Financial Wellness Lab: State of the Nation | December 2021

Table of Contents

SECTION 1: INTRODUCTION

The purpose of this paper is to create a framework to be used by the stakeholders associated with the Financial Wellness Lab for engagement and collaboration. The framework seeks to document what we know so far, what we don't know and where we plan to go next.

Financial wellness is a complex puzzle with a myriad of intertwined subtleties. The lab's current mandate will not solve all of the issues or complete the entirety of the puzzle. For that, we will require collaborators. The lab's goal is to develop quantitative finance and data analytics solutions that will enable Canadian households to enhance their financial resilience. Combining state of the art actuarial and financial models and the comprehensive datasets provided by the lab's corporate partners, the lab will generate insights and solutions for Canadians to help facilitate data driven financial decision making – grounded in real-world objective data analysis. The lab's industrial partners are committed to making these insights and solutions broadly available at the workplace or in the home – taking the insights from the chalkboard to the floorboards.

Canada's Financial Wellness Lab

The lab resides in Western University's Faculty of Science, leveraging strengths in actuarial science, financial modelling and data science. Academic partners from the Ivey Business School, Wilfrid Laurier University, UBC Okanagan and the University of Winnipeg are also part of the team. The academic team is joined by four industry partners - the Canadian Payroll Association, Aligned Capital Partners, Ceridian and LifeWorks – who are providing the lab with anonymized data on the financial circumstances of thousands of Canadians showing how much they spend, save and earn.

Before we can begin to collaborate, we will need a solid foundation that includes a shared view of the problem we are attempting to solve – derived from empirical, data driven insights – i.e. the lab's current mandate.

At each step in our journey, it is important to socialize our conclusions from a spectrum of 'points of view.' Those perspectives will include both academic, industry and policy-maker views. Our overarching goal is to ensure our conclusions will enable Canadian households to enhance their financial resilience by operationalizing these insights. To do so, we will need all the stakeholders moving in the same direction with shared views of the problems we are attempting to solve.

This paper approaches the challenge from five perspectives.

Section 2 articulates why financial wellness is important and, based on the research thus far, how a lack of wellness impacts Canadian households.

Section 3 provides a definition for financial wellness, which will change and evolve over time as the research provides more insights.

Section 4 summarizes the various research methodologies that have been deployed to date by academics, industry and policy makers. The methodologies each have their own strengths and weaknesses but when viewed together, they start to reveal a compelling picture of financial wellness.

Section 5 summarizes the conclusions reached thus far and the six emerging themes. Importantly, we've also documented our blind spots or areas where there is work left to do.

Section 6 then presents a view on the priorities for future research and actions.

As you will see in Section 2, the case for financial wellness is compelling – not only because financially resilient households lead to a healthier society and economy but because financial wellness is also deeply intertwined with physical and mental health. We are hopeful that this paper will inspire the readers and ultimately lead to a stronger Canada. But we will need to be mindful of the old adage - it's a journey and not necessarily a destination.

Lab Personnel Contact Information

Name	Role	Email
Matt Davison	Principal Investigator	**mdavison@uwo.ca**
Chuck Grace	Program Director	**cgrace@ivey.ca**

SECTION 2: THE CASE FOR FINANCIAL WELLNESS

Financial stress can affect anyone – young or old, married or single, rich or poor. And when it does, its impact can overwhelm us at home and at work. Lost productivity due to employees worrying about personal finances is estimated to cost Canadian employers over $20 billion[1] each year or 7 to 14 working days per year[2].

A financially resilient individual is able to withstand financial setbacks such as sudden loss of income or unanticipated expenses. Low levels of financial resilience are a strong predictor of financial stress[3] and can lead to more serious health problems[4]. Financial stress is alarmingly widespread among the Canadian population. The lab's team found that between 2009 and 2019, one third of employed Canadians were financially stressed[5]. If a large number of Canadian households are financially fragile, Canadian society is less able to withstand unexpected shocks[6].

The events of 2020 and the economic impact of COVID-19 give increased urgency to the topic of financial resilience. The financial cost on all levels of government for financial countermeasures to COVID-19 are becoming apparent and a stronger understanding of the prevalence and type of financial fragility in Canadian households will allow more targeted policy interventions. There is clear value in helping financially stressed individuals understand the root of their financial challenges and then providing them with advice (tailored to their specific circumstances) on the steps they may be able to take to change their circumstances and alleviate their financial stress.

In their research paper entitled The financial resilience and financial well-being of Canadians during the Covid-19 pandemic, Statistics Canada[7] notes: "As Canada begins the path to recovery from the health and economic impacts of the COVID-19 pandemic, there is a heightened awareness of the need for households to maintain or build their financial resilience. Global uncertainty, increasingly longer life spans, the changing nature of work, changing work-life patterns, housing affordability, high debt loads, and the impact of unplanned life events, amongst other factors, mean that many Canadians are needing to manage and, where possible, improve their financial resilience. The unprecedented situation brought on by the global pandemic has had significant economic impacts on most people in Canada, challenged the finances of many households and exacerbated inequalities that existed before the crisis. While some households have profited financially from the pandemic, others have experienced a considerable downturn."

---

[1] Canadian Payroll Association, *Nothing is Normal*, 2020

[2] Lifeworks, The Financial Wellbeing Index™ Report, 2021

[3] Metzler, Grace, and Zhou, *Learning About Financial Health in Canada*, 2021

[4] Manulife, 2016 Financial Wellness Index

[5] Metzler et al, 2021

[6] Department of Finance Canada, *Measuring what matters: Toward a Quality of Life Strategy for Canada*, 2021

[7] Statistics Canada, *The financial resilience and financial well-being of Canadians during the Covid-19 pandemic*, 2021

Another indication of the importance of financial well-being is an initiative by the Department of Finance entitled *Measuring What Matters*[8], released on April 19, 2021. It presents a Quality-of-Life Framework for Canada that includes five domains – Prosperity, Health, Society, Good Governance and the Environment – encircled by the ideals of Fairness and Inclusion and Sustainability and Resilience. The Prosperity domain includes a subdomain called "Economic Security and Deprivation" which includes the headline indicator "Financial Well-being."

Financial wellness and resiliency are complex topics that have not yet been thoroughly studied through a data driven, financial modelling inclusive lens. The research has been hampered in part by data inaccessibility since most data in this arena is proprietary and is sometimes analyzed with a particular agenda. The lab solves for these issues, as it encompasses a plethora of granular data sourced historically and, moving forward, in real time. With the assistance of machine learning, we will examine these data sources and look for subtle relationships and trends that have not been studied. The outcomes of this program will be financial insights and solutions deployed for the benefit of all Canadians and the country as a whole.

Illustration 1: Measuring What Matters, Department Of Finance Canada, April 2021

Income and Growth	Employment and Job Quality	Skills and Opportunity	Economic Security and Deprivation
• Household incomes • GDP per capita • Productivity • Access to broadband • **Household wealth** • Investment in R&D • Federal debt-to-GDP ratio • Firm growth	• **Employment** • Labour underutilization • **Wages** • **Precarious or gig work** • Job satisfaction	• Youth not in education, employment or training • Access to early learning and child care • Child, student and adult skills • Post-secondary attainment • Future outlook	• Acceptable housing • Poverty • Protection from income shocks • **Financial well-being** • Homelessness • Food security

Note: Bold highlights are the authors

[8] Department of Finance, Measuring What Matters, 2021

SECTION 3: DEFINING FINANCIAL WELLNESS

It's not clear when the term 'financial wellness' came into vogue but interest in the topic has tripled since 2014. Prior to 2012, there were minimal references to the term in the press although it was preceded by numerous investigations into financial literacy. Some of the earliest explorations of the topic by government and industry include the CFPB (2016), Manu (2016), Seymour Consulting (2017), LifeWorks (2019) and the Canadian Payroll Association (2010).

