HOW FINANCIAL LITERACY IMPACTS FINANCIAL DECISIONS FOR BUSINESS OWNERS OF BOTH GENDERS IN CANADA

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Thesis submitted to the University of Ottawa
in partial fulfillment of the requirements for the
Master of Science in Management

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Abstract

The difference in financial literacy among business owners may affect how financial decisions are made, especially when comparing between women and men. Using role congruity theory as the theoretical framework, the objective of this study is to examine how financial literacy, composed of financial knowledge and financial confidence, differs in influence in the decision-making process of financial decisions between self-employed women and self-employed men. Based on data from the 2014 Canadian Financial Capability Survey (CFCS), results show that self-employed women and self-employed men have equivalent financial knowledge. In addition, while self-employed women have less financial confidence than self-employed men, self-employed men are more overconfident than self-employed women, both groups are, in general equally likely to make risky (bad) decisions. This suggests that financial confidence plays an important role as financial knowledge does in the decision-making process.

Acknowledgements

Foremost, I would like to thank my thesis advisor Prof. Dr. Allan Riding whose expertise and unlimited patience guided me through this process. His continuous support, encouragement and knowledge helped me in all the time of researching and writing of this thesis. I could have not asked for a better advisor and mentor for my master's degree.

I would also like to express my gratitude to Prof. Miwako Nitani for extended discussions and valuable suggestions which have contributed greatly to my thesis. I am also hugely appreciative to Prof. David Crick for his hard questions and great feedback.

I would like to thank my fellow master students Shuyang, Lulu, Khaloua and Jennifer for their feedback, cooperation and of course friendship. In addition, I would like to express my gratitude to the staff of the Graduate Students Office for all the last-minute favours.

I would like to express my profound gratitude to my parents and my family back in Brazil whose love and guidance are with me in whatever I pursue. Finally, I must express my very utmost gratitude to my wife Priscila for embarking with me on this journey and providing me with unfailing support in life and writing this thesis.

Contents

List of tables and list of figures

1 Introduction

1.1 Research questions

According to Innovation, Science and Economic Development Canada (ISED, 2015) small and medium-sized enterprises (SMEs) owned by a majority of women differ from SMEs owned by a majority of men, in several respects. Women-owned SMEs tend to employ fewer people, to grow less rapidly, to present lower growth intentions, to be concentrated in services sectors and to be more likely to be discouraged with respect to borrowing capital. These are not new findings, nor are they unique internationally (Fairlie & Robb, 2009; Rosa, Carte and Hamilton, 1996; Sabarwal & Terrell, 2008). Previous research has credited this difference to such factors as women's traits and their choices, their business strategies and environmental constraints, and to the industries in which women-owned enterprises are concentrated (Rosa & Sylla, 2016). This research advances an alternative explanation for some of these differences.

This study considers well-documented gender differences in financial knowledge as an additional potential factor behind gender differences in performance and access to capital, because women are, on average, less financially knowledgeable than men (Lusardi & Mitchell, 2011; Xu & Zia, 2012).[1] This is a common, indeed, almost universal, finding among researchers. Other

[1] A clarification of terminology is important. The term "financial knowledge" reflects the cognitive aspects about what people know about finance. Another often-used term, "financial self-efficacy," reflects the degree with which people have confidence in their understanding of finance but does not connote actual financial knowledge. The term "financial literacy" reflects the combination of financial knowledge and financial confidence, as well as other aspects such as the ability to communicate about finance, etc. (see Remund, 2010).

research findings have shown that women are less confident than men with respect to their financial knowledge (Bucher-Koenen et al., 2017; Chen & Volpe, 2002; Lusardi & Mitchell, 2011). Some researchers contend that gender stereotypes may affect this perception (Schubert et al., 1999) or that differences in confidence may reflect task context (Jakobsson, Levin, & Kotsadam, 2013; Lundeberg, Fox, & Puncochar, 1994; Niederle & Vesterlund, 2007).

