFA Global selected questions from the global literature on financial health and adapted the language to match respondents' description of their own financial behavior, avoiding phrasing that presupposed financial access or steady income from employment.

In this early phase, researchers gather expert feedback and test questions with prospective users through small surveys. This process is iterative and could involve multiple rounds of data collection and analysis. Qualitative research is beneficial to test comprehension and probe how people conceive of financial health and evaluate their financial lives. Researchers may also begin to investigate how responses change by population subgroup, such as by income, gender, or geography.

The role of perceptions in questions. One consideration in question design is whether to ask about perceptions and emotions, hypothetical situations, and/or future, current or past experience. CFPB's questions focus on perceptions and emotions, such as the respondent's degree of agreement with this statement: "My finances control my life." By contrast, the Global Findex resilience question refers to a hypothetical situation (ability to come up with a lump sum in an emergency), and FHN's questions generally point toward objective status (e.g., current debt load and credit score). While this range may be discussed as a spectrum from more subjective to more objective, it is important to recognize that all such survey questions are partly subjective because they depend on a respondent's recall, estimation, and interpretation.

Distinguishing behaviors and outcomes. In selecting questions, it is important to attempt to keep behaviors and outcomes distinct. The concept of financial health is conceived of as an outcome. One much-desired use of a financial health scale is to test the efficacy of interventions, from financial inclusion to debt counseling. In order to have a logical chain of inference, behaviors cannot be part of the measurement of the end state. This is a complex area, because some behaviors correlate strongly with measures of financial health. For example, the question "How often do you use credit to pay for food and other daily expenses?" is highly correlated with poor financial health in Kempson's studies. (Kempson and Poppe 2018)

Allowable responses. In many financial health scales, the questions request ordered responses using a five-point scale, a common technique in psychometric surveys. Questions that elicit somewhat subjective information might ask which of several responses best describes the respondent's perception about the state of their finances. For example:

- How well does this statement describe you or your situation? "I can enjoy life because of the way I'm managing my money" (Completely; very well; somewhat; very little; not at all) (CFPB: Find out your financial well-being)

Questions about relatively objective information might ask whether or how often specific types of events have occurred or might occur in the future:

- How often do you have money left over after you have paid for food and other regular expenses? (Very often, Often, Sometimes, Seldom, Never) (Kempson and Poppe 2018)
- If your income fell by one third, for how many months could you meet all your expenses without needing to borrow? (More than 12 months, between 6-12 months, between 3-6 months, between 1-3 months, 0-1 months) (Kempson and Poppe 2018)

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5 The UNSGSA working group has compiled a financial health questionnaire item "bank" that compiles questionnaire items from multiple financial health instruments. This resource is available upon request, please email: info@unsgsa.org.

The BFA Global scale developed for Mexico provided one set of ordered responses for each question, from total disagreement to total agreement. Offering identical response choices to every question minimizes the influence of phrasing or word choice on the covariance of responses. Thus, they paraphrased the above question:

- If I lost all my income and had to survive on what I have put aside, I would be able to pay for essentials for four weeks, without borrowing money or selling something. (Total disagreement, neither agreement nor disagreement, agreement, total agreement) (Mazzotta)

The drawback of such paraphrasing is that it impedes comparison with other studies that have asked about the same concept with different wording.

Selecting the final items. Once a pool of potential questions has been identified and field-tested, a large survey can be conducted among a representative and diverse sample of the target population. Standard considerations for conducting a rigorous survey regarding sample selection, enumerator training, data cleaning, and the like, are all essential to ensure the credibility of the survey.

When the survey is complete, the final selection of the short set of questions for the scale can begin, and this requires specialized analytic techniques. The statistical procedures to be deployed are designed to solve a core challenge: that financial health is a latent variable, hidden from direct observation but revealed indirectly through answers to multiple survey questions. The techniques include principal component analysis (PCA), item response theory (IRT), and factor analysis. (See Annex 1) These techniques help identify select questions that are particularly good at capturing most of the information inherent in the data. Some statistical techniques (factor analysis and IRT) test a theoretical model of the latent variable, while others (PCA) have no prior model. By applying one of these techniques, researchers arrive at the set of questions to be used in the final instrument and in scoring. Additionally, non-statistical considerations, such as simplicity, ease of interpretation, and policy-relevance may affect the ultimate selection.