In addition to industry interest in the topic, a number of government agencies have invested in understanding financial wellness. In Canada, these agencies include the Financial Consumer Agency of Canada, the Department of Finance, Statistics Canada and the Bank of Canada.

Research by governments and industry into the topic generally starts with a proposed definition or model for financial wellness and then deploy surveys to test and inform the models.

On the academic side, Kempson, Finney and Poppe[9] from Oslo and Akerhaus University College of Applied Sciences stand out for their work on defining a model for financial well-being. Their research has been used and cited by agencies in Norway, the US, Australia, the UK and Canada.

Noteworthy Definitions of Financial Wellness

Kempson

"… the extent to which you can comfortably meet all of your current financial commitments and needs while also having the financial resilience to continue doing so in the future."

Consumer Financial Protection Bureau (CFPB)

"Financial Wellness is a state of being wherein a person can fully meet current and ongoing financial obligations, can feel secure in their financial future and is able to make choices that allow them to enjoy life."

Financial Consumer Agency of Canada (FCAC)

"Financial well-being is the extent to which you can comfortably meet all of your current financial commitments and needs while also having the financial resilience to continue doing so in the future. But it is not only about income. It is also about having control over your finances, being able to absorb a financial setback, being on track to meet your financial goals, and—perhaps most of all—having the financial freedom to make choices that allow you to enjoy life."

Noteworthy Models for Measuring Financial Wellness

Kempson et al. proposed a 4-part model for the key drivers for financial wellness. In their model, behaviours were identified as the main determinants of financial well-being. The four factors included:

[9] Kempson, Finney, Poppe, *Financial Well-being: a conceptual model and preliminary analysis.* 2017

- Socio-economic environment (or demographics - education, income and occupation, etc.)
- Knowledge, skills and experience (or financial literacy)
- Psychological factors (self-confidence, attitudes, locus of control, impulsivity, etc.)
- Behaviours – including planning, prioritizing, disciplined spending, not borrowing, active saving and information gathering.

In their regression testing on these factors, Kempson et al. identified three key behaviours that define financial wellness – **spending restraint, active saving and borrowing for daily expenses**. Their model presupposed that financial well-being was driven by five independent variables: financial behaviours; financial attitudes and confidence; financial knowledge and experience; personality traits; and aspects of the socio-economic environment. Then, in testing their model, they concluded that "the main direct effects on financial well-being are from the behaviours and aspects of the socio-economic environment. All other influences on financial well-being are primarily indirect and mediated through the behaviours. The behaviours are, in turn, driven by a combination of financial knowledge and experience, financial confidence and attitudes, personality traits and characteristics of the socio-economic environment. When other variables are controlled for in the model, the impact of knowledge and experience on the behaviours is weak relative to the other influences".

The Consumer Financial Protection Bureau (CFPB) also itemized four elements of financial well-being (in collaboration with Kempson et al.) - control over day-to-day finances, the freedom to make choices, capacity to absorb shocks, and if you are on track to meet your goals, along with seven influencers - social and economic environment; personality and attitude; decision context; knowledge and skills; behaviour; personal financial well-being; and available opportunities. Lifeworks uses a proprietary model that assumes the key components of financial wellness include knowledge, behaviours and perceptions. Seymour uses a framework that encompasses financial support, solutions and advice and Financial Resilience & Capability to create a Financial Resilience Index. Sub-components include knowledge and skills, confidence and behaviours. The Financial Consumer Agency of Canada (FCAC) determined financial well-being to encompass five components including economic factors, behaviour factors, psychological factors, knowledge and experience factors, and social factors.

All of the models noted above align with the lab's data driven conclusions (below), leading us to conclude we are hunting in the right forest – but we are not sure if we are on the right hill just yet. At the same time, the lab's analytics noted that we can't completely trust surveys and self-reported measures. For example, in the lab analysis of the CFPB data[10], we noted that one of the clusters was very confident in their financial capabilities but also had the weakest scores in an objective financial knowledge test. In that paper, we found that 1) financial knowledge is probably more important than it is often given credit for (in the academic literature) and 2) many existing scales that are used to measure financial well-being have considerable subjective components which has the potential to create a divide between financial well-being and true financial resilience (i.e. subjective component could artificially inflate the well-being score).

[10] Phelps and Metzler. "The effects of financial knowledge on financial well-being, behaviour and objective situation." 2021

Illustration 2: Financial Well-Being Research Summary (High Level)

Financial Well-being	Academic	Conceptual Models	Indices	Fin Wellness Lab
Researchers	• Barbic, Foerster, Kahneman, Thaler, Kempson, Metzler, Thompson, Knoll-Houts, Lusardi, Mitchell, Collins, Urban, Comerton-Forde, Metemery, Phelps	• Kempson, Melborne (academic) • CFPB, FCAC, FHN (gov't)	• LifeWorks (industry) • Seymour (industry) • Ceridian (industry)	• Consortium (academic, industry, gov't)
Methodologies	• Variety but largely stochastic	• Test (regression) the model thru surveys – panels, 5 countries & 6,000+ respondents per survey	• Quarterly surveys across 11,000 respondents, in 4 countries • Summarized into an index	• Clustering across 50,000 data points, 4 countries, 11 years
Framing	• Tends to be topical (e.g. retirement) or current issue (e.g. pandemic)	• Socio-economic, Knowledge & skills, Financial confidence, Psychological factors & Financial behaviours	• Financial knowledge, behaviour and perception (confidence)	• Not applicable – data driven
Findings (Drivers of Fin Wellbeing)		• 4 broad groups • Comfortable are minority • Savings, Emer. Fund, Debt, Income & Fin Literacy • **Factors are complex and overlapping** • **Self reported = Observed**	• 3 to 4 groups • Comfortable are minority • Savings, Emer. Fund, **Spending**, Debt, **Physical & Mental Hlth, Productivity**	• 3 groups • Comfortable are minority • Savings, Emer. Fund, Spending, Debt, **Housing, The Cliff, Advice** • **Self reported <u>not</u> = Observed**
Blind Spots	• Narrow and not holistic	• Self-reported data, Framing bias, Descriptive • Stress test/ externality • Advice, Insurance • Correlation vs Causation	• Self-reported data, Descriptive • Stress test/ externality • Advice, Social Network • Correlation vs Causation	• Data – integrity and coverage

SECTION 4: RESEARCH METHODOLOGIES

The Academic Literature

The academic investigation of financial wellness has been largely restricted to a relatively niche area of the social sciences that has not made full use of recent advances in mathematical modelling or machine learning. Much of the research has been disparate, with scholars pursuing specific questions and theories in isolation of a larger context. Regardless, there is a significant body of literature (see Section 5) that can be drawn upon for the lab's purposes. In general, the topics of spending, literacy, behaviour and demographics are thoroughly researched. Savings research tends to focus on investments, pensions and portfolios. Debt and income research is surprisingly sparse.

Some academic work exists on modelling – prescriptive solutions to optimize outcomes for stylized households, for example. The existing empirical models for household wealth accumulation provide prescriptions for savings rates and investment allocations as a function of individual risk aversion and financial goals. The models are stochastic to incorporate both uncertain market returns (quantitative finance) and income/consumption shocks (actuarial analysis). Key drivers include the links between income-consumption, savings rate, risk attitudes, and the response to unforeseen shocks. The weakness in these models is the lack of ground-truthing to objective real-world data.

Industry & Government Surveys and Indices

For the most part, analysis of the survey results has relied on standard statistical concepts and tools- including weighted averages, mean, standard deviation and T-test. Some have emphasized regression models. None, to our knowledge, have used machine learning techniques.

At The Lab

The lab's partnership is uniquely positioned to contribute to these important research themes and their associated objectives. We plan to start by applying proven methodologies to new datasets and then by using emerging technologies with the data. The findings from these scientific techniques will be contextualized within the realities of 2021 and Canada – both of which are poorly covered by current literature.

