Understanding Financial Capability in Canada

Analysis of the *Canadian Financial Capability Survey*

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Contents

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Summary

This report takes information on five areas or 'domains' of financial capability – making ends meet, keeping track, planning ahead, choosing products and staying informed – and generates five overall scores that capture Canadians' relative skills in these domains. This approach uses a standard statistical method known as factor analysis, which follows best practice in other research on financial capability (see sections 2.1 to 2.4). The outcome is a score from 0 to 100 for each respondent on each type of financial capability. The coherence of these domains was established by statistical means, but their underlying rationale is based on exploratory desk research and qualitative forms of inquiry.

The tables in Section 2 show how each factor was derived and the key variables that were used to develop each score. These are questions that were selected as appropriate for measuring different kinds of financial capability, and which relate to the latent dimensions of interest.

Further analysis of the factor scores looked at a number of characteristics together rather than separately (Section 2.5). There were some common themes. The sample of Aboriginal people scored worse on three of the five domains reported: making ends meet, choosing products and staying informed. These results applied even after controlling for any differences in incomes, qualifications and other data. Women tended to attain lower scores than men on planning ahead, but were better at keeping track of their financial affairs. Even so, these differences were small, and differences in age were more important in understanding levels of financial capability. Those with the highest qualifications tended to

have a higher level of financial capability, although the size of the effect varied by the different domains. In some instances there were differences between those living in different regions (for example, respondents in Quebec were better at keeping track of money and making ends meet), but generally these effects were relatively small.

In most cases there was a strong effect of age. For making ends meet, it was just better to be older. Levels of keeping track of finances did not vary much by age (the effect was "flatter"), and tended to be quite steady for those aged 30-60. Capability in planning ahead was rather higher for older working age groups, but particularly those older than 50. These factor scores may help to predict behaviour of other kinds, including saving for children's education.

The sample was classified as belonging to one of six groups. Just over one quarter showed no relative difficulty in any of the five domains. The other groups had different areas of strengths and weaknesses:

- One in 5 (20%) were doing well making ends meet and choosing products but showed difficulty with keeping track, planning ahead and staying informed.
- Just under 1 in 5 (18%) were doing well making ends meet, keeping track and choosing products but showed difficulty with planning ahead and staying informed.
- Just under 1 in 5 (17%) were doing well on most domains but showed some difficulty keeping track.
- The remaining 20% had more acute difficulties:
  - 12% showed difficulty in all domains except making ends meet.
  - 8% showed difficulty in all domains except keeping track.

1. Introduction

The *Canadian Financial Capability Survey* (CFCS) collected a wide range of data on Canadians' approaches to money management, their use of financial products, and their financial habits and circumstances. The survey questionnaire asked respondents about their behaviours and attitudes, and included a small set of questions about objective knowledge. The survey design was heavily informed by the concepts that underlie the UK's Baseline Survey on Financial Capability and generally tried to cover many of the same domains of financial capability – namely making ends meet and keeping track of money in day to day finances, planning ahead for expected and unexpected costs and events, choosing and using financial products and services, and staying informed on financial matters. This new source of information therefore provides a strong platform on which to build an analysis of financial capability in Canada.

The tables and graphs that examine the data typically look at one, two or three variables at the same time. These kinds of headline findings are important but are subject to two main limitations. First, where there are many questions on the same (or a closely related) concept, it would be preferable to look at the true underlying concepts of financial capability, rather than at lots of individual questions. Second, there are often links between different characteristics of people, each of which may affect financial capability. For instance, younger adults tend to have lower incomes, are less likely to have children, and have less experience of financial transactions, but may have higher levels of formal education than other adult Canadians. Each of these variables may be related to financial capability in different ways, and it would be helpful to try to disentangle which are the most important factors associated with financial capability.

The first key feature of this report is that it derives new measures of financial capability and for different domains of financial capability. These new measures are not directly observed, but instead are inferred from the set of questions that were asked. Existing questions are appropriately combined into new scores that best capture different domains

of financial capability.[1] Deriving these summary measures of financial capability is the first main aim of this section, and the analysis is shown in sections 2.1 to 2.4.

Once these measures of financial capability are derived, we use multivariate approaches to examine the groups with higher and lower levels. We use methods that try to unlock the particular contributions of different factors while controlling for a wide range of information[2] – for instance, whether any effect from gender or age on financial capability is altered when we include information on household income. This analysis is shown in Section 2.5.

A similar approach to analyzing financial capability was taken by researchers using the 2005 UK Baseline Survey of Financial Capability (Atkinson et al. 2006). The questions asked were quite different, and the modes of interviewing were distinct (face-to-face in the UK, telephone interviews in Canada). The different institutional contexts and ranges of products available also mean that direct replication would not have been possible even if it had been desirable. The set of questions used to measure financial capability are therefore somewhat different.

Another important aim of this research, developed in Section 3, is to see if Canadians may be classified into groups, based on levels of financial capability in different domains, and, if so, to identify the characteristics of each of those groups. This kind of segmentation (or "cluster analysis") of the population may be useful, alongside the factor analysis, for policy purposes where a target population in greater need can be identified. This type of statistical analysis was also part of the UK research.

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1   The standard statistical technique of factor analysis is used when there are believed to be underlying or latent concepts, with which a range of actual questions, or other observed data, are correlated (Bartholomew *et al*. 2008).

2   This uses another common statistical method, known as multiple linear regression.

2. Underlying Dimensions of Financial Capability

Exploratory research in the UK identified a set of four separate "domains" of capability (Kempson *et al.* 2005): *managing money* (living within one's means); *planning ahead* (dealing with risk and the longer term); *making choices* (choosing appropriate financial products), and *getting help*. This scoping research, based on reviews and small-scale qualitative approaches, was subsequently refined after the large-scale data collection. *Managing money* was divided into two contrasting sub-domains: *making ends meet* and *keeping track of money*. An alternative domain, *staying informed,* found greater support than *looking at means of getting help*. The design of the Canadian survey and its analysis has largely adopted this framework.

It is important to highlight that no single indicator or even domain can be used to measure financial capability holistically. The domains are conceptually distinct and draw from different data sources in the survey. Only by looking across all domains is it possible to arrive at a picture of what a more or less financially capable person looks like and how Canadians are faring in each of the aspects of capability.

For each of the domains of financial capability we followed a particular structure. First we identified those questions that appeared to be most representative of the each of the underlying concepts. Here we present the *factor loadings* from the factor analysis. This technique is described in a little more detail in Section 4.1. It is customary to interpret a level of 0.3 and above as indicating a potentially important link, although figures of 0.16 are statistically significant with a sample of only 1,000, compared with the more than 15,000 respondents interviewed for the CFCS. It would be possible to further simplify the factor scores by removing those questions with the lowest loadings, but even the lowest values reported here (around 0.14) provide support for retaining each question.

These factor loadings are essentially the "weights" that are used to construct the overall factor scores. The overall factor score is based on the response to each question, multiplied

by the weight of each question. The weight is a measure of how closely the question seems to be capturing the underlying concept. For ease of interpretation, each factor score is re-scaled to vary between 0 and 100,[3] – that is, the highest and lowest scores observed within each domain. This range of 0-100 is then plotted for each domain of financial capability to show the overall distribution.

It is crucial to appreciate that this is a *relative* scale, and shows results relative to other Canadians. It does not include any kind of "pass/fail" mark. Nor is there any particular level that would justify concern or policy intervention. The factor scores derived are not absolute measures – though they are capable of showing differences between people, and they change over time.

Table 8 in the annex (Section 4.2) shows the average levels for each domain of financial capability, for groups defined by a broad range of social and economic characteristics. These should be read in conjunction with the multivariate analysis, and they provide an important reference source for looking at those groups with higher and lower levels of financial capability in Canada. It is also possible to use similar approaches to investigate the structure of people's subjective assessments of their finances, and their objective knowledge.[4]

2.1 Money Management

A core aspect of financial management is how people handle their money. Are they able to keep expenditure within their incomes, or are they running up debt? A core component of money management is therefore considered to be the ability to make ends meet. A second component, that we consider later, is the strategy that people adopt for keeping track of their finances. In particular, are they setting and keeping to household budgets and how often are they checking their financial position? The task of making ends meet is likely to be

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3   This is calculated as the value itself, minus the minimum value, and divided by the range. This is then multiplied by 100.

4   We show such analysis in Section 4.4.

made easier, of course, by having a higher level of income – and this is something that we examine later. There is no such presumption for keeping track of income, which might in fact be a skill more honed among Canadians on lower incomes.

The CFCS included a number of questions devoted to money management. These were included in a factor analysis model, with some of the key results displayed as Table 1. As expected, there was a fairly strong separation into questions that relate to making ends meet, and a second set that reflect keeping track of money.[5] There were a number of questions in the first category, in particular related to whether people were able to keep up with their bills and financial commitments. Less prominent, but still connected with making ends meet, was a subjective assessment of both keeping track of money and enjoying dealing with financial affairs.

Two key elements related to keeping track of money, also shown in Table 1, are setting budgets and staying within them. These are the most important constituents of the overall factor score for the second factor. However, these are affected by how often people check their balances and whether they have more than one bank account. In other words, Canadians with more bank accounts are less likely to keep track of their money as well as those with fewer accounts.

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5   Section 4.1.1 demonstrates how some variables are slightly amended before being included within the factor analyses.

Table 1   Factor Analysis of Managing Money – Two Key Dimensions

Question in CFCS	1 (making ends meet)	2 (keeping track)
OE_Q17 Again, thinking of the last 12 months, which one of the following statements best describes how well you and your family have been keeping up with your bills and other financial commitments?	.706	
OE_Q14 Thinking about the last 12 months, were you ever behind two or more consecutive months in paying a bill?	-.691	
SA_Q03 How would you rate yourself on each of the following areas of financial management...? ... making ends meet	.602	.286
OE_Q16 In that same time period [last 12 months], were you ever behind two or more consecutive months making a loan payment?	-.535	
SA_Q02 How would you rate yourself on each of the following areas of financial management...? ... keeping track of money	.494	.393
OE_Q15 Still thinking about the last 12 months, were you ever behind two or more consecutive months in paying your rent or mortgage?	-.481	
SA_Q07 Please tell me if you agree or disagree with the following statements. I enjoy dealing with financial matters.	.279	.276
OE_Q11 Do you have a household budget?		.841
Staybgt (dv)[6] How often person stays in budget		.839
OE_Q05 How often do you usually check your account balance(s)?		.445
OE_D02 Total number of bank accounts	-.108	-.315
OE_Q04H How do you typically check the balance for your account or accounts? I never check		-.257

Model summary: KMO = 0.60. Variance explained by first factor: 20%. Variance explained by second factor: 16%

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[6]   A derived variable for whether people stay in budget: Always, Usually, Rarely, Never + DK + no budget.