These findings beg the question of whether gender differences in terms of performance, size, and growth relate to gender differences in financial knowledge, financial self-efficacy or both. Asaad (2015) and Allgood & Walstad (2016) illustrate that financial knowledge and financial confidence impact individuals' financial behaviour: on the one hand, women are less financially knowledgeable; however, the impacts of low financial knowledge may be mitigated by higher levels of risk aversion among women. These observations prompt three research questions.

1 Given that, on average, women in general are less financially knowledgeable than men, does this gender difference persist among *business owners*?

2 Given that men, on average, are more financially confident than women, to what extent does this gender difference persist among business owners? That is, do women business owners exhibit as much financial self-efficacy as business owners who are men?

3 To what extent do risk aversion, financial knowledge and financial self-efficacy relate to business owners' financial decision making and to what extent do such decisions differ by gender?

1.2 Importance of this work

The importance of this study derives from several sources. First, and from a societal perspective, self-employment is increasingly the norm; moreover, financial knowledge is increasingly a necessary life skill. People are living longer even as the value of pensions and health benefit plans

are eroding. Employers are moving away from defined benefit pension plans, leaving employees to bear more of the responsibility for husbanding financial resources for retirement. Recent research, however, has documented that financial knowledge is generally low—and is a problem in both developed and lesser developed nations (Bucher-Koenen et al., 2017; Chen & Volpe, 2002; Lusardi & Mitchell, 2011). Understanding basic financial concepts allows people to make well-informed financial decisions in increasingly more complex financial settings. Examples include that:

- Financial literacy is associated with "savvier saving and investment decisions, better debt management, more retirement planning, higher participation in the stock market, and greater wealth accumulation" (Lusardi & Mitchell, 2013, p. 34).
- Failures among SMEs have been linked directly to poor financial management (Thornhill & Amit, 2003).

The societal context for these issues is described by the World Economic Forum, in its "Global Risks Report 2017" (2017, p. 7), which states:

> *…social protection systems are at [the] breaking point … underfunding of state systems is coinciding with the decline of employer-backed social protection schemes… while technological change means stable, long-term jobs are giving way to self-employment ….*

In particular, financial illiteracy is especially problematic among women because, on average: women tend to live longer than men, have shorter careers due to childbearing, and earn lower levels of income. Senior single women, especially those who are divorced, have considerably less wealth than do married couples or single men (Fonseca, Mullen, Zamarro, & Zissimopoulos, 2012). Lower levels of wealth, accompanied by fewer financial skills, may jeopardize women's

retirement period. Financial knowledge is arguably associated with relevant financial outcomes, including wealth accumulation (Bannier & Schwarz, 2018).

Analogous to the work of Asaad (2015), who reports that financial knowledge and confidence influence financial behaviour, this paper contributes to the existing literature by using Canadian survey data to examine financial decisions among business owners, the relationship between gender differences in financial knowledge and gender differences in financial self-efficacy. Moreover, this research focuses on business owners, self-employed individuals, who—we contend—are relatively more financially knowledgeable and confident than average and among whom gender differences in financial knowledge and financial confidence are arguably normalized. In the manner of Asaad (2015), we distinguish individuals characterized by low knowledge but high financial self-efficacy (overconfidence), as well as those with low financial self-efficacy but high financial knowledge (under-confidence) to consider gender differences among self-employed individuals with respect to decision-making. Therefore, we seek to predict if self-employed women are more risk-averse than self-employed men and would make more or fewer poor financial decisions.

The theoretical framework for this research rests on role congruity theory (RCT). RCT is a paradigm that argues women entrepreneurs are seen as less successful than men entrepreneurs because of the lack of congruence between the female gender role and the role of the entrepreneur (Malmström et al., 2017). This work will draw on RCT to develop testable hypotheses about the relationships between financial knowledge and financial self-efficacy on financial behaviours. To address the research questions empirically, this study uses data from a large-scale survey of the Canadian population: the 2014 Canadian Financial Capabilities Survey (CFCS). This iteration of

the CFCS constitutes a stratified survey of the Canadian population, including a substantive number of self-employed individuals.