For the lab's empirical work, we will be using a spectrum of datasets that encompass millions of data points for hundreds of thousands of working Canadians. Through the data, we develop data-driven analytic techniques that allow us to identify complex relationships in variables from large datasets – starting with attributes associated with their employment, gender, age, etc. and moving downstream to deductions from income (taxes, saving rates, benefits, etc.). We use advanced data analytics techniques which will allow us to identify non-linear, complex interactions. More specifically (or technically) we will conduct a suite of advanced clustering (k-means, k-prototypes and PAM) and t-stochastic neighbour embedding visualization (principal components, t-SNE) techniques suited to specific data types. While stylized prescriptive models of household wealth accumulation are well established (e.g., Merton, 1992), the ability to add a descriptive element to these models via ground-truthing data is limited. Existing literature often relies on self-reported survey data collected at a single time, whereas the data provided by the lab's partners spans many years and contains detailed objective information on such things as income levels, savings habits and investment decisions, and demographic information such as age, marital status, number of dependents and full or part-time employment status.

Illustration 3: Top 9 Cluster Determinant Features

- If your paycheque was delayed for a week, how difficult would it be to meet your current financial obligations?
- How likely are you to come up with $2,000 if an emergency arose within the next month?
- In the past year I have used debt, such as a line of credit, to pay for essentials such as food, clothing or shelter.
- How likely are you to come up with $20,000 if an emergency arose within the next month?
- Stress related to personal finances has had an impact on my workplace performance.
- If you were looking for a new job, which of the following would be the most important to you?
- I feel overwhelmed by my debt.
- On average, what percentage of your pay cheque do you put toward savings?
- What is your primary financial goal at the current time?

Lab Datasets Examined To Date

Investment transaction datasets:

Data Tables	Know Your Clients (KYC)	Trade	Position	Commission
Accounts	80,139	63,966	58,979	75,031
Clients	31,664	36,800	30,830	41,412
Time range	2019-07-15 to 2021-02-19	2019-07-15 to 2021-02-19	2019-07-15 to 2021-02-19	2019-07-15 to 2021-02-19
Records	29,131,279	543,482	98,295,268	4,024,265
Variables	26	18	15	15

Summary of survey datasets:

Dataset	Year(s) of Data Collection	Number of Respondents*	Number of Variables per Respondent (Involved in Clustering)**	Loca-tion/ Residence of Respondents
FCAC 2019 Financial Capability Survey	2019	7,169	In progress	Canada
FCAC Financial Well-being Survey	Aug 20-May 21	9,394	In Progress	Canada
Lifeworks Financial Wellbeing Index	2021	11,000	17	Australia, Canada, UK & USA
CPA	2009-2021	49,985	59-226 (15-19)	Canada
Ceridian On Demand Pay	2019	713	96 (19)	Primarily USA, some EU
Ceridian State of Pay	2019	3,855	182 (46)	Canada, USA, UK, Australia
CFPB	2016	6,394	215 (3)	USA

*The number of variables is inflated because some questions were asked slightly differently depending on the location (e.g., Canada vs USA). In addition, some of the variables are dummy variables. For example, if a person was asked for their highest level of education their response might be encoded as a yes/no for high school, some college, college, a four-year degree, and a graduate degree.

**The datasets exclude the Lifeworks Financial Wellness Index analysis completed by Lifeworks staff, in collaboration with the lab's researchers.

SECTION 5: THE EMERGING CONCLUSIONS (NOVEMBER 2021)

When combined, the academic literature, the industry surveys, government research and the lab's preliminary analysis start to paint a picture of a challenging landscape. Six themes appear to be developing – but they are often deeply entwined and it is not yet clear which themes would be considered the 'drivers' of financial wellness versus secondary influencers.

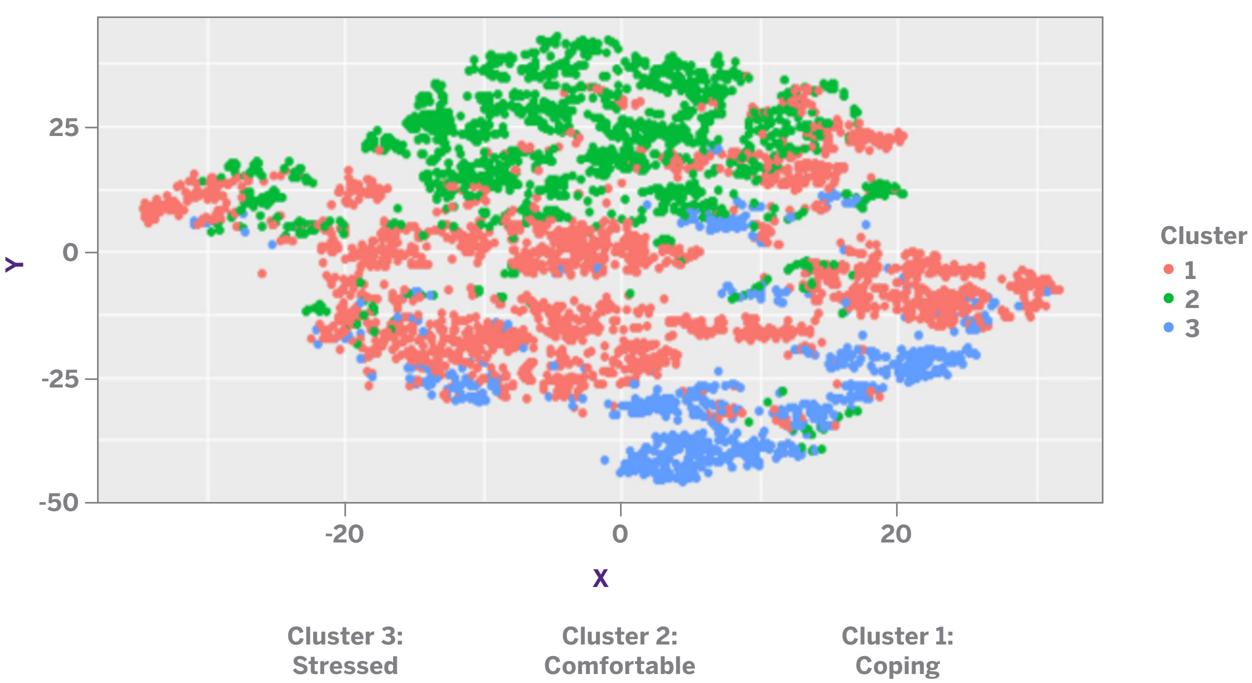
The Three Solitudes

"Despite positive financial health trends at the national level, the majority of people in America are still not financially healthy." Financial Health Network

"Close to seven in ten Canadian households show indications of financial vulnerability on some level." Statistics Canada

Virtually all of the studies referenced in this paper conclude that there are three groups of households within the financial wellness spectrum. We broadly describe them as financially "comfortable," financially "coping" and financially "stressed". In the lab analysis, the clustering algorithms consistently note two to four clusters (see Illustration 4 for an example) as optimal – across time frames and across countries.