One of the decisions facing researchers developing a scale is whether to treat financial health as a unidimensional or multidimensional concept. That is, whether to measure the constituent aspects of financial health separately (such as day-to-day, resilience and goals) or to treat them as part of a single underlying concept. The set of candidate questions should include multiple questions representing each constituent element of financial health. The FHWG definition of financial health includes four inter-related elements (day-to-day, resilience, goals, and confidence), which would need to be represented in various questions. This decision can be informed through exploratory analysis. Multidimensional techniques are available to explicitly model separate components of financial health.

Kempson (2017), for example, uses PCA to measure three separate aspects of financial health: meeting commitments, feeling comfortable, and resilience for the future. Each question is related to one aspect of their definition of financial wellbeing. For an overall score, the study combined measures of each of three aspects. Other multidimensional approaches are also in use, such as the BFA study in Vietnam (2021), which used confirmatory factor analysis to derive point values for four components of financial health from 14 survey questions.

Finally, researchers may want to analyze differences in response patterns across important population sub-groups. Using IRT, CFPB estimated distinct scorecards for working age and older consumers:

same questions, but different scoring. It also differentiated scorecards depending on whether individuals self-administer the survey (versus respond to an interviewer).

Scale scoring. Once the responses to each question have been collected, the responses are converted into a numeric financial health score. The simplest scoring mechanism is a sum of responses. This method is used by CBA in Australia with its 10-question Reported Financial Wellbeing scale. For each question, the five possible responses are assigned a point value from zero to four. Each question is given the same weight, resulting in a possible 40 total points. The sum of response values is multiplied by 2.5 so that the final scores will be reported in the easily understandable range of 0 to 100. Separately, researchers conducted additional testing to validate that the simple scores correlate very highly with model-based scores, in the case of CBA against an IRT-predicted factor and in the case of FHN against a PCA score.

Some scoring models use analytic techniques including IRT and PCA, to derive a score. Such model-based scores are typically re-scaled to make them easier to use. CFPB and Kempson (2017), for example, transform model-based scores (which fall on a normal distribution) to a more widely dispersed range of 0-100.

Validation and further research. The validity of financial health scores is usually assessed by examining their association with related concepts such as financial behaviors, income levels, satisfaction with financial life and material hardship. As a result, it is important to include not only candidate items for a financial health instrument in the survey, but also questions that can help validate the scale. This is especially important when using an existing instrument off-the-shelf, as it provides an opportunity to assess how well the instrument correlates with locally relevant variables.

To increase the utility of financial health measurement efforts, data is often collected on both financial health outcomes and potential financial health drivers or determinants. Data on both outcomes and drivers enables reporting not only on the levels and distribution of a population's financial health, but also points the way toward exploratory research that can help pinpoint the factors that most strongly enable or hinder financial health.

Indicator Frameworks

The process of developing a financial health scale based on an indicator framework is roughly similar to the process just described: it moves iteratively from a longer list of questions to a selected handful through testing and analysis. The key difference is the extent to which expert judgment, industry knowledge, and relevance to policy/products inform and constrain question selection. While the scale development process described above is derived without prior constraint from detailed consumer surveys, an indicator framework is set according to expert judgment that directs surveys to ask certain questions and analyze data in certain ways, in order to link the resulting framework with policy or action-oriented concepts. One reason for choosing this approach is to focus subsequent analysis and discussion on each distinct indicator as opposed to only the overall concept.

FHN's indicator framework features eight indicators based on four action-oriented elements: spend, save, borrow, and plan (See Annex 2.) In establishing this framework, FHN aimed to enable financial institutions to see the connections between their products and customer financial health. Thus, the research process for selecting and validating questions was constrained in advance by conceptual choices.

Each indicator in FHN's framework also has a set of recommended benchmarks or specific thresholds, used to determine how an individual or population compares to other groups or to itself over time. For example, for the indicator "Have sufficient long-term savings or assets," the thresholds would involve moving from less than one month of living expenses in liquid account balances, to between one and five months and optimally, to six or more months (FHN 2016).

FHN's framework, as well as frameworks in other domains such as the multidimensional poverty index (Oxford Poverty and Human Development Initiative) and the human capital index (World Bank), also include a procedure for combining the indicators into a composite numeric score. FSD Kenya's multidimensional financial health index measured through the FinAccess survey program uses the aggregation mechanics of the multidimensional poverty index to create summary measures of financial health at the population level.[6]

Transaction Records and other Data Sources

With the growth of online and mobile financial services, customers are leaving ever larger digital footprints that can be mined for insights. A few recent efforts are exploring whether insights about customer financial health can be obtained through the analysis of this data, although firm conclusions and best practices are not yet available.