Scholars have demonstrated that financial education programs have a significant impact on individuals' financial behaviour, specially women, who are relatively more keen to change their financial behaviour (Bucher-Koenen et al., 2017; Clark, D'Ambrosio, McDermed, & Sawant, 2006; Annamaria Lusardi, Keller, & Keller, 2009) The findings of this work will potentially inform policymakers about interventions to reduce salient differences between men and women, and if it is the case, men and women business owners.

2 Review of the literature

2.1 Terminology and overview

Lusardi, Michaud, & Mitchell (2017) define financial knowledge as awareness and understanding of information about financial matters and practices that have been acquired by experience or study throughout life. Financial knowledge is the cognitive element among several concepts that collectively comprise the broader understanding of "financial literacy:" "having the knowledge, skills and confidence to make responsible financial decisions" (Financial Consumer Agency of Canada, 2014).

A related term is that of financial self-efficacy, which essentially relates to an individual's level of confidence regarding his or her financial skills. Financial self-efficacy is important because it touches on several finance-related issues, including gender-specific attitudes toward financial management (Amatucci & Crawley, 2011) and gender differences in: investment risk taking (Montford & Goldsmith, 2016), wealth accumulation (Bannier & Schwarz, 2018), and portfolio choices (Chatterjee, Finke, & Harness, 2011). Women with higher levels of financial self-efficacy tend to hold more investment and savings products, while women with lower financial self-efficacy tend to hold debt-related products (Farrell, Fry, & Risse, 2016). Amatucci & Crawley (2011) note that self-efficacy and the threat of stereotyping are related when negative stereotypes can undermine confidence and create a self-fulfilling prophecy such that an individual is unable to perform a task. Financial self-efficacy impacts financial literacy and both are related to personal characteristics such as character, family history, social and cultural norms, etc. (Montford & Goldsmith, 2016).[2]

[2] Understanding the differences in this terminology (financial literacy, financial knowledge, and financial self-efficacy) is paramount to the comprehension of the problem. Because a misinterpretation may lead to

The consensus of the literature is that objective financial knowledge is generally low and varies with age, ethnicity, gender and education (Allgood & Walstad, 2016; Clark, 2014; Hilgert, Hogarth, & Beverly, 2003; Lusardi & Mitchell, 2007, 2008, 2009, 2011, 2014; Xu & Zia, 2012). Only one-third of the U.S. population understands the basics of interest compounding (Lusardi and Tufano, 2015). Scant published research considers the state of financial knowledge among self-employed individuals.

2.2 Gender differences in financial literacy

Virtually every study of financial literacy has found that men outperform women in tests of financial knowledge. In an early study, Chen & Volpe (2002) report a gender gap after controlling for other characteristics such as participants' education, class rank, work experience, and age. Fonseca, Mullen, Zamarro, & Zissimopoulos (2012) argue that the gender gap is not a result of different traits between men and women; rather, that financial knowledge reflects how knowledge is acquired. Bongini, Trivellato, & Zenga (2015) suggest that a gender gap can be overcome by personal interest. Nonetheless, research has yet to explain the gender gap (Lusardi & Mitchell, 2013).

Furthermore, financial illiteracy has a greater impact on women, who tend to have shorter careers and lower earnings than men and, therefore, women may be more likely to face financial

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the presumption that these terms have interchangeable meanings when in fact, they do not. While financial knowledge can be measured by objective test score and financial self-efficacy can be measured by self-rating survey; financial literacy is [should be] a combination of both constructs. One facet of the research is that women are more likely than men to confess that they do not know the answer to a question whereas men are relatively more likely to guess (this result implies that women may be a better target for financial literacy programs (Bucher-Koenen, Lusardi, Alessie, & van Rooij, 2017)).

difficulties. Additionally, women have a longer life expectancy, they are relatively more likely to be unmarried (widowed or divorced) in their retirement and will need additional savings. Moreover, Lusardi & Scheresberg (2017) report that women are less likely to plan and two-thirds express concerns about money during retirement.