Box 1 Factor Analysis Concepts – KMO

The KMO (Kaiser-Meyer-Olkin statistic) is a diagnostic statistic varying between 0 and 1 for how appropriate it is to conduct factor analysis. It is based on the amount of common variance among the variables. Factor analysis should not proceed if the value is less than 0.5; a value of 0.6 or higher is often regarded as a required starting point.

From this set of questions we derive an overall score for financial capability in the domain of managing money – both in terms of making ends meet and of keeping track of money. For ease of presentation we present this score as ranging from 0 to 100 (representing the highest and lowest scores obtained on this domain). This re-scaling is carried out for each factor, for ease of interpretation. This overall score may be plotted to indicate levels of financial capability in the Canadian population. The shape of distribution will reflect the ability of the questions to discriminate groups with higher and lower levels within each domain.

In Figure 1, the distribution of scores on making ends meet is shown (the average, or mean, score was 81.9). Most Canadians score relatively high on making ends meet, as adjudged by the set of questions from Table 1. Then there is a long tail of those who find it more difficult to live within their means. Most people are managing to live within their means, and relatively few are experiencing problems relative to others. However, those few whose experience is very different from the mainstream would likely be having multiple difficulties living on their available incomes.
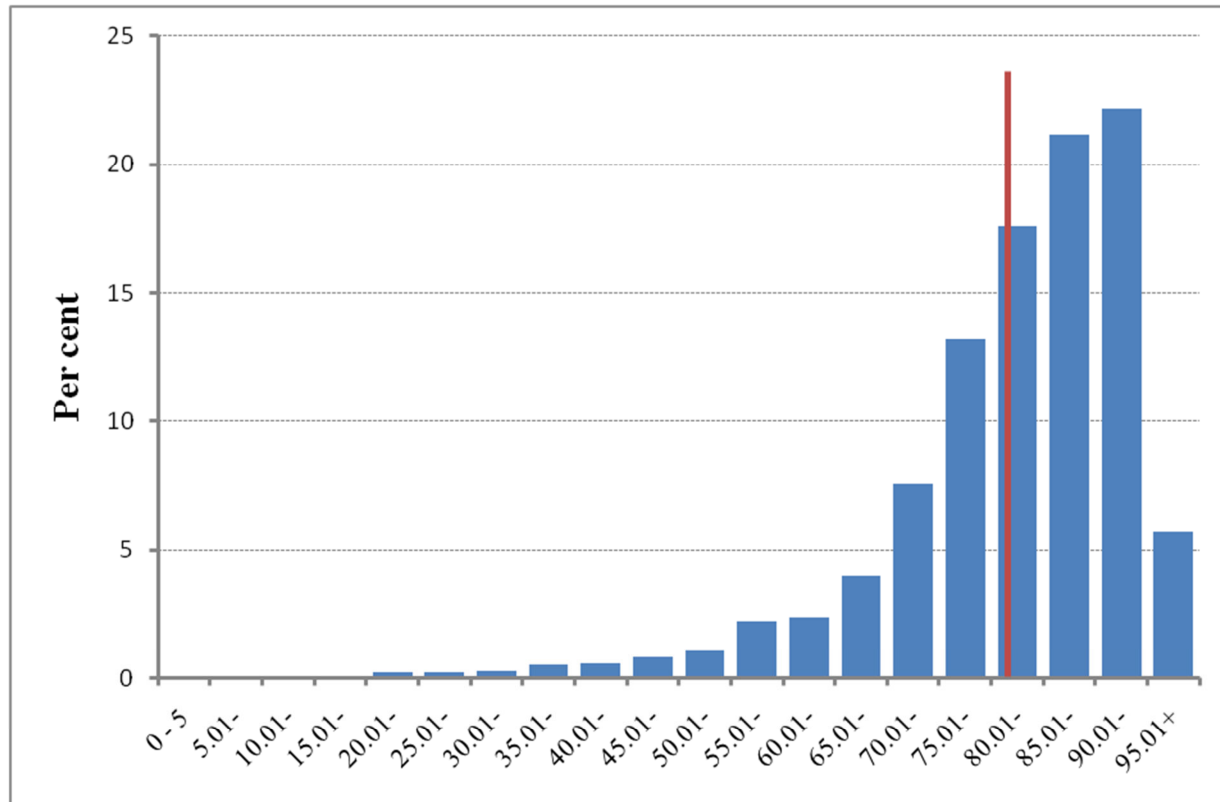
In terms of keeping track of money, there is a clear bimodal distribution, with two groups of people adopting different approaches (Figure 2). These two groups in the distribution reflect those who do and do not set budgets, with the variation around those peaks reflecting their other information. The overall average score was 65.6, but this doesn't really capture the diversity in people's behaviours. There was also a sizeable minority who score relatively low in keeping track of their money.

Figure 2   Distribution of Scores for Keeping Track [average in red][7]
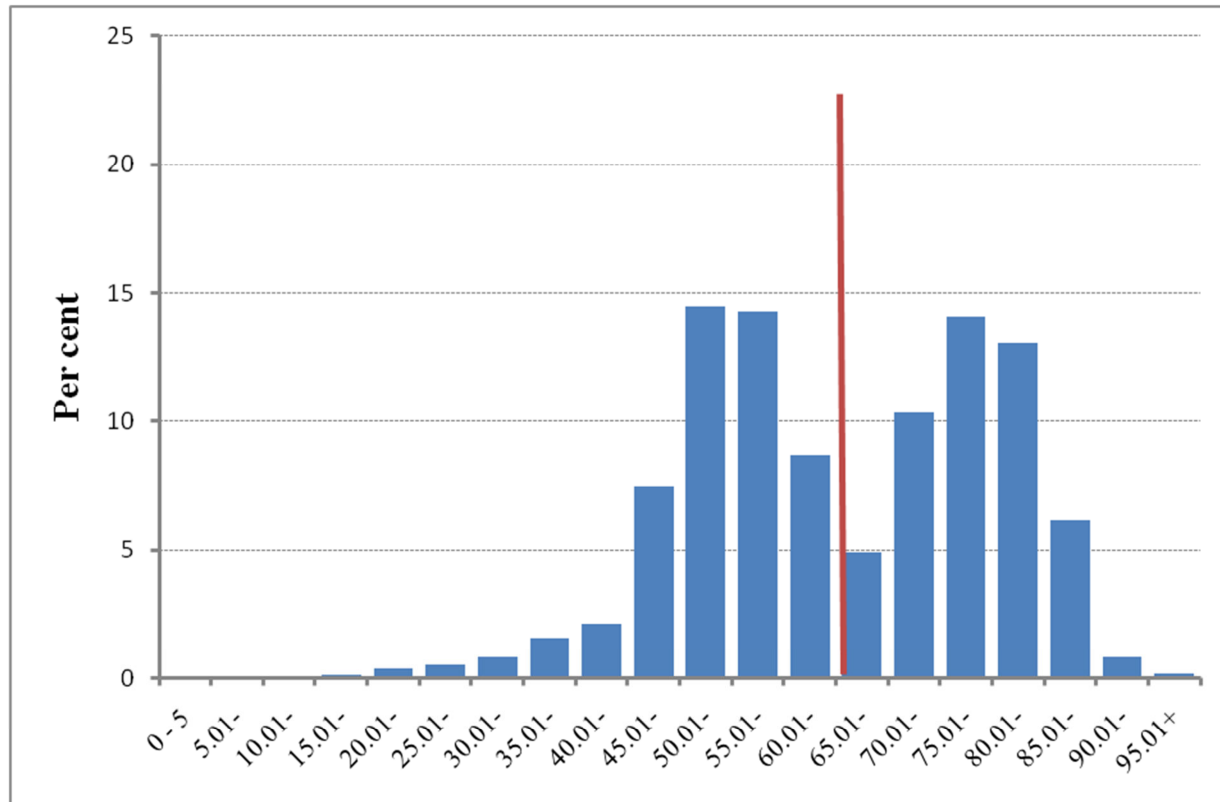
2.2 Planning Ahead

The ability to plan ahead provides another core component of financial capability. The key variables associated with planning ahead are shown in the summary of the factor analysis in Table 2. These include a number of pieces of information that relate to retirement planning, taking out insurance, dealing with large unexpected expenses, and making wills. This set of questions and their associated loadings accounted for 26 per cent in the variation across these questions.

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7   To increase comparability, Figures 1 to 5 are all drawn to the same scale.

Table 2 Factor Analysis of Planning Ahead – One-factor Solution

	Planning ahead
RP_Q01 Are you financially preparing for your retirement either on your own or through an employer pension plan?	.831
RP_QN (dv) Expected N sources for retirement income[8]	-.778
INS_N (dv) N insurance areas[9]	-.556
RP_Q09 Do you have a good idea of how much money you will need to save to maintain your desired standard of living when you retire?	.460
RP_Q08 Taking all of the various sources of retirement income into account for your household (including government sources as well as personal and occupational pensions and provisions), how confident are you that your household income at the time of your retirement will give you the standard of living you hope for?	.409
FC_Q09 Do you currently have a will?	.396
ME_Q01 Excluding home purchases as a principal residence and the possible cost of your children's higher education, do you plan to make any purchases or expenditures of $10,000 or more in the next three years?	.348
FM_Q02J If you had to make an unexpected expenditure today of $500, how would you pay for this expense? Would not be able to pay this expenditure	-.332
FC_Q10 Do you currently have powers of attorney drawn up for your household?	.325
FM_Q03J And if the expenditure were $5,000, how would you pay for this expense? Would not be able to pay this expenditure	-.296

Model summary: KMO = 0.60. Variance explained by first factor: 26%.

There was considerable diversity in people's capacities and capabilities to plan ahead. The distribution of scores, shown in Figure 3, has a relatively flat structure, with some large peaks towards the centre and a mean of 60.8. A significant group was doing rather less

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8   Derived variable for number of different sources of retirement income, based on RP_Q02A to RP_Q02K.

9   Derived variable for number of different sources of retirement income, based on FC_Q07A to FC_Q07H.

planning, with scores around the 20-40 mark. This representation shows a great deal of diversity in the population, with sizeable groups doing much less planning than the average.