In preparing for its recent report on financial health trends, FHN invited adults to link their financial account data through a secure online platform (FHN, 2020b). This provided a window into transactions and balances in checking, savings and credit card accounts. The research team constructed metrics for individuals, such as frequency of late payment fees on a credit card or average account balances. FHN observed how events over the course of the pandemic shaped cash flows, spending and borrowing (See box on page 16). FHN has released a brief on how to use such administrative data (FHN, 2021).

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6 For a detailed description of the indicators and methodology: https://www.fsdkenya.org/blog/building-a-better-compass-creating-financial-inclusion-measures-that-are-allied-with-people-and-their-well-being-part-2/

Researchers are still studying the best way to construct administrative data metrics that convey signals about financial health. CBA produced a candidate set of 18 metrics based on financial records, only eight of which were sufficiently correlated with self-reported survey data to be used in their financial health scale (See Annex 3).

Account and transaction data have some advantages over self-reported survey data. For example, transactions are verifiable and recorded in real time. However, there are also challenges:

- Given the high frequency and detailed nature of transaction data, analysts have a vast array of choices and work to construct indicators from them with meaningful features for financial health.
- Financial institutions do not have fully complete records of a customer's financial life. Data from services or government agencies (such as tax authorities) that aggregate information across accounts can overcome some of these challenges, except where most transactions occur in cash.
- Inferences from a financial provider's customers may not be representative of a broader population of interest, so sample bias and generalizability may be an issue.
- Although transaction data does not have the high costs of survey data collection, it still requires significant investment. Accessing, cleaning, and analyzing transaction data from databases and other back-end systems requires skilled data professionals.

Metrics derived from transactional data could be perceived as unbiased, verifiable and tangible. Considering the issues outlined above, it may be better to view them as complementary to survey-based measures rather than as substitutes. Further research is needed on the relationship between transaction-based and self-reported measures of financial health.

Financial transaction records are not the only type of data that may provide insights about a customer's financial health. Some fintech apps use voluntarily shared access to smartphone data, such as from social media, internet browsing, and geolocation to extract insights about a customer's creditworthiness. Powerful new techniques such as natural language processing are enabling providers to translate digital footprints into actionable insights.

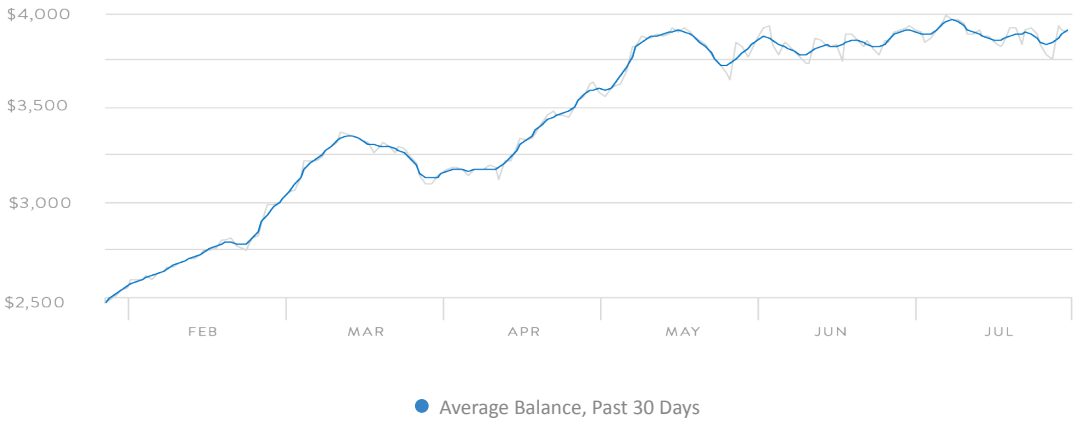
Box 1. Tracking Financial Health Dynamics in the Covid-19 Pandemic Using Transaction-based Metrics: Commonwealth Bank of Australia and Financial Health Network

With the help of the Melbourne Institute, CBA maintains two financial wellbeing scales – one using survey responses (the reported scale) and one using transaction data (the observed scale). During the pandemic in 2020, CBA saw a 10% improvement in the observed financial health of its customers due to increased savings and reduced spending. It also observed a 7% decline in reported wellbeing, suggesting that people had anxieties about future developments, such as employment prospects, expenses, and the duration of temporary government support (M. Khalil, personal communication, February 10, 2020).