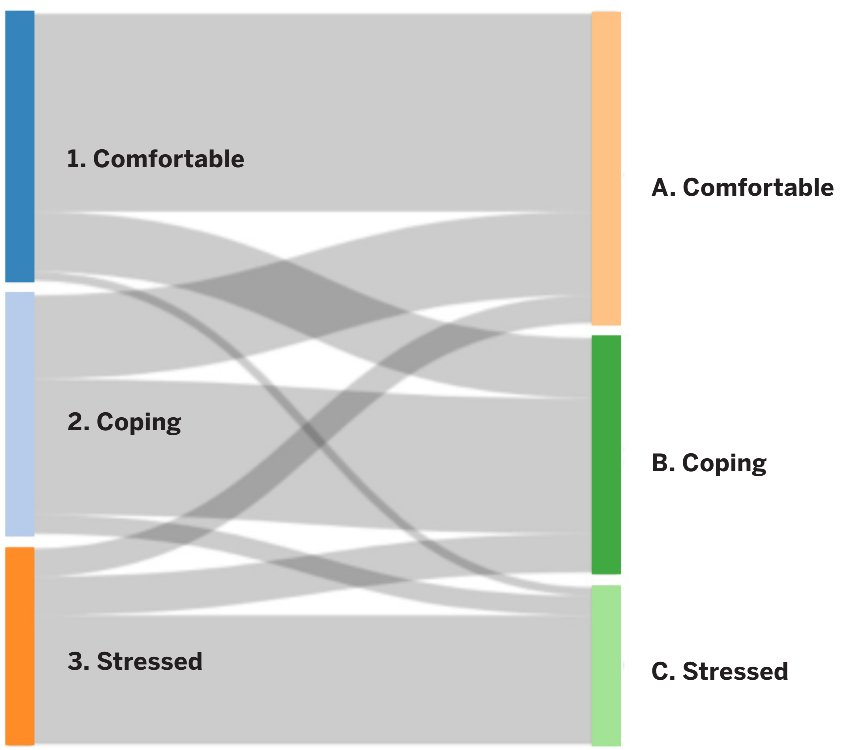
Illustration 4: Clustering Example (CPA, 2019)



Of particular note is the prevalence of financial fragility. All of the studies consistently note that the financially comfortable group are a minority – roughly one-quarter to one-third of the total households. The observation is important because financial stress is tightly entwined with physical and mental health and flows downstream to productivity, absenteeism and presenteeism issues. If two-thirds of the working population are 'struggling,' it doesn't appear to set the stage for a financially resilient society or economy.

We also noted that while the gap between the Comfortable and Coping clusters is significant, the gap between Coping and Stressed has become a chasm. For example, in the 2021 CPA data on debt, the gap between Coping and Stressed was 6.5x wider than the gap between Comfortable and Coping. Similarly, Statistics Canada noted a 'financial resilience gap' in their September 2021 report. The good news is that the movement between clusters isn't one-way. We can point to examples of respondents who moved from Stressed to Coping or Comfortable between 2020 and 2021 (see Illustration 5).

Illustration 5: Cluster Migration from 2020 to 2021



To make matters more complicated, there is an established and researched link between mental, physical and financial well-being suggesting that solutions to bridge the three solitudes will need to be multi-disciplinary in order to be effective and sustainable.

The Three Sisters – Savings, Spending and Debt

A recurring theme throughout the industry studies and the lab's analysis is that savings, spending and debt play uniquely powerful roles in financial resilience. The lab's analysis to date has concluded that each is a determining factor in the lab's clustering algorithms. The challenge with that statement is that the three variables are interconnected to each other – income minus spending equals savings and if savings are negative, households often turn to debt. It is therefore dangerous to investigate each in isolation of the others. Any definitive conclusions will need to be in context. Still, each factor does have some unique characteristics worth mentioning.

Savings And An Emergency Account

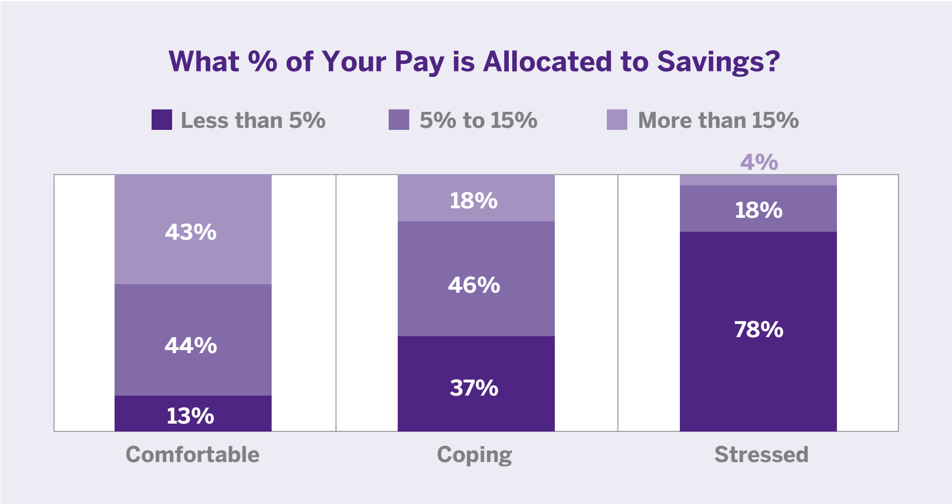
"Savings and financial cushions provide the greatest differentiation between people with different levels of financial well-being." CFPB

"24% of households reported a liquid savings buffer of three weeks or less while 32.9% had a negative or zero household savings rate." Statistics Canada

All of the industry reports we've examined draw a strong and direct link between savings rates and the financial health of a household. Several note an emergency account as particularly important to financial resilience. It makes intuitive sense that when confronted with an unexpected shortfall in cash, a reserve or cushion is invaluable. Statistics Canada feels strongly enough about household savings rates to track them on a quarterly basis and economists regularly point to household savings rates as an indicator of a healthy economy.

The lab analysis has reinforced this conclusion. Of the 200+ variables used in the clustering, three of the top nine are related to savings (see Illustration 3). Academically, some research has been conducted on household savings rates but it is largely either theoretical modeling or looks at specific savings issues,for example retirement.

Illustration 6: Example Of Savings Patterns By Cluster



Blind Spots [11]

- Savings are only one option if a household has a cash shortfall or unexpected expense. Debt, social capital (friends and family) and insurance also need to be examined, as does the decision-making process when weighing each of the options.
- An empirical examination of savings patterns is difficult since most objective data pools are private or proprietary. Confidentiality and privacy need to be paramount when examining these datasets.
- "Savings" is a broad term for a number of vehicles – each of which have their own characteristics. For example, saving for retirement, your children's education, a down payment on a home or a vacation can all look very different. And most households don't pursue one to the exclusion of the others – they need to be considered separately and in aggregate.
- To be effective on the shop floor, solutions need to be much more than descriptive – "You need to save."They also need to be prescriptive – "Given your circumstances and your goals, we recommend you save 2.3% of your income in a Balanced Fund within your company's defined contribution plan."

Debt And Borrowing

"Canadians who avoid borrowing to meet daily expenses have higher levels of financial well-being than those who borrow regularly, regardless of income." FCAC

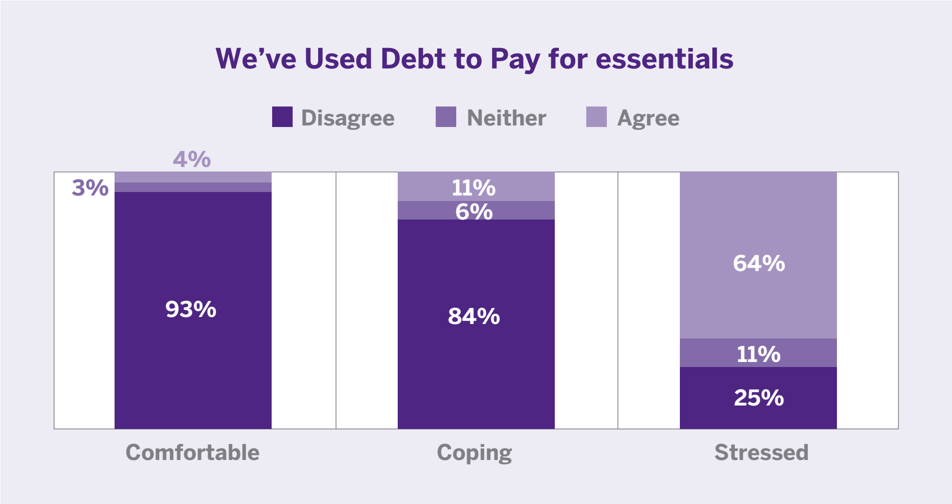
Like savings, all of the industry reports we've examined draw a strong inverse link between debt and the financial health of a household. And again, Statistics Canada feels strongly enough about the issue to track it on a quarterly basis.