Figure 3   Distribution of Scores for Planning Ahead [average in red]
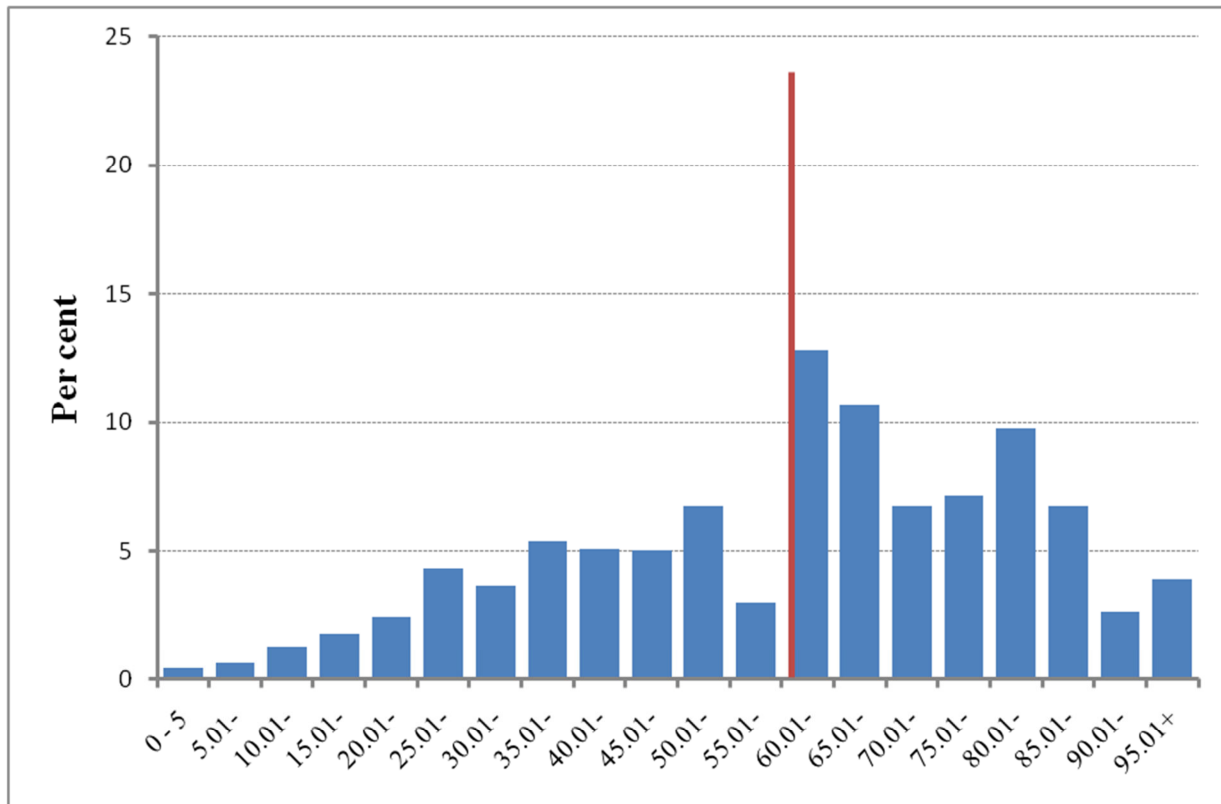
2.3 Choosing Products

Next we consider the behaviour displayed towards selecting appropriate financial products. A factor analysis of the most relevant questions and their loadings is shown in Table 3. There were important influences from both objective and subjective knowledge questions. Scores for financial capability in choosing products were higher where people were knowledgeable about looking at the pricing of different goods and where they expressed a high degree of confidence in their subjective abilities.

Table 3   Factor Analysis of Choosing Products – One-factor Solution

|	Choosing products
INS_N (dv) N insurance areas[10]	.628
OA_Q06 If you had a savings account at a bank, which of the following statements would be correct concerning the interest that you would earn on this account?	.559
OA_Q05 If each of the following persons had the same amount of take home pay, who would need the greatest life insurance?	.534
SA_Q10 Please tell me if you agree or disagree with the following statements. I've got a clear idea of the sorts of financial products that I need.	-.531
OA_Q04 True or false. By using unit pricing at the grocery store, you can easily compare the cost of any brand and any package size.	.481
SA_Q12 Please tell me if you agree or disagree with the following statements. I know enough about investments to choose ones that are suitable for my circumstances	-.455
SA_Q13 Please tell me if you agree or disagree with the following statements. I always research my choices thoroughly before making any financial decisions	-.425
OE_G03 With how many different institutions do you have these accounts? – grouped	.317
SA_Q04 How would you rate yourself on each of the following areas of financial management...?... shop around to get the best financial product such as loans or insurance rates	-.314
FC_Q08 Do you have all your insurance policies with 1 company?	.231
OE_D02 Total number of bank accounts	.210
FM_G04C In the past 12 months, how many times have you used a cheque cashing service other than a bank?	-.184
FM_G04A In the past 12 months, how many times have you used a pawnbroker to sell a possession?	-.146
FM_G04B In the past 12 months, how many times have you used a payday loan service?	-.136

Model summary: KMO = 0.71. Variance explained by first factor: 16%.

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10   Derived variable for number of different sources of retirement income, based on FC_Q07A to FC_Q07H.

As before, we converted this information into an overall score. The average was 69.9. Most respondents seemed to have a facility in selecting financial products. Many scored quite low, but very few scored at the very lowest end (Figure 4). This is a relatively positive result, with a more closely grouped population indicating less diversity in behaviour than for other scores.

Figure 4   Distribution of Scores for Choosing Products [average in red]
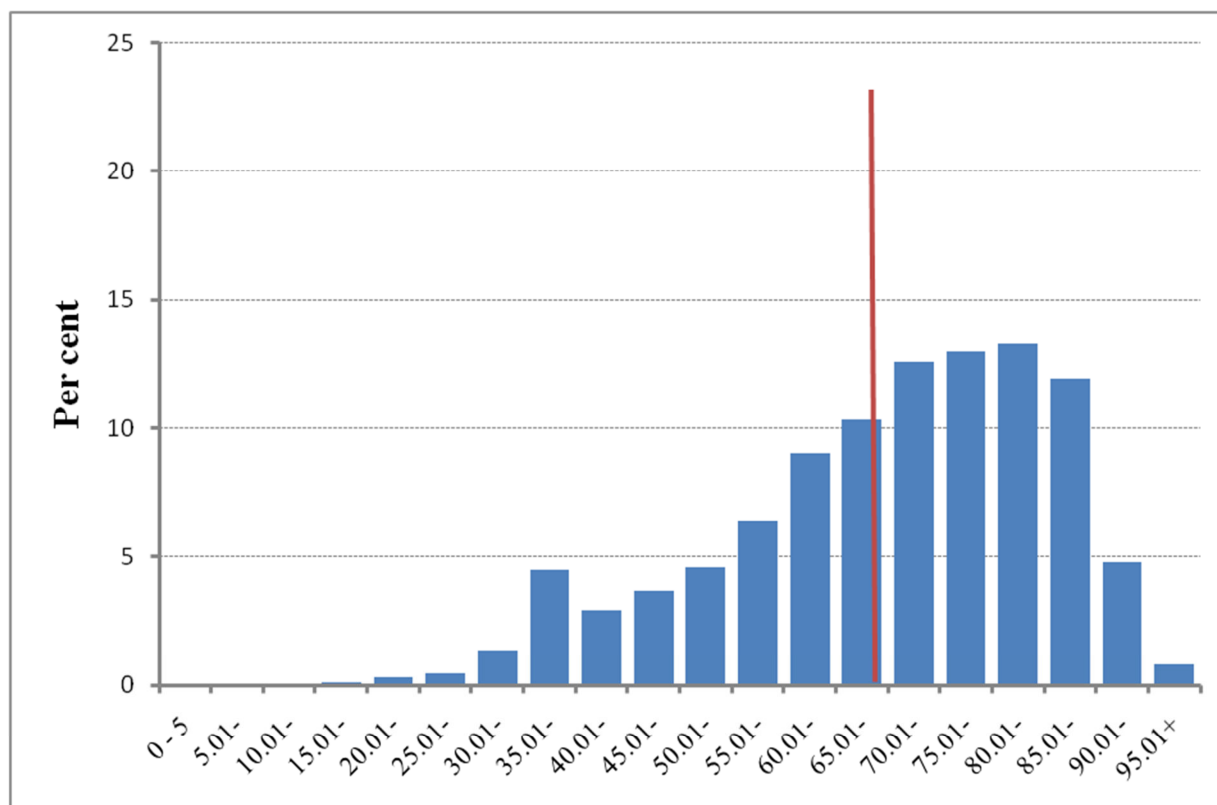
2.4 Staying Informed

Last in this section of the report we consider how far people were staying informed with financial news of different kinds. The factor analysis is shown in Table 4. Those scoring highest tended to be those who were looking at a number of different sources of information and receiving advice on several products. They also tended to score more highly on the separate test of objective financial knowledge.

Table 4 Factor Analysis of Staying Informed – One-factor Solution

	Staying informed
NEye (dv) N things keeping an eye on[11]	.748
NHow (dv) N sources used for monitoring	.747
NProd (dv) N products on which received advice	.653
NAdvice (dv) N sources consulted for advice	.639
SA_Q05 How would you rate yourself on each of the following areas of financial management...? ... staying informed on financial issues	-.520
NInfo (dv) N sources consulted for information	.518
QUIZ (dv) Score on objective assessment questions	.510
SA_Q01 How would you rate your level of financial knowledge?	-.439
SA_Q11 Please tell me if you agree or disagree with the following statements. I keep a close personal watch on my financial affairs	-.264

Model summary: KMO = 0.71. Variance explained by first factor: 33%.

There was great uniformity in the extent to which people were staying informed (see Figure 5). Relatively few scored at the very highest levels or the very lowest. A great number of people were near the average in keeping abreast of financial developments, with only a small percentage taking advantage of most opportunities to stay informed.

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11 NEye, NHow, NProd, NAdvice and NInfo are based on the sum of different parts of the questionnaire relating to financial capability. The specific sections are FC_Q01A to FC_Q01I (NProf); FC_Q02A to FC_Q02P (NAdvice); FC_Q04A to FC_Q04H (NInfo); FC_Q05A to FC_Q05J (NEye); FC_Q06A to FC_Q06H (NHow). QUIZ is the number of correct answers to the objective assessment test (OA_Q01 to OA_Q14).