Research also agrees that women are perceived to be more risk averse than men (Croson & Gneezy, 2009). On average, women are relatively more prone to investing in lower risk investments that will culminate in low rates of return (Wang, 2009), are less likely to invest in stocks (Sunden & Surette, 1998), and are risk averse regarding gambling choices (Eckel & Grossman, 2008). However, some researchers observe that competence, overconfidence, and knowledge reduce the gender gap in risk aversion (Gysler, Brown Kruse, & Schubert, 2002) and both men and women's degree of risk aversion are influenced by the framing of financial decisions. Similarly, Beckmann & Menkhoff, (2008) believe that awareness of risk and risk decisions under financial setting promote the reduction of gender differences in risk propensity.

While men are more likely to be more overconfident than women, the gender gap in overconfidence may be task dependent and subject to whether or not the task domain is male- or female-oriented (Barber & Odean, 2001; Beyer & Bowden, 1997; Jakobsson, 2012; Jakobsson et al., 2013; Lundeberg et al., 1994; Niederle & Vesterlund, 2007). Women have been found to be relatively less confident in the corporate setting (Huang & Kisgen, 2013), in answering sports trivia (Beyer & Bowden, 1997) and in their mathematics grades, either being schoolgirls (Jakobsson et al., 2013) or undergraduate women (Lundeberg et al., 1994). In contrast, Biais, Hilton, Mazurier, & Pouget (2005) did not observe a correlation between overconfidence and gender.

According to Hilton, Régner, Cabantous, Charalambides, & Vautier (2011) "overconfidence is not a unitary construct, but a series of overlapping ones". Moore & Healy (2008) argue that overconfidence can be described by three specific concepts:

1. Over-estimation: where people overestimate their actual ability, performance, level of control, or chance of success;

2. Over-placement: where individuals believe themselves to be better than others (also known as the better-than-average effect); and,

3. Over-precision: where people overestimate the precision of their knowledge.

Moreover, Moore & Healy (2008) present three common problems with the study of overconfidence:

1. confusion between overestimation and over-precision;
2. the presence of under-confidence; and,
3. a not so predictable relationship between overestimation and over-placement.

Moore & Healy (2008) have identified that people are not generally aware of their own performance, ability, or chance of success and that their estimations thereof are regressive. At the same time, people are even less aware of others and their estimations of others are even more regressive (Moore & Healy, 2008). As a result, when faced with hard tasks, one tends to overestimate one's own performance (being overconfident), overestimate others even more, and thus produce worse-than-average effect perceptions. On the other hand, when faced with easy tasks, one tends to underestimate one's own performance (be underconfident), underestimate others even more, and in effect produce better-than-average effect perceptions (Hilton et al., 2011; Larrick et al., 2007; Moore & Healy, 2008).

Moreover, it is also interesting to notice that the unwillingness to acknowledge one's own illiteracy is congruent with men overconfidence. Data from previous surveys demonstrate that men and boys are more likely to guess at an answer to a question whereas women and girls are more prone to answer 'I don't know' (Linn & Petersen, as cited in Lundeberg et al., 1994; Lusardi & Mitchell, 2013). Therefore, these findings lead to some interesting questions when differentiating between "laypersons" and business owners:

- Are women business owners less overconfident than men business owners?
- Are women business owners more risk averse than men business owners and consequently less likely to make bad decisions?
- Assuming a gender gap in financial knowledge, does women's tendency towards conservatism compensate for lack of knowledge?

3 Conceptual elements

3.1 Self-employment and financial knowledge

Drawing from theories of experiential learning among entrepreneurs, this section argues that self-employed workers whose firms survive gain financial knowledge on the job to a greater extent than do employees. These theories begin with the "liability of newness" concept (Stinchcombe, 1965) which implies that failures among early-stage firms reflect a lack of knowledge because of the novelty of learning experiences and a lack of trust relationships among stakeholders. Jovanovic (1982, p. 649) adds that in the context of imperfect information owners of "[new] firms learn about their efficiency as they operate in the industry:" some owners are better able than others to learn but inferior firms are eliminated by natural selection (Baldwin & Rafiquzzaman, 1995). This perspective of firm growth regards the survival and growth process as a journey in learning during which business owners learn by overcoming different organizational, operational, and financial risks.