At the lab, our algorithms consistently note that the Financially Stressed group is largely defined by their debt – the amount of debt, how they use it, the type of debt and the stress associated with it. The gap between the Comfortable and Stressed clusters on this issue is dramatic. In the lab's analysis with one of our partners, we noted that the use of payday loans is strongly associated with the stressed cluster.

Academically, very little research has been conducted on household debt beyond its macro-economic implications.

[11] Blind Spots refer to areas not currently included withing the labs research plans or areas where we may not have the data necessary for our analysis. In Section 6 we address the action necessary to address the Blind Spot.

Illustration 7: Example of Clusters Features for Debt



Blind Spots

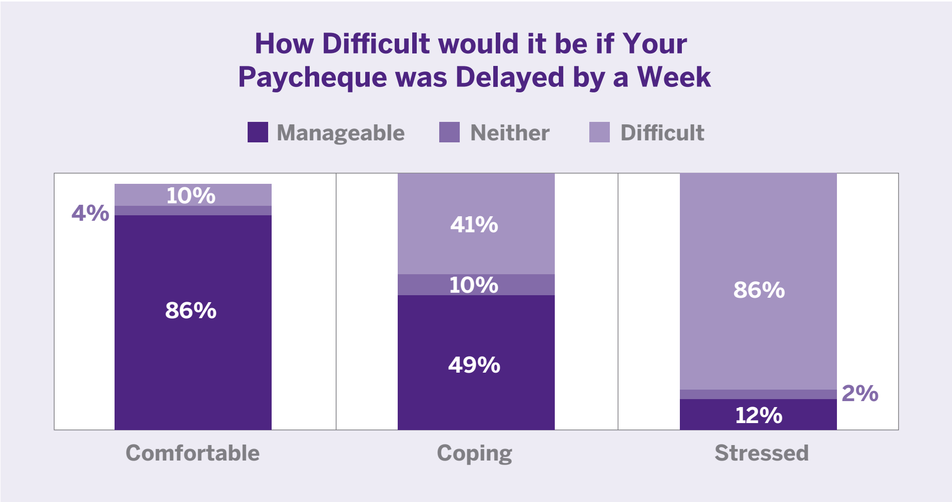
- Like savings, debt needs to be separated into 'type.' There are significant differences and implications between a mortgage (used to finance the family home) and a payday loan (with high interest rates, high fees and punitive conditions).
- At this point, we don't have the granular data necessary to fully explore the role debt plays in financial well-being.

Spending

"Budgeting is crucial for many Canadians in managing their day-to-day finances..." FCAC

Industry and government research notes a strong link between spending patterns and the financial health of a household. Planning or budgeting are also noted in some studies (although not all; see Metzler et al., 2021) and we have included these topics here,as a subset of 'spending'. At the lab, spending also jumped out as a key determinant but we noted that income, debt, housing and spending behaviours are all deeply entwined. Intuitively we know that income, spending and savings are integrated. The lab analysis has noted that spending your entire paycheque, using debt to pay for essentials and finding it very difficult if your paycheque was delayed for a week represent three of the top 10 features in the clustering.

Illustration 8: Example of Clusters Features for Spending



Of particular note in the 2021 Canadian data is housing affordability (and its associated debt). Even amongst the Comfortable cluster, 29% are concerned about their debt load and 23% are spending more on housing than the CMHC recommended thresholds – and this while interest rates are at historic lows. It should be noted that homeownership per se did not define the clusters[12]. The majority of respondents in all three clusters are homeowners (83% of Comfortable are homeowners, 73% of Coping and 61% of Stressed). But the percentage of monthly income consumed by housing costs (including the mortgage) differs greatly. 58% of Comfortable spend less than 30% of monthly income on housing costs while 66% of Stressed are spending more than 40% on housing costs. 39% of all respondents are spending more than 40% on monthly income on housing! CMHC considers 39% to be the threshold for mortgage approval. The financially Stressed group are much more likely to believe that housing costs are unaffordable and to express concern with their overall debt load.

Blind Spots

- Ruin Theory has been widely used in insurance to examine two opposing cash flows: steady incoming cash and intermittent or random outgoing. We are not aware of academic research that has applied the same techniques when examining household cash flows.
- An empirical examination of spending patterns is difficult as most objective data pools are private or proprietary. Confidentiality and privacy need to be paramount when examining these datasets.
- The lab datasets do not include extensive or granular data on household spending.
- To be effective on the shop floor, solutions need to be much more than descriptive – for example, "You need manage your spending." They also need to be prescriptive – for example, "Given your circumstances and your goals, we recommend you reduce your spending by 12% by eliminating one of your automobiles."

[12] It should also be noted that it is not clear from the survey if respondents interpreted household income to mean net income (after taxes or gross income (before taxes).

Income – The Elephant in the Room

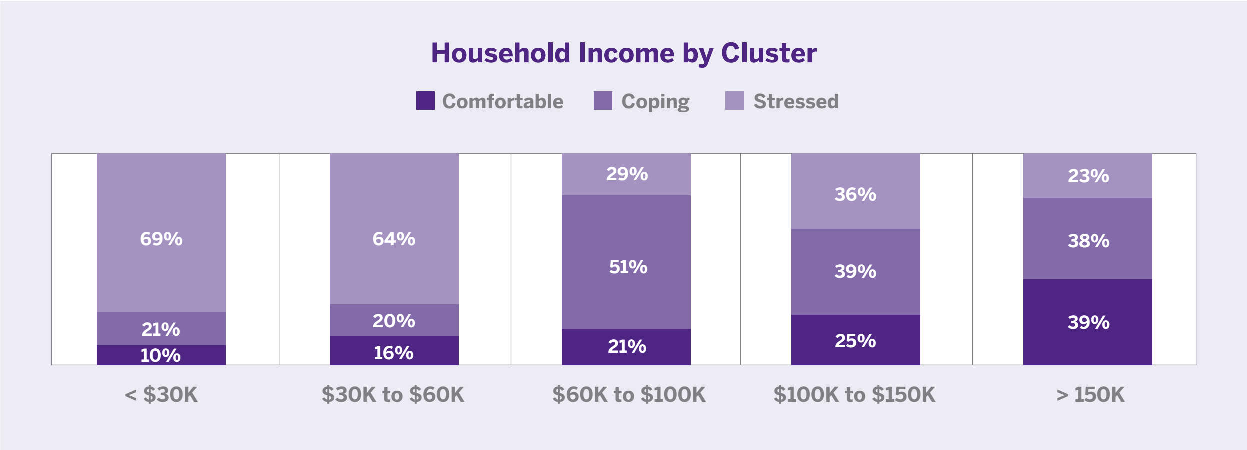
"Canadians from all income demographics can fall into any one of the Financial Resilience segments." Seymour[13]

Most of the survey-based research notes a relationship between income and financial wellness but some also go on to note that income doesn't have a causal relationship.

At the lab, we've determined that income is one of many features of financial well-being, but income alone does not determine your location on the well-being spectrum (i.e. it matters, but doesn't tell the whole story)[14]. There was a significant number of both high- and low-income households in all three clusters (see Illustration 9 for an example). And it is the stressed cluster that tends to view income as the source of – and solution for - their challenges.

In one of our analyses[15], we determined that pay frequency also appears to play a role. To our surprise, it appears the stressed cluster is likely to be paid more frequently. However the work in this area is preliminary and further work is required to determine the exact nature of the frequency/stress relationship.