Figure 5   Distribution of Scores for Staying Informed [average in red]
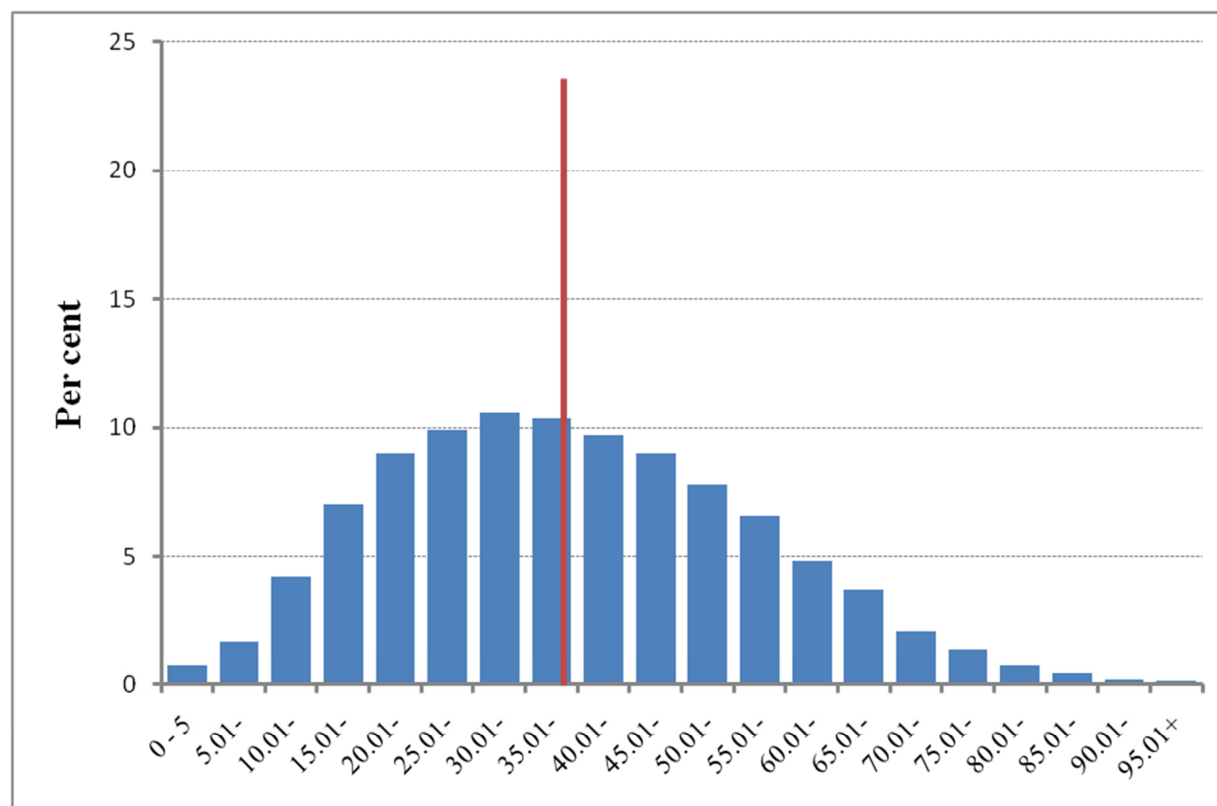
2.5 Groups with Higher and Lower Financial Capability – Multivariate Analysis

In this section we make use of regression analysis to analyze the differences between levels of financial capability. Detailed regression results are shown in the Annex, Section 4.2.2 (Table 9 and Table 10). The tables show the effect of each characteristic on levels of capability indicating a range for each domain from 0 to 100. Hence, an effect of 1.0 may be statistically significant, but of rather less policy or practical importance than an effect size reported as 5.0.

It is important to remember that these results are expressed holding all the other variables constant. So, when we look at younger people, we are looking at the effect of age after controlling for other differences (such as a higher proportion who are single, and more on lower incomes). Conversely, the effect of income is looked at independently to those of

education and age. The aim is to get closer to the true effect of each variable, considered independently of other variables, which are held constant.

In looking at any variable that is a category – such as education, or region – the standard approach is to include one variable for each category, except for one which acts as a basis of comparison. For the statistical routine it does not matter which category is chosen for comparison, but it is customary to have the largest category as the baseline group against which the smaller groups are then compared. Selecting different baseline groups does not change the substantive conclusions of the results, or the overall value of any of the models.

Age Differences

For all domains of financial capability there were some differences by age. In all cases there was generally an effect of age that was quite strong, though the peak ages differed by domain. For making ends meet, it was just better to be older. Levels of keeping track of finances did not vary much by age (the effect was flatter), and tended to be quite steady for those aged 30-60. Perhaps unsurprisingly, capability in planning ahead was higher for older groups, particularly among Canadians older than 50. The strong effect of age made this one of the more predictable domains of financial capability. Age had important, though weaker effects, on differences in levels for choosing products and staying informed.

Inequality and Financial Capability

Whilst we look at each domain in some detail, in fact there are some common themes. Overall, Aboriginal respondents to the survey tended to score worse on three of the five domains reported: making ends meet, choosing products and staying informed. These results apply after controlling for any differences in incomes, age, education and the range of variables shown in the Annex.

Women tended to attain lower scores than men on planning ahead, choosing products and staying informed, but were better at keeping track of their financial affairs than men. However, the differences by gender were usually quite small and therefore of limited practical significance. For making ends meet and keeping track there were no significant

gender differences. Average scores did rise in each domain of financial capability with increasing levels of formal education. However, the size of the effect varied and was not uniformly significant.

We now look at each factor in turn.

Making Ends Meet

On making ends meet only, levels were higher in Quebec than in the other regions. They were somewhat lower among renters than homeowners, and unsurprisingly higher among those with higher incomes. Each of these effects stands as independent of the other effects shown in the tables. Being unemployed had a sharp negative effect on people's ability to make ends meet, even after controlling for differences in income. Canadians with more formal education also did better on making ends meet – again, in addition to any effect of having a generally higher income. Overall, this set of variables was able to explain about 24 per cent of the differences between people in their levels of financial capability.[12]

Keeping Track

It was harder to explain differences between people in their ability to keep track of financial matters (the model explaining about eight per cent of variation). These were not related, at least not in any reliable manner, to differences in family income. It is possible that these kinds of behaviour are quite deeply ingrained, and less affected by differences in personal circumstances. Again, residents of Quebec scored highest in their ability to keep track of finances. Those without a high school diploma tended to score among the lowest in keeping track of money.

Planning Ahead

The scores for planning ahead were more systematically related to the observed information about people – the model could account for some 52 per cent of the differences

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12 Whilst this might sound like a low figure, in fact explaining 24 per cent of the variance is quite a good result when analysing cross-sectional data on individuals. However, it provides a reminder that there is a lot of unexplained variation in levels of financial capability. This figure is provided by the R-squared statistics shown in the model tables.

in planning ahead scores between people. Again some of the key factors associated with higher levels of financial capability, regarding planning ahead, were qualifications and economic status. Being in work, especially as an employee, had a larger effect than any differences in income. Levels of planning ahead tended to be lower among single people than couples (again, after controlling for differences in age and income).

Choosing Products

The ability to choose among financial products was lower in Ontario than in the other regions. The self-employed seemed better equipped to choose products than employees. However, the separate effect of having a higher income seemed to be quite small – much smaller than the effect of labour market status, for instance. The model was able to explain around 23 per cent of the variation in scores for choosing products.

Staying Informed

The model for staying informed showed a somewhat greater association with higher incomes. Education also played a powerful independent role. However there was less variation by region. As with choosing products, the self-employed tended to be doing more activities to remain well-informed than were employees. Women tended to score somewhat lower than men. The model accounted for 27 per cent of variation in scores.

Box 2 An Application: Financial Capability and Planning for Children's Education

How far can the derived factor scores be used for analyzing other topics? We look at whether people said that they were either currently saving, or had already saved, to support the cost of children's postsecondary education (which was question EF_Q02). Since this outcome only has two main responses, a different kind of regression is needed – and logistic regression results are shown in section 4.3. We also list a number of variables that did not prove to be statistically significant – including level of income, which has a strong link to this kind of saving in simple tables. Saving for children's education was associated with planning ahead and being able to make ends meet. It was also more common for existing graduates and less likely for Aboriginal people.

2.6 Links between the Different Domains of Financial Capability

In Table 5 we show the inter-links between the domains of financial capability. While keeping track of money and making ends meet are not associated, as in the UK, there are statistically significant associations between each of the different domains of financial capability. The strongest associations were found between staying informed, planning ahead and choosing products. These were correlated, if a little less strongly, with making ends meet and keeping track of money.

Correlations vary from -1 to +1, with 0 indicating no correlation of any kind. The higher the value, the more closely correlated the two concepts. Where a correlation is high, such as between planning ahead and choosing products, it is likely that some similar skills are being measured. Those scoring highly on planning ahead, other things being equal, are more likely to score highly on choosing products. This is an association, not a cause – causation could run in either direction, or there might be a further characteristic causing this close association. There were relatively weak links between staying informed and making ends meet, and between planning ahead and keeping track of money. Knowing the score on either of these pairs of concepts gives very little indication about how a given individual will score on the other concepts.

Table 5   Correlations between Factor Scores in Different Domains

					Pearson correlations
	MEM	KT	PA	CP	SI
MEM	-	[n.s.]	0.33	0.32	0.21
KT		-	0.24	0.35	0.35
PA			-	0.49	0.47
CP				-	0.53
SI					-

All correlations shown are significant at the 0.1% level, unless otherwise stated

3. Patterns of Financial Capability among Canadians

The aim of this section is to classify respondents to the CFCS into groups that have similar scores for financial capability. Those within each group (or cluster) should be relatively alike, and distinct from those in the other groups. In this analysis the starting point is to use all of the five factor scores for the various domains of financial capability. A short introduction to cluster analysis is provided in Section 4.5.

On the basis of statistical criteria[13] and overall interpretability, it was determined that six clusters provided a plausible categorization of respondents. Some possible shorthand descriptions of each group are shown in Table 6. Two groups ([1] and [2]), comprising 43 per cent of Canadians, achieved relatively high levels of financial capability, although the latter group were below average on keeping track. Two groups ([5] and [6]) generally scored low values for financial capability, with the latter group having the lowest scores on making ends meet. Members of group 5 were still living within their means, however.

Table 6   Cluster Analysis of Factor Scores

Cluster	Per cent	Description of relative financial capabilities
[1]	26.6	High scores in all aspects.
[2]	16.5	High scores in all aspects, except keeping track.
[3]	17.5	Weaker in planning and staying informed.
[4]	20.1	Weaker in planning and staying informed, and keeping track.
[5]	11.6	Just below average at making ends meet, and low scores in most domains.
[6]	7.7	Very low on making ends meet, average for keeping track, other scores low

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13   In particular, the Bayesian Information Criteria measures for different numbers of possible clusters.

The set of scores attained by each of these groups, and the basis of their descriptions, are shown in Table 7. Scores that are clearly below the average are highlighted.