FHN found an improvement in financial health in the U.S. during the pandemic using its self-reported FinHealth score, attributed largely to the U.S. government's pandemic relief programs, including stimulus checks, unemployment insurance and debt relief as well as reduced consumer spending under lockdowns. These findings were backed by analysis of transaction records shared voluntarily by adults in the 2020 study. For example, stimulus payments accounted for the large rise observed in liquid account balances in April (FHN 2020b).

Average 2020 liquid account balances among participants in FHN study

Daily median of average liquid account balances over the past 30 days.



The findings from FHN and CBA suggest that conclusions about the levels and trends of a population's financial health can be sensitive to the specific instrument being used to measure it. They show that survey responses and account/transaction data are highly, but not completely, correlated, and point to the differences between them as focal points for insights.

Global Indicators

While this note has focused on national financial health scales, there is increasing interest in a global scale to enable cross-country comparisons and benchmarking. Global indicators such as the Human Development Index or SDG-linked indicators are important tools for directing international development policies and resources. Policymakers also benefit from understanding how financial health in their countries compares to others.

Currently, the most globally extensive data on financial health comes from the World Bank's Global Findex, applied in roughly 150 countries every three years. The Findex asks about the resilience element of financial health through querying the respondent's ability to raise a lump sum in an emergency. There is no attempt to create an overall financial health scale or score.

The second-most-applied data collection on financial health comes through the OECD/INFE survey, which included the five-question CFPB scale in its 2020 survey of Adult Financial Literacy. This survey, with local adaptations, has been applied in over 20 countries.

The FHWG recommends that work commence to develop a widely accepted financial health scale. A multi-stakeholder process could resolve some of the outstanding conceptual and technical issues and develop a set of indicators for global comparisons. An optimal outcome of this process would be a comprehensive methodological guideline that provides national statistics offices and other data collection agencies with the technical details necessary to measure financial health in a standardized way across countries.

Part III. Summary Recommendations

The emergence of several approaches to measure financial health in the past decade has created variation in the practice of measurement, rooted in different perspectives of the financial health concept, intended applications and available data. As a result, current practitioners and policymakers face a menu of methodological options. The FHWG invites policymakers and practitioners to familiarize themselves with the trade-offs involved and to choose an approach that makes sense for their specific context and needs. In the introduction, several questions were posed that policy makers would have to answer in developing their approach to financial health measurement. This note suggests answers to these questions, which are summarized here.

Using an off-the-shelf module developed in another country versus constructing a new one. It can be appropriate to begin with a module developed and validated elsewhere, particularly if the questions are applicable to the local context and target population. If not, it is worth investing resources to develop a survey module, possibly in partnership with a local research institution, that follows the in-depth process described here.

Tying the question items in the module to the four key elements of financial health. This choice depends on the purpose of the module, which in turn determines the extent to which the model follows the bottom-up versus the expert-informed paths described above. The FHWG is in favor of ensuring that candidate questions address all of the four elements of its financial health definition: day to day, resilience, goals and confidence.

***Rolling the key indicators into a numeric score*.** A score can be a powerful communications device: it is easy to understand, and it facilitates comparisons across time and populations. However, scores are abstract, and subsequent analysis is required to uncover policy-relevant insights. Therefore, scores, while valuable, should be backed by elaboration on the key indicators that comprise it, as a step toward diagnosis of potential policies or programs.

Using account, transaction, or tax data to construct the financial health module. Measures of financial health based on administrative data can be important complements to a survey-based measurement program. There is much exploration going on in this area at present, and policymakers may wish to participate if they have both the data and the required analytic capabilities.

***Moving towards both a relevant national module and global benchmarking*.** A collaborative multi-country research process could build on the existing state of the art to test a global financial health module. Given that national policymakers' first priority will be to develop a national scale, participating in a global process could support that aim while also contributing to an international effort.

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Annex 1. Statistical techniques used in scale development

Leading financial health scales use statistical analysis of survey data to select questions and generate scoring rubrics. The central paradigm is that financial health is a latent, or unobserved variable, and that surveys can collect information relevant to the variable, even though it cannot be observed directly. Financial health is measured by how it influences a person's responses to those survey questions. In an unconstrained model, none of the survey questions is considered intrinsically a better measure of health than the others, and they are all subject to a certain amount of luck or noise. The overall pattern of responses to all the survey questions together allows inferences about a respondent's financial health.