Illustration 9: Cluster Membership by Household Income



Blind Spots

- Much like savings and debt, income isn't a one size fits all scenario. It will be important to break income into categories such as salaried, hourly, variable, seasonal and gig to see if some forms of income contribute or detract more strongly than others to financial resiliency.

[13] Seymour Financial Resilience Index, Seymore Consulting

[14] Phelps and Metzler, 2021

[15] Ceridian On Demand Pay Study, 2019

Literacy Or Behaviour?

"Higher levels of financial know-how, confidence and certain day-to-day money management behaviors appear to have strong and positive relationship with financial well-being ". CFPB

"Financial well-being has a stronger relation to behaviours than to economic factors." FCAC

Financial literacy became a popular term in 1914. Since then a significant amount of resources have been invested in financial literacy on the assumption that "knowledge" played a defining role in financial wellness. In Canada, November has been declared financial literacy month and organizations such as the Chartered Professional Accountants Canada support a number of initiatives in support of financial literacy. The US, Canada, UK, Australia, New Zealand and Denmark all have national financial literacy or financial capability strategies. It is unlikely that our lab can make a significant and incremental impact on the topic of literacy but should be able to help support those leaders.

However, some of the more recent research has concluded that while literacy is important, financial behaviours are a far more dominant factor in financial well-being. At the lab, some of our early analysis has concluded that there is an inverse relationship between knowledge and well-being – some households with the highest confidence in their well-being tested quite poorly on their literacy[16].

In their new National Financial Literacy Strategy, the FCAC has adopted the approach that effective solutions are required across the breadth of the financial ecosystem. There were six priority areas identified in the National Strategy which will reduce barriers and catalyze action to enable consumers to build the skills, capacity and behaviours that will lead to greater financial resilience including communicating in ways people understand, providing for diverse needs, supporting digital access and digital literacy, enhancing access to advice, using behavioural design to simplify decisions and strengthening consumer protection measures.

Blind Spots

- Many of our conclusions point to behavioural solutions. We need to integrate behavioural experts into our research.
- In particular, client-facing solutions will benefit from a behavioural perspective (see Living Lab).

The Role of Advice

"Advised households saved at twice the rate of non-advised households." CIRANO

Studies within the financial wellness sphere have generally ignored the impact of advice on financial wellness. Most appear to assume that 'households' make their financial decisions in a vacuum. The FCAC's 2021 National Financial Literacy Strategy mentions enhancing access to trustworthy and affordable financial help in their call to action but there is little mention in the other literature we've examined. This is surprising given the size and breadth of the financial advice industry in Canada (in excess of 100,000 'advisors').

[16] Phelps e al

In a study completed in 2012 by the Center for Interuniversity Research and Analysis (CIRANO), the authors noted that households that use financial advisors had two to three times more wealth than non-advised households – after all other observable differences were controlled. Most importantly for us, they attributed the difference to savings.

Other research has gone on to conclude that behavioural coaching – especially during challenging financial situations - leads to improved investment outcomes and the attainment of financial goals (i.e. resiliency). The value of this advice also included a sense of financial well-being achieved through behavioural coaching. Studies by Vanguard have concluded that behavioural coaching adds 1.5% (of managed assets) and spending strategies add another 1.1% of the total 3.0% in total value delivered by advisors. Russell Investments estimate the value delivered by advisors as primarily derived from active portfolio rebalancing, behavioural coaching, personalized advice, product alignment and tax optimization.

In their 2017 research, Foerster et al. argued that advisors provided only minimal personalization in their advice. "The most striking finding from our analysis of portfolio allocations, however, is that clients' observable characteristics jointly explain only 12% of the cross-sectional variation in risky share."

In contrast, our research thus far (using different techniques from Foerster et al.) has concluded that advisors manage portfolios consistent with the client's suitability and that the advice is customized to their client's unique needs. We also found that advisors are systemically safe and conservative in their advice and therefore appear to mitigate exposure to undue risk.

Perhaps one of the reasons for a hesitancy to embrace advice with respect to financial wellness is the growing evidence that financial, physical and mental wellness are deeply integrated. At present, each of those domains often exists within its own silo and a competency in one does not imply competencies in the other. A professional advisor would therefore hesitate to pursue guidance where they don't feel qualified.

Blind Spots

- More empirical work needs to be done to confirm the value derived from advice with respect to behaviour. The two studies noted above (Vanguard and Russell) have the potential for bias given each organization's strong relationship with advisors.
- Given the inter-relationship between the factors, more work needs to be done on the impact of holistic advice and the role advice plays in physical and mental health. Could or should advice look more like "counseling"?
- On a related note, there are structural challenges unique to Canada's system of regulatory silos that preclude financial advisors from looking at the big picture (holistic) and there is little monetary incentive to provide advice in the workplace.
- While our research has concluded that financial advisors manage risk, we need to follow through on the examination of returns – the two go hand in hand. For example, for clients seeking to preserve capital, the focus on risk is good news, but clients seeking to maximize growth may not be exposed to enough risk to achieve their expressed goals.

Personalization

"Renters, women, part-time workers and underemployed are more likely to be Extremely Vulnerable and Financially Vulnerable, amongst other populations." Seymour

All the studies note a tendency for demographic or socio-economic factors to be correlated to financial wellness. Income, employment, regionality, age and gender are all mentioned as influencers in the studies. In their September 2021 report, Statistics Canada drew a link between financial wellness and demographics, household resources, age, life trajectory, immigration and minority groups and Lifeworks has noted a relationship between financial wellness and households with children.

At the lab, we've found that demographics play a role but the role appears to be secondary effect when compared to debt, spending and behaviour. In particular, our analytics[17] were indifferent with respect to geography and gender, and only weakly related to age (younger respondents are marginally more likely to be classified as stressed, but half of the stressed group is over the age of 40 and a quarter is over the age of 50). Low household income does increase the risk of financial stress but does not guarantee it (roughly half of those with household incomes below $50,000 are classified as stressed, whereas a fifth are classified as comfortable) and those with high household incomes are not immune from financial stress (although half of those with household incomes above $150,000 are classified as comfortable, a fifth are classified as stressed).

On the investment side, our findings challenge some of the widely held assumptions in the financial advice industry regarding risk tolerance and trading behaviour. For example, the assumption that risk tolerance is, or should be, driven by age, gender or income. We found that none of these factors played a significant role in our clustering. Instead, the clusters were determined by trading behaviour and we assume those trading behaviours were driven in turn by investor preferences [18].

Blind Spots

- All three of the lab's clusters have significant representation across income, genders, marital status, age, and geography – leading us to hypothesize that the factors at play are far too complex to be solved by macro-themes or narrow economic solutions (e.g. give everyone a raise). It's becoming apparent that we may need to look at hyper-personalization and how to craft prescriptions unique to each household and financial issue.

[17] Metzler et al

[18] Thompson, Feng, Grace and Ressor, Know your clients' behaviours, 2021.

SECTION 6: WHERE TO NOW?

Business as Usual

Empirical, data driven research is dependent on our data. Our current data allows us to confidently research four broad areas:

- **Savings Patterns:** We plan to examine savings patterns and how these patterns contribute to financial resiliency. We will focus on the sequential patterns of savings using real world observations and in the context of realities such as low interest rates, volatile markets and unexpected shocks.
- **Income Resiliency:** We plan to examine how household income contributes to financial resiliency and in particular how the characteristics of income (level, interruption, sustainability, etc.) empirically impact household behaviours with respect to savings patterns, investment trades, risk and return. Income resiliency has a direct impact on savings patterns but it also dictates other cash flow issues. Financial resiliency is compromised when the timing of cash inflows does not match cash outflows and inadequate financial buffers are in place.
- **Investment Risk and Return:** We are examining the three cornerstones of personal financial risk – capacity, tolerance and required - to assess empirically how Canadians approach risk and whether their choices contribute or detract from financial resiliency.
- **Protection and Security:** We plan to examine how participation in employer sponsored benefits programs contributes to financial resiliency. Employee benefits plans can cost employers and employees together the equivalent of 30% to 40% of cash compensation. Participation and utilization of these plans have a material impact on financial resiliency and we will look at how benefits plans contribute to savings outcomes, the perception of risk and income resiliency.