Table 7   Average Capability Score for the Cluster Groups

Note: highlighted scores are at least 10 per cent lower than the average

Cluster	Short description	Making ends meet	Keeping track	Planning ahead	Choosing products	Staying informed
[1]	High scoring	85	80	78	82	54
[2]	High scoring, not KT	90	58	77	82	52
[3]	Weaker planning and SI	82	77	52	69	32
[4]	Weaker in PA, SI and KT	86	53	61	70	20
[5]	Weaker in PA, SI, KT and CP	79	60	33	50	34
[6]	Weak in PA, CP and SI, v weak in MEM	51	68	45	65	39
All		82	66	62	72	39

The association between age group and cluster identity is shown in Figure 6. Respondents of working age tended to fall into the groups with higher levels of financial capability. Those aged 65 and older were least likely to be in the group that was weakest at making ends meet. Even so, 12.2 per cent in this age group were weaker in four of the five domains but scored near average at making ends meet.

Figure 6   Cluster Groups by Age Band
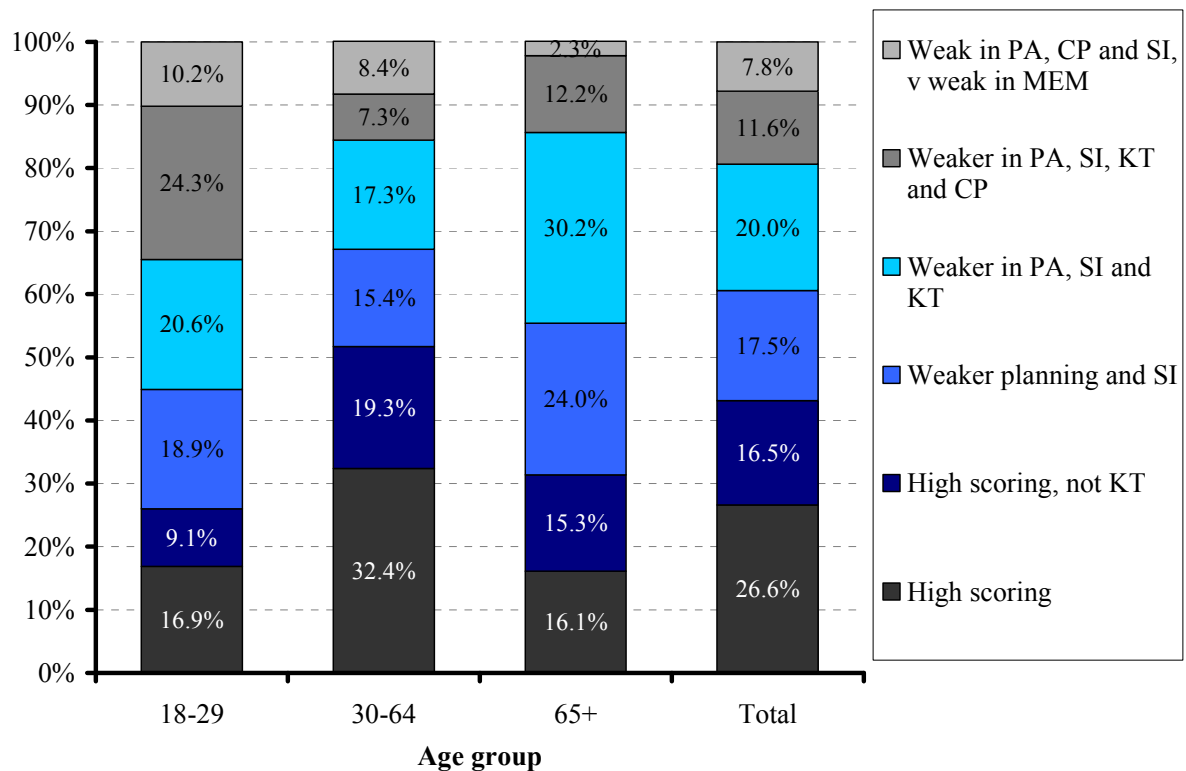
A breakdown of the different groups by region is shown in Figure 7. The differences are relatively small, however. Quebec and Alberta had the fewest who scored low on making ends meet. Quebec and Ontario were the most likely to be classified as scoring highly on all areas of financial capability.

Figure 7   Cluster Groups by Region
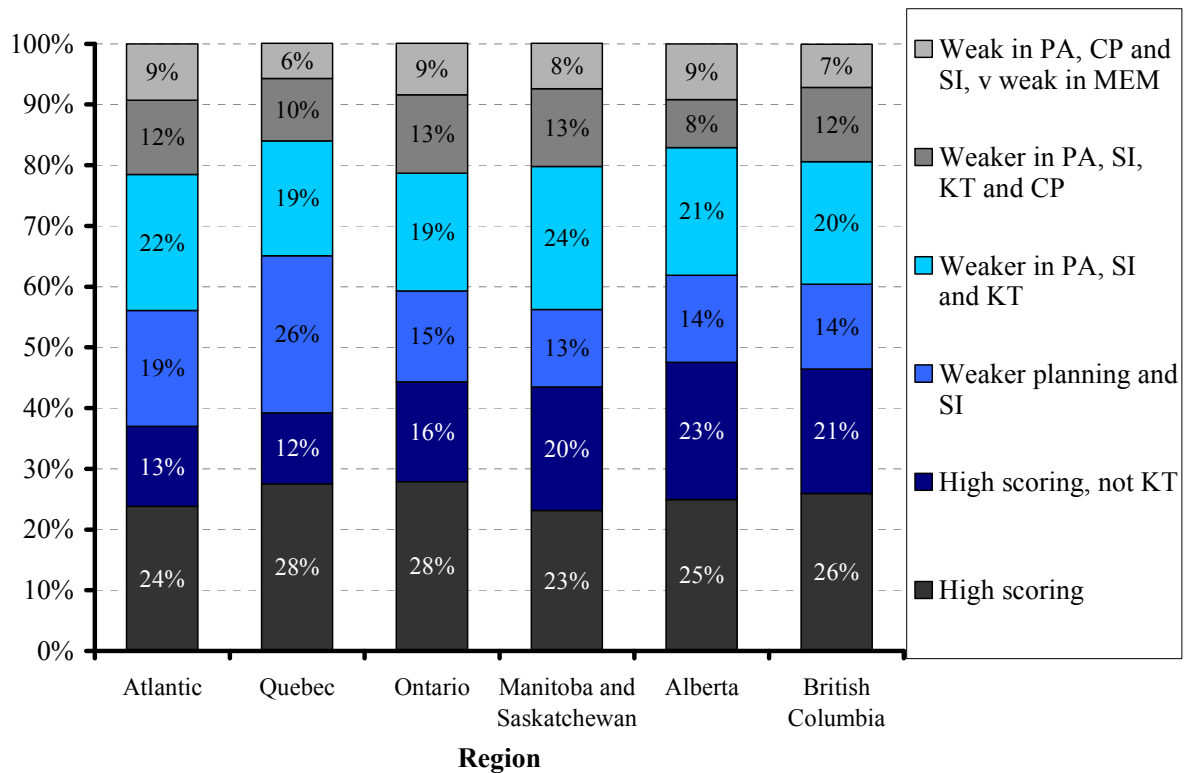
The differences in the frequency of each type of cluster, by family type, were quite stark (Figure 8). Among single families with younger children, one in four was in the sixth category, with the weakest scores on making ends meet. Single families with older children were rather more diverse across these cluster groups. More complex types of families ("Other Families") were also among the most likely to have difficulties, and least likely to be classified as having an above-average score in all domains of financial capability. Couple families were the most likely to be doing well in each aspect of financial capability.

Figure 8   Cluster Groups by Family Type[14]
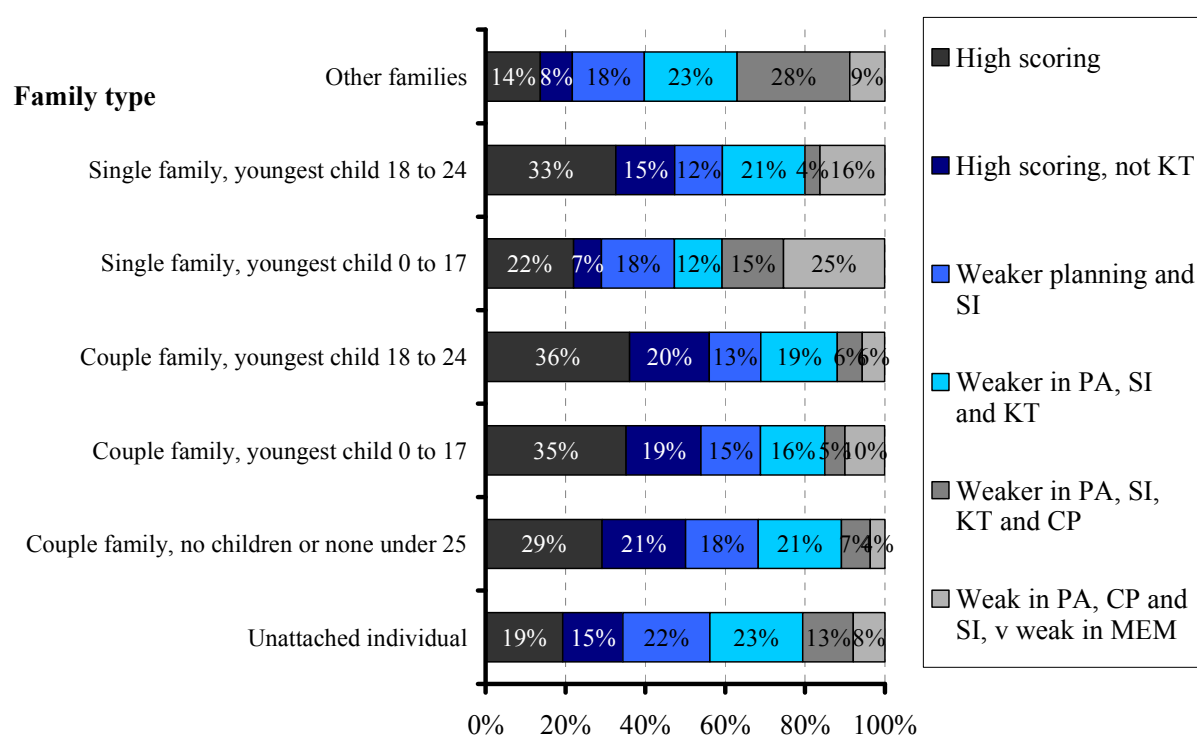
14 For the purpose of the Survey, "family type" is defined using the Statistics Canada definition of "economic family" which is "a group of two or more persons who live in the same dwelling and are related to each other by blood, marriage, common-law or adoption. A couple may be of opposite or same sex. Foster children are included." Unattached individuals may live alone or with other persons who are not part of their economic family. Other families may include all other forms of relationships of blood, marriage, adoption or common-law outside of parent-child and couple relationships accounted for in the other categories of this variable.