Item response theory (IRT) and its cousin, multidimensional item response theory (mIRT), are used to assess how well a test performs in providing reliable evidence of ability, skill, or competence (van der Linden and Hambleton). In this instance, financial health would be considered a competence, and IRT is the branch of statistics devoted to assessing whether a given test is a good test of that competence. The most common variants of IRT assume that the latent variable is unidimensional (Edwards); however, it is also possible to conduct multidimensional IRT that allows for heterogeneity in response according to traits of the test taker. As currently applied to financial health, mIRT has not been used to assess financial health in a multidimensional way, but to create scorecards that account for heterogeneous respondents, as CFPB has done in constructing slightly different scoring for older adults, and for those who complete the survey online (CFPB 2017). Software and statistics in this field are developing rapidly.

To date, financial health question sets have been scored with a fixed list of questions and equal points for each response. However, variations in IRT can be used to develop a score with different point values for each question. It can also be used with adaptive computerized testing, which selects questions based on the respondent's early answers.

Principal components analysis (PCA) is a time-honored technique used to reduce the dimensionality of a dataset (Abdi and Williams). PCA analyzes the covariance matrix of responses and solves for what are known as eigenvalues: In a given set of questions, the first eigenvalue explains the largest percentage of the total variance. The greater the proportion of the variance explained, the higher is the tendency of responses to go together in the dataset. For each succeeding eigenvalue, the responses to each question may correlate with that eigenvalue to a lesser degree. A set of ten questions will have ten eigenvalues in the covariance matrix, and the cumulative variance explained will be one hundred percent. But the last eigenvalues will explain the least variance. So, intuitively, a researcher might look at the first two or three eigenvalues to assess which questions to group together and how much of the total covariance is explained. The PCA literature includes several tests to assess how many latent factors are likely to determine the responses in a survey dataset (Raich, et al.). FHN used PCA to corroborate its FinHealth Score.

Factor analysis is a related set of models that can accommodate financial health as a multidimensional concept (Bartholomew, et al.). Such a model would make sense if hypotheses indicate that the components of financial health – day to day, resilience, etc. – vary independently. However, questionnaires on financial health could be too short to fit multidimensional models (Forero and Maydeu-Olivares).

In a typical three-phase factor analysis, the first phase studies the correlation matrix to determine how many latent variables best explain the observed correlation. The second phase, exploratory factor analysis (EFA), groups the questions based on their covariance, using a transformation of the covariance matrix known as a rotation. Researchers can select algorithms that force the latent variables to be uncorrelated, or that allow correlations. The third phase, called confirmatory factor analysis (CFA), evaluates the model fit and estimates the correlation between each question and one of the latent variables. The CFA stage may incorporate only the results of the EFA; or alternatively, researchers can adjust the groupings of questions based on subject matter knowledge.

With any of the models above (IRT, PCA, and CFA), researchers may choose to disseminate a scoring model based exclusively on the raw responses to questions; or they may choose to publish the scorecard developed with advanced statistical methods. Thus, if each question has a range of responses from 0 to 4, the raw point values from a set of 15 questions could range from 0 to 60. The scorecard developed with IRT or another method might range from 0 to 100, and the scorecard might have a distribution that is either flatter or more peaked than the raw scores' distribution.

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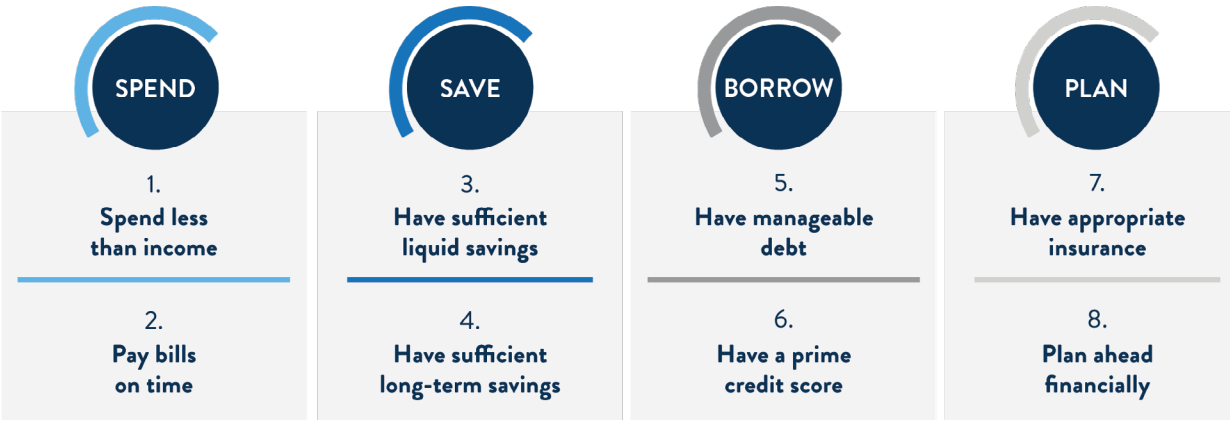
Annex 2. Financial Health Network's FinHealth score framework