Within each of these areas, we are positioned to empirically measure the patterns, determine the impact of specific behaviours or decisions, determine the probability of each pattern and craft a prescription to favour 'good' outcomes over 'bad' outcomes. Work is already underway in each of these areas and should continue as planned.

New Data

On the basis of the blind spots revealed in Section 5, there are six areas that are not included in our current plans but should be.

1. We need to examine **spending patterns** in more detail. Access to spending data should be a priority for the lab.
2. We need to examine **debt and borrowing patterns** in more detail and therefore access to debt data should be another lab priority. If the spending data noted above also included debt payments, we may be able consolidate our outreach.
3. Our datasets would benefit from additional **savings data** where households have savings that are neither with an advisor nor assembled via payroll deduction (i.e. from financial institutions such as banks).

4. We should examine the unique role **housing costs** plays in financial well-being.
5. We should pursue **objective data vs self-reported data** where possible.
6. As we pursue data, and possibly collaborators, we should be mindful of access to apps and other **Fintech solutions** that could identify how consumers engage with financial services and their savings and investment patterns in real time.

New Partners

And we may need more research partners.

- The lab's core competency does not include economics nor does it aspire to become an economics lab. However some of our conclusions may point to macro-economic solutions and we may need to engage and collaborate with economists or policy experts.

Living Lab

Our "Living Lab" will need a unique mandate.

The *Living Lab* is intended to bridge the research findings to client facing solutions (from the chalkboards to the floorboards). We plan to engage the researchers and partners in design thinking workshops with the goal of identifying working prototypes that can be tested on industry platforms. Successful prototypes can then be swiftly identified and passed to industry for development at scale.

- Client-facing solutions will benefit from a behavioural perspective and our solutions need to be more holistic and all encompassing – we will need to deploy design thinking and customer journeys in our solutioning. These are not currently core competencies within the lab.
- Many, even most, of our conclusions point to behavioural solutions. We will need to integrate behavioural insights/expertise into our solutions.
- The *Living Lab* is specifically focused on generating prescriptive solutions rather than research per se. It therefore requires a separate mandate and possibly separate funding.
- We will need to engage partners with unique expertise if our solutions interact with EDI communities such as immigrants, persons with disabilities, indigenous, elderly, etc.

SECTION 7: REFERENCES & SOURCES

Financial Well-being

- Bruggen, E, Hogreve, J, Holmlund, M, Kabadayi S, Lofgren, M. *Financial well-being: A conceptualization and research agenda*. Journal of Business Research. March 2017.
- Canadian Payroll Association. *Nothing Is Normal – Canadian Workers Are Overwhelmed by Uncertainty*. 2020.
- Department of Finance Canada. *Measuring What Matters: Toward a Quality-of-Life Strategy for Canada*. Available at: https://www.canada.ca/en/department-finance/services/publications/measuring-what-matters-toward-quality-life-strategy-canada.html, April 2021.
- Financial Consumer Agency of Canada, *Why your employee's financial well-being matters*, 2020.
- Fujiki, H. *Household financial services, financial literacy, and COVID-19 pandemic. Applied Economics Letters*, 1-4. 2021.
- Gerrans, P., Speelman, C., & Campitelli, G. *The Relationship Between Personal Financial Wellness and Financial Wellbeing: A Structural Equation Modelling Approach*. Journal of Family and Economic Issues, 35(2), 145–160. 2014.
- Hayes, Evans and Finney. *Momentum Household Financial Wellness Index: Wave One*. Personal Finance Research Centre (University of Bristol) Report. 2016.
- Kempson, E., Finney, A. and Poppe, C. *Financial well-being: a conceptual model and preliminary analysis*. Project Note 3-2017, Consumption Research Norway-SIFO (Oslo and Akershus University College of Applied Sciences). 2017.
- Kempson, E., Finney, A. and Poppe, C. *Financial well-being: a revised model and comprehensive analysis*. Project Note 3-2018, Consumption Research Norway-SIFO (Oslo and Akershus University College of Applied Sciences). 2018
- Lifeworks, *The Financial Well-being Index™ Report*, 2021
- Metzler, A., Grace, C. and Zhou, Y. *Learning About Financial Health in Canada*. Quantitative Finance and Economics, 5(3): 542-570. 2021.
- *Seymour Financial Resilience Index™* and Applications Release, issued by Seymour Consulting
- Vlaev, Ivo and Antony Elliot. *Financial well-being components*. Social Indicators Research, 118(3):1103-1123. 2014.
- Phelps, N. and A. Metzler (2021). "The effects of financial knowledge on financial well-being, behaviour and objective situation." Submitted, *Journal of Empirical Finance*.

Savings

- Bank of Canada, *Financial System Review*. https://www.bankofcanada.ca/wp-content/uploads/2017/06/fsr-june2017.pdf. 2017.
- Bayraktar, E., & Zhang, Y. *Minimizing the Probability of Lifetime Ruin Under Ambiguity Aversion*. SIAM Journal on Control and Optimization, 53(1), 58-90. 2015.
- Bayrakter, E., & Young, V. *Optimal Investment Strategy to Minimize Occupation Time*. Annals of Operations Research, 176 (1), 389-408. 2010.

- Baldwin, B. *The Economic Impact on Plan Members of the Shift from Defined Benefit to Defined Contribution in Workplace Pension Plans*. Canadian Lab. & Emp. LJ, 19, 23. 2015.
- Bodie, Z., Marcus, A. J., & Merton, R. C. *Defined benefit versus defined contribution pension plans: What are the real trade-offs?. In Pensions in the US Economy* (pp. 139-162). University of Chicago Press. 1988.
- Blake, D., Wright, D., & Zhang, Y. *Target-driven investing: Optimal investment strategies in defined contribution pension plans under loss aversion*. Journal of Economic Dynamics and Control, *37*(1), 195-209. 2013.
- Broadbent, J., Palumbo, M., & Woodman, E. (2006). *The shift from defined benefit to defined contribution pension plans–implications for asset allocation and risk management*. Reserve Bank of Australia, Board of Governors of the Federal Reserve System and Bank of Canada, 1-54. 2006.
- Brown, R. L., & Liu, J. (2001). *The Shift to Defined Contribution Pension Plans: Why Did It Not Happen in Canada?*. North American Actuarial Journal, *5*(3), 65-77. 2001.
- Byrne, A. (2007). *Employee saving and investment decisions in defined contribution pension plans: survey evidence from the UK*. Financial Services Review, *16*(1). 2007.
- Cadman, B., & Vincent, L. *The role of defined benefit pension plans in executive compensation. European Accounting Review*, *24*(4), 779-800. 2015.
- Messacar and Morisette. Government of Canada. *Employer pensions and the wealth of Canadian families*, 2015,
- Thompson, J.R.J., and Davison, M. *Classifying trading behaviour in unrealized portfolio returns using functional principal component analysis*. Working paper, 2021

Debt

- Lowe, P. *Household debt, housing prices and resilience*. Economic Analysis and Policy, 55, 124-131. 2017.

Spending

- Ameriks, J., Caplin, A., & Leahy, J. *Wealth accumulation and the propensity to plan*. The Quarterly Journal of Economics, *118*(3), 1007-1047. 2003.
- Attanasio, O. P., Banks, J., Meghir, C., & Weber, G.. *Humps and bumps in lifetime consumption*. Journal of Business & Economic Statistics, *17*(1), 22-35. 1999.
- Lynch Jr, J. G., Netemeyer, R. G., Spiller, S. A., & Zammit, A. *A generalizable scale of propensity to plan: The long and the short of planning for time and for money*. Journal of consumer research, *37*(1), 108-128. 2010
- Lee, J. M., & Kim, K. T. *The role of propensity to plan on retirement savings and asset accumulation*. Family and Consumer Sciences Research Journal, *45*(1), 34-48. 2016.