There was a strong association between educational attainment and being in certain of the cluster groups (Figure 9). Those with degrees, particularly at the graduate level, were the most likely to obtain high financial capability scores across the board and the least likely to be weak in making ends meet and several other domains. Even so, around 9 to 10 per cent of people were in the sixth group, with the lowest scores for making ends meet, among those without university degrees.

Figure 9   Cluster Groups by Educational Attainment
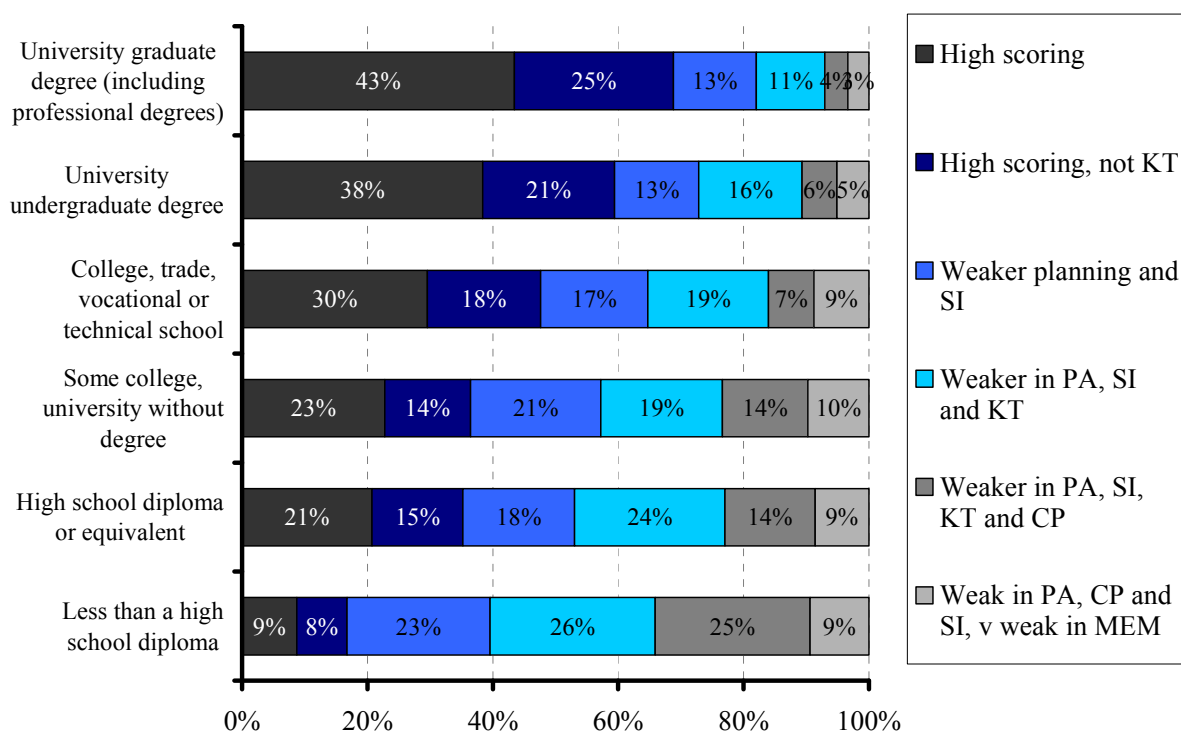
In the last two graphics, Figure 10 and Figure 11, we show the distribution of cluster group by quintiles[15] of income and of net worth. As expected, managing money is less problematic for those with access to greater resources. Those with higher incomes, or with higher levels of wealth, were least likely to be in the sixth cluster group, which was very weak in terms of making ends meet. Those with low wealth, even more than those with low incomes, were

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15   Quintiles divide the population into five groups of equal size, ranging from those with the most to those with the least incomes (or wealth).

the most likely to be part of this group. Those with high incomes or high wealth were also the most likely to be strong in all domains *except* keeping track of their money.

Even so, it is also clear that the associations between resources and financial capability are far from perfect. Many of those on middle and higher levels of income/wealth are below average in one or more domains of financial capability – and some of those with access to the least resources are part of high-scoring clusters.

Figure 10   Cluster Groups by Income Quintile
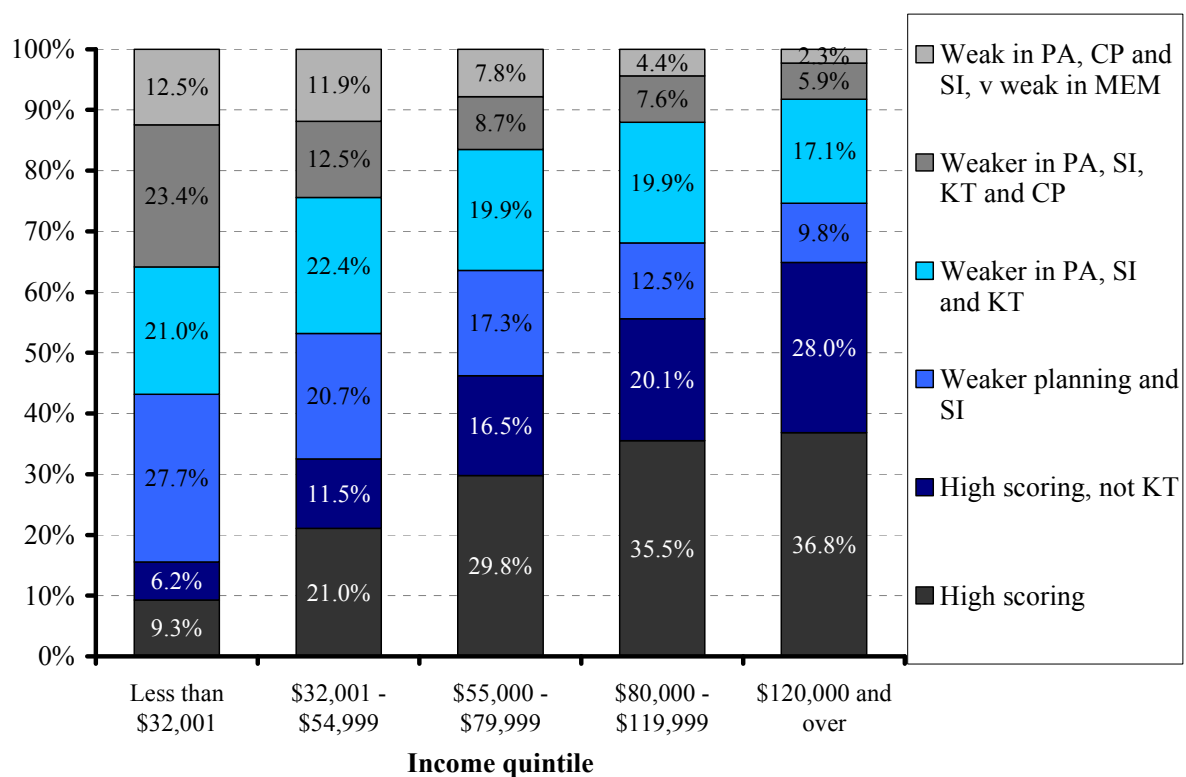
Figure 11 Cluster Groups by Quintile of Net Worth
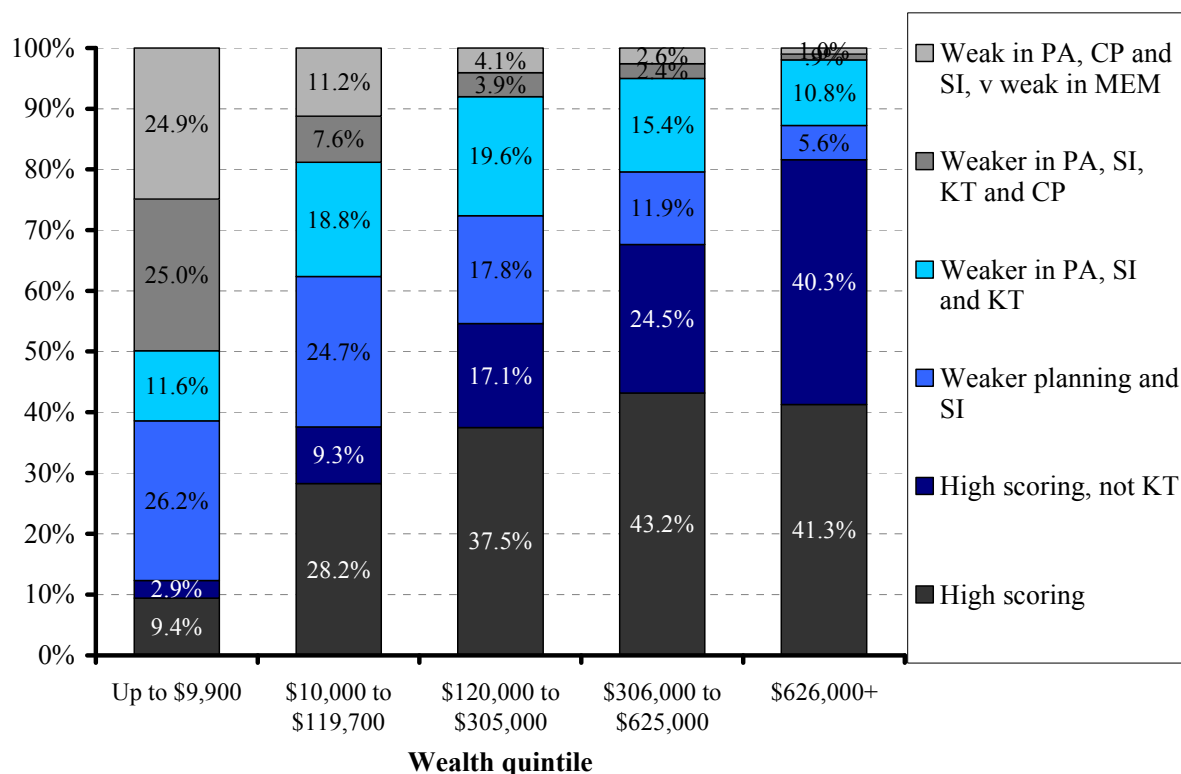
3.1 Looking for the Future – Updating the Analysis Over Time

The analyses above concern the existing CFCS. In some years' time, to check progress towards improving financial capability, it might be useful to compare these results with those from with new survey information. If so, then the estimates of the different factor scores (the factor loadings for each question) may be used to construct updated measures of levels of financial capability with any new data.