Moreover, self-employed individuals not only manage their own personal finances—as do employees—they also manage finances and transactions associated with their enterprises, activities that employees do not typically face. Poor financial management can lead directly to business failure, directly impacting owners' personal wealth, as well as the survival of the enterprise. Empirical findings to this effect are evident in the findings of Thornhill & Amit (2003) who report that poor financial decisions are a primary cause of failures among young Canadian businesses. Hence, the survival of firms implies relatively higher levels of experiential learning and greater financial knowledge among self-employed compared to employees. The first hypothesis articulates this expectation:

H_1: Financial knowledge differs by occupational role such that, on average, the financial knowledge of self-employed individuals exceeds that of employees.

3.2 Gender and financial knowledge

The "family embeddedness" perspective of learning suggests that financial decisions take place within family systems (Aldrich & Cliff, 2003) and that financial discussions reflect household and family role expectations (Welter, 2011). The research literature generally recognizes that financial knowledge is rooted in childhood experiences and education. This includes socialization about financial matters within birth families with attitudes to financial knowledge that extend throughout maturation (Falahati & Paim, 2011), education, the workplace (Hibbert, Lawrence, & Prakash, 2013; Turner & Bowen, 1999), and into retirement and widow(er)hood (Bucher-Koenen, Lusardi, Alessie, & Rooij, 2014). From a theoretical perspective, and also within the family embeddedness context, Agnew and Cameron-Agnew (2015) report that men typically experience their first financial discussion within a household much earlier than do women. Clarke, Heaton, Israelsen, and Eggett (2005) argue that prototypical stereotypes of men as 'breadwinners' and women as 'homemakers' are exhibited in the modelling of financial roles at an early age. Thus, gender role expectations align with the common finding in which women score lower on tests of financial knowledge compared to men (OECD, 2016; Xu and Zia, 2012).

However, research has not yet considered the extent to which gender differences in financial knowledge persist across occupational roles. For the survival of men's and women's firms, financial knowledge among self-employment survivors must reach a minimum level. Self-employed women have greater motivation and greater opportunity to acquire financial knowledge than do employed women. Therefore, it is argued that the gender gap in financial knowledge among self-employed individuals is, because of natural selection, smaller than that among employees. This leads to additional hypotheses:

H_2: Self-employed men have, on average, higher financial knowledge than self-employed women.

H_3: The gender gap, if any, in financial knowledge among self-employed individuals is smaller than that among the benchmark category consisting of men and women employees.

3.3 Role Congruity Theory, gender and differences in financial knowledge

Gender roles can be defined as the set of common beliefs about the characteristics of men and women. These beliefs consist of expectations of what men and women are (*descriptive norms* or *descriptive stereotypes*) and expectations of how they *should* behave (*injunctive or prescriptive norms* or *prescriptive stereotypes*). Men and women are believed to diverge on social (*communal*) and achievement-oriented (*agentic*) traits (Bakan, 1966), such that agentic qualities – aggressive, independent, decisive, and dominant – are attributed more to men, and communal qualities – kind, supportive, unselfish, and helpful – are attributed more to. These qualities are seen as antagonistic to each other and what is considered to be desirable to men has the opposite effect on women, and vice versa (Gupta & Bhawe, 2007). Gender stereotypes not only determine what men and women are but also how they should behave (Burgess & Borgida, 1999).

In terms of congruity theory, Eagly & Karau (2002) expand social role theory to examine the convergence between gender roles and leadership roles, to determine what contributes to the awareness of this congruence and its ramifications for bias and harmful behaviours. In this way, due to a lack of congruence of being a woman, associated with communal traits, with leadership, identified with agentic traits, two types of prejudices may arise:

1. Women will have an unfavourable assessment with respect to becoming leaders in comparison to men;

2. When leaders, women will be more severely judged than men.

This tendency leads to a paradoxical situation where if women comply with their gender role, they will not fulfil the leader's role prerequisites; and, if they comply with the leader's role prerequisite, they will fall short on their gender role. These prejudices tend to result in fewer opportunities for women to become leaders and more interference for women to succeed as leaders.