Income

- Barnhart, Brennan, Kimberley Beck, Wesley Benjamin, Chris Birrell, Samir Djidel, Andrew Heisz, and Eric Olson. Statistics Canada. *Experimental estimates of family weekly income, update*. Available at: https://www150.statcan.gc.ca/n1/en/catalogue/75F0002M2021002. 2021.

- Barnhart, Brennan, Kimberley Beck, Wesley Benjamin, Chris Birrell, Samir Djidel, Andrew Heisz, and Eric Olson. Statistics Canada. *Experimental estimates of family weekly income, January 2020 to March 2021*. Available at: https://www150.statcan.gc.ca/n1/en/catalogue/75F0002M2021006. 2021

Knowledge and Literacy

- Barbić, D., Palić, I., & Bahovec, V. *Logistic regression analysis of financial literacy implications for retirement planning in Croatia*. Croatian Operational Research Review, *7*(2), 319-331. 2016.
- Bahovec, V., Barbić, D., & Palić, I. *Testing the effects of financial literacy on debt behavior of financial consumers using multivariate analysis methods*. Croatian Operational Research Review, 361-371. 2015.
- Behrman, J. R., Mitchell, O. S., Soo, C. K., & Bravo, D. *How financial literacy affects household wealth accumulation*. American Economic Review, *102*(3), 300-304. 2012.
- Calvet, L. E., Campbell, J. Y., & Sodini, P. *Measuring the financial sophistication of households*. American Economic Review, *99*(2), 393-98. 2009.
- Fernandes, D., Lynch Jr, J. G., & Netemeyer, R. G. *Financial literacy, financial education, and downstream financial behaviors*. Management Science, *60*(8), 1861-1883. 2014.
- Gustman, A. L., Steinmeier, T. L., & Tabatabai, N. *Financial knowledge and financial literacy at the household level*. American Economic Review, *102*(3), 309-13. 2012.
- Hassan, N. M., Kassim, E. S., & Ma'on, S. N. *Factors Influencing Individual Financial Resilience in facing Economic Crisis: Does Financial Literacy really help?*. International Journal of Academic Research in Business and Social Sciences, *8*(11). 2018.
- Klapper, L., & Lusardi, A. (2020). *Financial literacy and financial resilience: Evidence from around the world*. Financial Management, *49*(3), 589-614. 2020.
- Lusardi, A., Hasler, A., & Yakoboski, P. J. (2020). *Building up financial literacy and financial resilience*. Mind & Society, 1-7.
- Lusardi, A., & Mitchell, O. S. *Financial literacy and retirement planning in the United States* (No. w17108). National Bureau of Economic Research. 2011.
- Nielsen, Fletcher and Batholomae. *Consumer Finances of Low-Income Families*. In Handbook of Consumer Finance Research, Xiao J. (ed). 2016.
- Phelps, N. and A. Metzler. *The effects of financial knowledge on financial well-being, behaviour and objective situation*. Submitted, Journal of Empirical Finance. 2021.
- Prawitz, A and Cohart J. *Financial management competency, financial resources, locus of control and financial wellness*. Journal of Financial Planning and Counselling, 27(12): 142-157. 2016.
- Smith, J. P., McArdle, J. J., & Willis, R. *Financial decision making and cognition in a family context*. The Economic Journal, *120*(548), F363-F380. 2010.
- Stolper, O. A., & Walter, A. *Financial literacy, financial advice, and financial behavior*. Journal of Business Economics, *87*(5), 581-643. 2017.

Behaviour

- Behavioural Insights: Key Concepts, Applications and Regulatory Considerations, Ontario Securities Commission
- Johnston, D. W., Kassenboehmer, S. C., & Shields, M. A. *Financial decision-making in the household: Exploring the importance of survey respondent, health, cognitive ability and personality.* Journal of Economic Behavior & Organization, *132*, 42-61. 2016.
- Kahneman, *The Human Side of Decision Making: Thinking Things Through with Daniel Kahneman, PhD*, Journal of Investment Consulting 13, no. 1, (2012): 5–14. 2012.
- Thaler, *Misbehaving: The Making of Behavioural Economics*. New York: W.W. Norton & Company. 2015.

Demographics

- DeVaney. *Financial Issues of Older Adults*. In Handbook of Consumer Finance Research. 2016.
- Dodini, S., Larrimore, J., & Thomas, L. (2016). *Report on the Economic Well-Being of US Households in 2015*. Reports and Studies, 164-164. 2015.
- Loibl and Hira. *Financial Issues of Women. In Handbook of Consumer Finance Research*. 2016.
- Schubert, R., Brown, M., Gysler, M., & Brachinger, H. W. *Financial decision-making: are women really more risk-averse?* American Economic Review, *89*(2), 381-385. 1999.

Advice

- CIRANO, *Econometric Models on the Value of Advice of a Financial Advisor*, 2012
- Foerster, Linnainmaa, Melzer, Previtero, *Retail Financial Advice: Does One Size Fit All?* Journal of Finance August. 2017.
- Linnainmaa J., Melzer B., & Previtero A. *The Misguided Beliefs of Financial Advisors*. The Journal of Finance (*Volume 76, Issue 2*). 2020.
- Pagliaro Mehta, Shiao, Wang, Xiong, *Investor Behaviour Modeling by Analyzing Financial Advisor Notes: A Machine Learning Perspective*, Working Paper. 2021.
- *Putting a value on your value: Quantifying Vanguard Advisor's Alpha*, Vanguard. 2019.
- *Value: A sharper focus on the value of Advisors*, Russell Investments. 2021.
- Thompson, J. Feng, L. Grace, C. Metzler, A. Reesor, M. *Measuring Financial Advice: aligning client elicited and revealed risk, working paper.* 2021.
- Thompson, J. Feng, L. Grace, C. Reesor, M. *Know Your Clients' behaviours: a cluster analysis of financial transactions, Journal of Risk and Financial Management*. 2021.
- Von Gaudecker, H. M. *How does household portfolio diversification vary with financial literacy and financial advice?* The Journal of Finance, 489-507. 2015.

The Link to Physical and Mental Health

- Chen, J., Wei, H., *The Relationships Between Family Financial Stress, Mental Health Problems, Child Rearing Practice, and School Involvement Among Taiwanese Parents with School-Aged Children*, Journal of Child and Family Studies. 2013.

- EC Brüggen, J Hogreve, M Holmlund. *Financial well-being: a Conceptualization and research agenda*. - Journal of Business Management. 2017.
- Gutter, Copur. *Financial behaviors and financial well-being of college students: Evidence from a national survey*. Journal of Family and Economic Issues, 2011.
- Manulife, 2016 *Financial Wellness Index*
- Netemeyer, Warmath. *How am I doing? Perceived financial well-being, its potential antecedents, and its relation to overall well-being* - Journal of Consumer Research. 2018.
- Schmeiser, M, Seligman, J, Using the right yardstick: Assessing financial literacy measures by way of financial well-being. The Journal of Consumer Affairs, 2013.
- Strömbäck, Lind, Skagerlund, Västfjäll. - *Does self-control predict financial behavior and financial well-being?*. Journal of Behavioral and Experimental Finance. 2017.
- Taft, Hosein and Mehrizi. *The relation between financial literacy, financial wellbeing and financial concerns*. - International Journal of Business Management. 2013.
- Zurlo. *Personal attributes and the financial well-being of older adults: The effects of control beliefs*. PARC Working Papers. 2009.