Another approach would be to use *confirmatory* factor analysis[16] if subsequent data was collected. This would aim to ascertain whether similar patterns are found.

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16 Confirmatory factor analysis is a statistical technique used to verify the factor structure of a set of observed variables. It allows the researcher to test the hypothesis that a relationship between observed variables and their underlying latent constructs exists.

4. Annex: Further Technical Details

4.1 Factor Analysis

It is the aim of factor analysis to reduce data from a large number of related variables into a smaller number of variables, which are the unobserved or latent factors that generate the set of observed variables. The method was developed by Charles Spearman around 1904, in his quest for a general characteristic – 'g' – of intelligence that could account for children's test performances (Cudeck and MacCallum 2007). Whilst that theory remains controversial, factor analysis has become a standard part of statistics.

It is possible to use factor analysis to derive new scales, or scores, for each respondent. Rather than simply adding up the questions that seem to be correlated, a standard approach to creating *scales*, factor analysis gives a different weight to each question depending on how well it correlates with the factor. Factor analysis looks at the consistency of questions, or how much different questions seem to be measuring the same thing. This is sometimes known as *reliability*.

The factor score is a linear combination (a weighted sum) of the observed variables, e.g., for two factors:

$$F1 = L1.X1 + L2.X2 + L3.X3 + ... LN.XN$$
$$F2 = M1.X1 + M2.X2 + M3.X3 + ... MN.XN$$

F_i – factor, L_i, M_i – loadings, X_i – the N variables, normalized.

The "weights" (L_i, M_i) for the variables (X_i) are based on how much they "load" on the factor (their correlation with the latent factor).

4.1.1 Recoding of Variables for the Factor Analysis

To include as many respondents as practicable in the analysis, those providing missing responses were often recoded to other numeric values. This involves an element of

selecting the appropriate response for these people. These recodes were implemented prior to running the factor analysis models, and are summarized in the table below.

Question #	Summary of question text	Summary of recoding done
Managing money (Making ends meet and Planning ahead)		
OE_Q12	How often do you stay within your budget?	Participants who validly skipped this question because they had no budget or answered "don't know" were recoded as answering "never."
OE_D02	Derived total number of bank accounts	Participants who did not provide answers to the source questions were recoded as having 0 accounts. Participants with 5-10 accounts were collapsed into a single category.
OE_Q04H	I never check my account balance(s)	Participants were recoded as confirming this response (Yes) or not (including negative and non-responses).
OE_Q05	How often do you check your account balance(s)?	Participants without an account and non-respondents were recoded as "Never."
OE_Q11	Do you have a household budget?	Participants responding "Don't know" or "refused" were recoded as "No."
OE_Q17	Self-assessed financial strain in last 12 months	Participants without financial obligations were recoded as "Keeping up without problems," participants responding "don't know" were recoded as "Having real problems."
SA_Q02 and SA_Q03	Self-rated ability on keeping track Self-rated ability on making ends meet	Participants responding "don't know" were recoded as "not very good", non-respondents were recoded as "fairly good."
SA_Q007	Enjoys dealing with financial matters	Participants responding "don't know" or not responding were recoded to be neutral between "Agree" and "Disagree."
Planning ahead		
FM_Q02A to FM_Q02J	Method to pay for $500 unexpected expense	Participants responding "don't know" and non-respondents were recoded as "No."
FM_Q03A to FM_Q03J	Method to pay for $5,000 unexpected expense	Participants responding "don't know" and non-respondents were recoded as "No."
FM_Q05, FM_Q06A and FM_Q06B	Withdrawal from RRSP, under tax shelters for housing or education	Participants responding "don't know" and non-respondents were recoded as "No."
ME_Q01	Planning a major expense of $10,000 or more, outside of exclusions?	Participants responding "don't know" and non-respondents were recoded as "No."
ME_Q03A to ME_Q03O	Method to pay for planned expense	Participants responding "don't know" and non-respondents were recoded as "No."
RP_Q08	Confidence about retirement	Participants responding "don't know" were recoded slightly negatively between "Not very confident" and "Not at all confident"; non-respondents and participants who were not asked the question were recoded neutrally between "Fairly confident" and "Not very confident."

AD_Q03 and AD_Q05	Anyone in household has registered retirement savings, anyone in household has registered education savings	Participants responding "don't know" and non-respondents were recoded as "No."
EF_Q02 RP_Q01 FC_Q07b to e FC_Q09 FC_Q10	Saving for child's education? Saving for retirement? Insurance coverage Have a will? Have powers of attorney	Participants responding "don't know" and non-respondents (including participants to whom the questions were not asked) were recoded as neutral between Yes and No.
RP_Q09	Understanding of money needed to retire	Participants who were not asked this question were recoded as neutral between Yes and No. Participants who said "Don't know" and non-respondents were recoded as "No."
INS_N	A new variable was derived from the original questions FC_Q07A through H on ownership of different insurance types: how many types of insurance do participants have?	Participants responding "yes" to one or more of the original questions were recoded to give a sum total for the number of affirmative answers (banded at 2+ types of products).
Choosing products		
FM_G04A FM_G04B FM_G04C	Frequency of using pawnbroker, payday lender and cheque casher	Non-respondents were recoded as "Never."
SA_Q04 SA_Q10 SA_Q12 SA_Q13	Self-assessment on shopping around on financial products, confidence about personal product needs, confidence about investments, use of research in decision-making	Participants responding "don't know" and non-respondents were recoded neutrally between "Very good " and "Good" and "Disagree" and "Agree."
OA_Q04 OA_Q05	Knowledge question on unit pricing and on life insurance	Incorrect answers and non-response coded as incorrect (0).
OA_Q06	Knowledge of interest on deposit accounts	Two correct answers accepted (may not be taxed, may be taxed depending on other income), other answers coded as incorrect (0).
FC_Q08	Concentration of insurance with one provider	Participants responding "don't know" recoded as "yes," participants who were not asked this question and non-respondents recoded as neutral between "yes" and "no."
OE_D02	Total number of bank accounts	Participants with more than one account were recoded as having an account (turns the continuous variable into a categorical variable).
OE_G03	Number of institutions holding bank accounts	Participants who were not asked this question and non-respondents were recoded as responding "1."
Staying informed		
NProd	A new variable was derived from the questions FC_Q01A through I asking about the use of advice on different financial products; how many topics did participants seek advice on?	Participants responding "yes" to one or more of the original questions were recoded to give a sum total for the number of affirmative answers.

NAdvice	A new variable was derived from the questions FC_Q02A through P asking about sources of advice used: how many sources of advice did participants use?	Participants responding "yes" to one or more of the original questions were recoded to give a sum total for the number of affirmative answers.
NInfo	A new variable was derived from the questions FC_Q04A through H asking about sources of information on financial matters: how many sources of information did participants use?	Participants responding "yes" to one or more of the original questions were recoded to give a sum total for the number of affirmative answers.
NEye	A new variable was derived from the questions FC_Q05A through J asking about financial topics monitored, how many topics do participants monitor?	Participants responding "yes" to one or more of the original questions were recoded to give a sum total for the number of affirmative answers.
NHow	A new variable was derived from the questions FC_Q06A through H asking how topics are monitored: how many ways do participants monitor financial topics?	Participants responding "yes" to one or more of the original questions were recoded to give a sum total for the number of affirmative answers.
SA_Q01 and SA_Q05	Self-assessed financial knowledge and ability on staying informed	Participants responding "don't know" were recoded as "Not very good."
SA_Q11	Self-assessment on keeping watch on personal finances	Participants responding "don't know" were recoded as "disagree."

4.2 Analysis of Factor Scores

4.2.1 Descriptive Statistics

The following table shows the average values of the factor scores by a wide range of characteristics.

Table 8   Average Values for Each Financial Capability Score (Range 0 … 100)

	Making ends meet	Keeping track	Planning ahead	Choosing products	Staying informed
All	81.9	65.5	60.8	69.9	39.4
Age group – 7 categories					
18-24	80.5	60.1	43.6	61.4	32.7
25-29	78.6	67.5	58.2	69.2	39.4
30-39	79.8	68.4	64.3	70.6	41.8
40-54	80.9	66.9	66.8	71.7	41.8
55-64	84.5	66.6	65.8	73.4	42.1

	Making ends meet	Keeping track	Planning ahead	Choosing products	Staying informed
65-74	85.7	64.1	56.9	72.1	37.1
75+	86.9	59.3	54.1	65.6	30.5
Age group – 3 categories					
18-29	79.7	63.3	49.8	64.7	35.5
30-64	81.4	67.3	65.9	71.8	41.9
65+	86.2	62.0	55.7	69.3	34.4
Male	82.1	65.2	62.7	71.0	41.0
Female	81.7	65.9	59.0	68.8	37.8
Aboriginal	75.7	63.6	54.3	62.8	34.2
Born in Canada non-Aboriginal	82.5	65.8	62.2	71.2	39.9
Not born in Canada, immigrated before 1980	84.5	65.0	62.6	70.5	39.5
Not born in Canada, immigrated between 1980-1998	79.2	63.9	55.9	65.4	37.6
Not born in Canada, immigrated between 1999-2009	78.7	66.2	51.4	63.2	37.3
Home-owner	83.3	65.9	65.0	72.2	41.2
Non-owner	78.0	65.6	50.2	65.2	34.7
Less than a high school diploma	80.2	60.4	49.3	62.9	28.7
High school diploma or equivalent	81.3	63.7	58.0	68.3	36.1
Some college, university without degree	80.8	65.8	56.8	69.1	38.8
College, trade, vocational or technical school	81.3	67.0	64.4	72.0	41.0
University undergraduate degree	83.8	68.3	67.4	73.5	45.6
University graduate degree (including professional degrees)	85.0	69.2	70.3	74.5	48.6
Course/programme on financial matters	81.8	68.8	62.9	72.1	46.5
No such course	81.9	65.1	60.5	69.6	38.3

	Making ends meet	Keeping track	Planning ahead	Choosing products	Staying informed
Employed	81.5	67.4	67.5	71.4	41.4
Self-employed	82.5	65.4	69.6	74.3	45.2
Unemployed	73.6	63.9	46.7	63.5	36.3
Inactive	83.8	63.2	51.0	67.7	35.1
Income quintiles					
Less than $32,001	79.1	63.0	45.5	63.9	30.0
$32,001 - $54,999	79.9	65.0	55.7	68.5	36.6
$55,000 - $79,999	81.9	66.8	62.5	71.1	40.2
$80,000 - $119,999	83.1	66.5	67.6	72.1	42.8
$120,000 and over	85.4	66.5	72.7	73.9	46.9
Net worth quintiles					
Less than $9,999	72.6	65.8	40.4	62.7	31.5
$10,000 to $119,999	80.2	68.8	60.1	71.6	38.7
$120,000 to $305,999	83.1	69.0	68.0	75.7	42.3
$306,000 to $625,999	85.4	69.1	72.4	77.3	46.4
$626,000 and over	87.7	68.0	77.6	79.9	52.6
Region					
Atlantic	81.6	65.6	57.8	70.1	37.1
Quebec	82.9	67.8	59.6	69.8	37.7
Ontario	81.2	65.2	60.5	69.1	39.7
Manitoba and Saskatchewan	81.7	63.3	63.6	69.6	38.4
Alberta	81.9	65.0	65.1	71.7	42.6
British Columbia	82.3	64.2	60.7	70.9	40.5

4.2.2 Linear Regressions of Each Factor Score

Tables 9 and 10 show the main results for linear regressions of the five domains of financial capability.