Financial Health Network recognized the importance of measurement for organizations to understand the financial health of their customers and track the financial health impact of their products and solutions. The FinHealth Score Toolkit enables businesses and other organizations to measure financial health through an easy-to-use, open-source document. The Toolkit includes: 1) survey questions 2) methodology to score the survey and 3) U.S. benchmarks updated annually through the Financial Health Pulse.

Several factors contribute to the adoption of the FinHealth Score by over 70 companies since its release in 2018.

1) **Allows companies to compare their customers to national benchmarks.** The Financial Health Pulse was launched in 2018 as a nationally representative annual survey of financial health in the U.S. The findings and data are public, allowing calculation of national, regional, and demographic benchmarks.

2) **Transparency, accessibility, and straightforward methodology**: The open-source, simple methodology does not require sophisticated software or analytics. This enables many types and sizes of organizations to measure the financial health of their customers – and even share their scores with customers.

3) **Public visibility and cross-learning opportunities through the Financial Health Leaders Program.** FHN's Financial Health Leaders program promotes measurement and best practices across the industry. Participating companies are not required to use the FinHealth Score; however, most participants have adopted it. In 2020, over 70 companies worked with FHN and measured the financial health of a combined total over 10 million customers.

The FinHealth Score Toolkit has helped spread a common framework for measurement of financial health and promoted measurement as a common practice across the sector.

For more on the FinHealth Score Toolkit: https://finhealthnetwork.org/score/. For more on FHN's measurement work: https://finhealthnetwork.org/research/financial-health-measurement/.

Annex 3. Commonwealth Bank of Australia and Melbourne Institute's Financial Well-Being Research

The collaboration between Commonwealth Bank of Australia (CBA) and the Melbourne Institute (MI), an eminent economic and social research center, has advanced understanding of financial well-being in Australia and abroad – beyond what either organization could have achieved working alone. In 2017, the organizations partnered to develop robust measures of financial wellbeing:

- To better understand the state of individual financial health
- To uncover the drivers and determinants of better outcomes
- To have a measure for rigorous evaluation of financial wellbeing efforts

Each organization leveraged its own core competencies. CBA provided access to large scale, longitudinal, anonymized customer data, and access to its customer channels for surveys. MI provided expert social researchers with extensive experience developing rigorous measures for use by government, corporations, and non-profits.

Using data gathered with CBA's assistance, MI produced two measures: the Reported Scale, a five- or 10-question survey (two versions available), and the Observed Financial Wellbeing Scale, which uses customer transaction and other data in CBA's database (with privacy protections). These measures are freely available to individuals to evaluate their own financial well-being and for organizations to uncover opportunities and evaluate the impact of their efforts to support customer financial health. Both measures are backed by the academic rigor and credibility of MI and the scientific peer review process.

CBA and MI encourage wider adoption of the scales as a standard measure of financial health as well as further research and enhancements to these measures by other organizations. Multiple banks around the world have already adopted or adapted one or both measures.

CBA has also begun experimenting with transaction-based indicators, such as the following:

- *Net spend*: Monthly measure of all inflows into CBA accounts divided by all outflows
- *Income volatility*: Range of monthly inflows over the year, divided by average monthly inflows
- *Unpaid credit card balances*: Based on credit card statements, repayments, and balances
- *Frequency of near-zero balances*: Proportion of days on which liquid balances are less than a week's average outflows
- *Ability to cover one month of expenses*: Proportion of days customer's net position was more than monthly outflows

To read the main report on the two scales: https://www.commbank.com.au/content/dam/commbank-assets/banking/guidance/2018-06/using-survey-banking-data-to-measure-financial-wellbeing.pdf?ei=what_UniMelbPDF.

To explore how CBA and MI are using the Financial Wellbeing Scales: https://www.commbank.com.au/personal/newsroom/financial-wellbeing-scales.html; and https://melbourneinstitute.unimelb.edu.au/data-tools/tools/financial-wellbeing-scales