Table 9   Regression Analysis of First 3 Domains of Financial Capability

		Linear regression models	
	Making ends meet	**Keeping track**	**Planning ahead**
R-squared	.235	.078	.528
Male	.44	-.66 *	.51
Female	-.43	.64 *	-.50
Age	-.24 **	.24 ***	.31 ***
Age-squared (/100)[17]	.33 ***	-.31 ***	-.14 *
Aboriginal	-4.03 ***	-.67	-.87
Region (cf National average)			
Atlantic	.22	.14	-.54
Quebec	1.93 ***	1.02 **	.05
Ontario	-1.0 *	-.20	-.56
Manitoba & Saskatchewan	.33	.68	.03
Alberta	-.42	.54	.58
British Columbia	-.43	.34	02
Non-home-owner	-1.04 **	-.38	-2.59 ***
Education			
Less than high school	-.23	-4.13 ***	-3.20 ***
High School	.35	-2.14 ***	-.68
Some post-secondary (the reference group)	0.0	0.0	0.0
Diploma or degree	1.35 **	.48	1.98 **
Economic status			
Employee (reference group)	0.0	0.0	0.0
Self-employed	-1.3 *	-2.57 ***	-1.08
Unemployed	-5.33 ***	-.35	-12.01 ***

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17 Age-squared is included in the model to allow for a non-linear or curved association between age and financial capability. The division by 100 simply makes the output easier to read and interpret.

Inactive	1.43 **	-.42	-13.98 ***
Single (compared with couples)	-.68 *	-1.98 ***	-1.66 ***
Has children under 18	-2.77 ***	.84 *	-.46
Lowest *income*	-2.09 ***	-.25	-9.82 ***
Quintile 2	-2.74 ***	-.30	-4.19 ***
Quintile 3 (reference gp)	0.0	0.0	0.0
Quintile 4	1.48 **	-1.01	3.75 ***
Quintile 5	3.67 ***		6.31 ***
Lowest *wealth*	-8.64 ***	-1.63 **	-15.14 ***
Quintile 2	-2.10 ***	.23	-3.64 ***
Quintile 3 (reference gp)	0.0	0.0	0.0
Quintile 4	1.32 **	.45	2.67 ***
Quintile 5	2.77 ***	-.14	5.46 ***
(Constant)	86.03	65.47	61.79

Levels of statistical significance: * = 5%, ** =1%, *** = 0.1%.

Table 10   Regression Analysis of the Other 2 Domains of Financial Capability

	Linear regression models	
	Choosing products	**Staying informed**
R-sq	.227	.273
Male	.58	.99 **
Female	-.56	-.96 **
Age	.38 ***	.26 ***
Age-squared (/100)	-.34 ***	-.30 ***
Aboriginal	-3.74 ***	-1.85
Region (cf National average)		
Atlantic	1.05	.10
Quebec	4.44 ***	.57
Ontario	-.43	-.09
Manitoba & Saskatchewan	2.96 ***	.38
Alberta	1.91 **	.58
British Columbia	1.48 **	.19
Tenant	-1.54 ***	.22

Education		
Less than high school	-4.47 ***	-7.57 ***
High School	-1.81 **	-3.62 ***
Some post-secondary (ref)	0.0	0.0
Diploma or degree	.83	1.84 **
Economic status		
Employee	0.0	0.0
Self-employed	.97	1.92 ***
Unemployed	-2.86 ***	1.23
Inactive	-.13	-.61
Single (compared with couples)	-1.51 ***	-.07
Has children aged<18	-.17	-.10
Lowest *income*	-2.73 ***	-5.38 ***
Quintile 2	-.64	-1.10
Quintile 3 (ref)	0.0	0.0
Quintile 4	-.18	2.16 ***
Quintile 5	.53	4.23 ***
Lowest *wealth*	-8.52 ***	-6.23 ***
Quintile 2	-2.40 ***	-1.96 **
Quintile 3 (ref)	0.0	0.0
Quintile 4	.72	3.12 ***
Quintile 5	2.37 ***	7.48 ***
(Constant)	55.16	38.68

Levels of statistical significance: * = 5%, ** =1%, *** = 0.1%.

4.3 Logistic Regression of Whether Saving for Children's Post-secondary Education

Table 11   Regression Analysis of Whether Saving for Children's Education

			Logistic regression
Variable	**Coefficient**	**Wald**	**Significance**
Factor scores			
Making ends meet***[18]	.014	29.337	.000
Planning ahead***	.025	166.638	.000
Choosing products*	-.006	4.073	.044
Staying informed***	.020	64.230	.000
Aboriginal*	-.446	6.378	.012
Region		76.552	.000
Atlantic	-.041	.080	.778
Quebec***	-.710	60.661	.000
Ontario (ref)	0.0		
Manitoba & Saskatchewan*	-.421	8.156	.004
Alberta	.116	.878	.349
British Columbia*	-.267	5.470	.019
Education		23.143	.000
Less than high school	-.158	1.028	.311
High School	-.065	.251	.617
Some post-secondary (ref)	0.0		
Diploma or degree*	.279	5.939	.015
Has dependent children now*	.288	6.568	.010
Constant	2.366	71.682	.000

The following variables were dropped from the model because they had low explanatory power: keeping track (factor score); gender, age, income, labour force status.

4.4 Subjective and Objective Assessments of Financial Matters

In addition to these four key domains of financial capability, there is another set of questions that may be regarded as strongly linked, and representative of a smaller number of underlying traits. These are the questions on subjective assessments. A factor analysis of

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18   Levels of statistical significance: * = 5%, ** =1%, *** = 0.1%.

those questions is shown in Table 12, and shows that there seem to be two underlying concepts at work: first, a general attitudinal stance, and second, a perspective linked to consulting family and friends, and whether professional financial advice is trusted.

In the UK analysis, scores based on these kinds of attitudes were included in the analysis of the main domains of financial capability. However, for the Canada analysis the emphasis was on looking at individual questions. The set of subjective attitudes is too varied to be particularly useful as a set.

Table 12   Factor Analysis of Attitude Questions – Two Key Factors

	1	2
SA_Q05 Staying informed on financial issues	.727	-.136
SA_Q01 Level of financial knowledge	.673	-.207
SA_Q02 Keeping track of money	.656	
SA_Q04 Best finan product-loans/ins rates	.628	
SA_Q12 Ag/Dg-Suitable for circumstances.	.584	
SA_Q10 Ag/Dg clear idea of finan prod needed	.581	
SA_Q03 Making ends meet	.542	
SA_Q07 Ag/Dg-enjoy dealing with finan matters.	.541	
SA_Q11 Ag/Dg-Close personal watch on finan aff	.531	.185
SA_Q13 Ag/Dg-always research my choices	.503	.350
SA_Q14 Ag/Dg-consult family/spouse making finan		.655
SA_Q09 Ag/Dg-freq get finan adv from fri/fam		.629
SA_Q06 Later regretted finan decision		-.386
SA_Q08 Ag/Dg-trust profes finan adv		.312

Model summary: KMO = 0.85. Variance explained by first factor: 33%.

Reliability Analysis of the Objective Questions

A set of 14 questions aimed to tap into people's objective knowledge. These questions covered a variety of topics, from the riskiness of stocks to the effects of inflation, to use of ATM cards. For each question one (or, in the case of question OA_Q06, two) responses are considered to be correct according to the survey design. A technique known as reliability analysis enables an exploration of whether these questions appear to be measuring a trait of financial knowledge, or instead are picking up several influences. A measure of overall reliability, Cronbach's alpha, indicated that the overall list of 14 questions is reliable (alpha = 0.814, a relatively strong level of reliability in social science).

Analysts seeking to make use of these findings should therefore consider if they need an overall score – in which case, all the questions form a reliable scale – or if the individual questions are of specific interest in their own right. The total question score on objective knowledge formed part of the factor score for staying informed, whilst individual questions were used to help inform some of the other measurements of financial capability.

Table 13   Reliability Analysis of Objective Knowledge Questions

(Overall alpha = 0.814, all items)

Objective questions	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Q1 (real interest)	7.46	10.4	.48	.799
Q2 (credit report)	7.67	10.7	.69	.806
Q3 (stocks)	7.75	11.1	.28	.814
Q4 (unit pricing)	7.39	10.8	.38	.806
Q5 (insurance)	7.34	10.6	.48	.799
Q6 (bank interest)	7.39	10.3	.55	.794
Q7 (inflation effects)	7.57	10.6	.42	.804
Q8 (safe account)	7.47	10.7	.40	.805
Q9 (inflation protection)	7.72	11.0	.31	.812
Q10 (when to borrow)	7.83	11.1	.32	.811
Q11 (ATM cards)	7.40	10.4	.50	.797
Q12 (credit rating)	7.24	10.5	.63	.791
Q13 (loan interest)	7.41	10.6	.45	.801
Q14 (house cost)	7.26	10.5	.62	.791

Reliability analysis of the objective knowledge questions.

4.5 Cluster Analysis

Cluster analysis aims to assign respondents (or some other set of observations) into subsets. Those within each subset (or cluster) will share some characteristics with people allocated to other clusters, but differ in some other respects. Cluster analysis requires a measure of "distance" between observations (how different they are), and a means of either grouping or separating individuals until they are within defined cluster boundaries.[19] A common application of cluster analysis is to try to group households into different kinds of neighbourhoods. Those involved in marketing are often interested in splitting people into various kinds of groups who may be approached in different ways.

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19   "Agglomerative" approaches treat each person separately and then merge them into larger groups; "divisive" approaches start with just one group and then divide it into successively smaller groups.

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