Eddleston, Ladge, Mitteness, & Balachandra (2016) assert that when a participant of a stereotyped social group is linked with a conflicting social role, this leads to a discrepancy in the observer's mind that negatively affects the assessment of that person. Accordingly, when a group of people realize that there is no congruity among their traits and the stereotype identified with a specific task, their purpose to seek that task is curtailed in comparison to a group of people with attributes similar to those of the stereotype (Gupta & Bhawe, 2007). Nonetheless, when women have success in a male gender-typed domain, this is perceived as a violation of the prescriptive norms and can have detrimental results, such as being disliked and personal depreciation (Heilman, Wallen, Fuchs, & Tamkins, 2004).

Within a family unit, and in Western societies, men tend to specialize in financial decisions more often than women do (Fonseca, Mullen, Zamarro, & Zissimopoulos, 2012), and men tend to be those who respond to financial surveys (Smith, McArdle, & Willis, 2010) because the financial decision making role is seen as an agentic trait in Western societies. Therefore, the relationship between the role congruity theory and financial literacy implies that when a woman and an incongruent role (financial decision maker) are associated in an observer's mind, the woman will be seen less favourably than a man. Thus, this might help explain the gender gap in financial knowledge and presents a fourth and a fifth hypothesis:

H_4: Even though they might be involved in financial management on a daily basis, self-employed men have, on average, higher financial self-efficacy than women counterparts.

H_5: However, because self-employed women would see themselves in an incongruent role (financial decision maker), there is no significative difference in financial self-efficacy between self-employed women and employed women.

3.4 Gender differences in overconfidence

Overconfidence can be defined as when the actual ability or knowledge of an individual falls short of meeting one's own expectations (Porto & Xiao, 2016). This miscalibration happens, partially, because when one does not possess the knowledge or ability in a certain domain, he or she lacks the competence to recognize it (Kruger & Dunning, 1999). Cordell, Smith, & Terry (2011) showed that financial planners with a lower level of skills are more overconfident than financial planners with a higher level of skills. Moreover, overconfidence reduces one's awareness of the risk of a project (Russo & Schoemaker, 1992). Simon, Houghton, & Aquino (2000) showed that entrepreneurs, more often than not, launch a business without realizing all the risks, and not because they are high risk-takers; however, the correlation of overconfidence and risk perception was not significant.

The act of risk-taking does not imply an inferior judgment. However, when combined with overconfidence, it can lead to a costly outcome, except if relates solely to low confidence domains (Campbell, Goodie, & Foster, 2004). In their empirical work with fund managers, Beckmann & Menkhoff (2008) demonstrated that, although not showing any difference in performance, when controlled for financial expertise, women tend to be more risk-averse, avoid competition

behaviour, and be less overconfident, albeit the latter trait was not significant. This leads us to our sixth hypothesis:

H_6: *Given that women tend to be more risk-averse than men, self-employed women are less likely to be overconfident than self-employed men.*

Previous research has found that women are less overconfident than men in male-oriented domains, however, this difference does not mean poor performance. Fennema & Sherman (1978) disclose that despite attaining higher or equal scores in mathematical tests than boys, schoolgirls would underestimate themselves. Furthermore, Goel & Thakor's (2008) theoretical model predicts that a risk-averse CEO reduces firm value when they are underconfident, but increases firm value when they are overconfident, until it becomes detrimental by exceeding the risks, thus it is preferable to "have a CEO who is overconfident but not too overconfident"(Goel & Thakor, 2008, p. 2740). Building on the perception that men are more overconfident than women, it suggests our seventh hypothesis:

H_7: *Self-employed men are more likely to make more risky or costly decisions than self-employed women.*

4 Data and methodologies

4.1 Data: The Canadian Financial Capability Surveys

This work relies on secondary analysis of data from the 2014 Canadian Financial Capability Survey (CFCS), voluntary surveys conducted by Statistics Canada and sponsored by the Financial Consumer Agency of Canada, Finance Canada, and the Bank of Canada with the objective of examining Canadians' knowledge, abilities and behaviour concerning financial decision-making. The target population comprises all persons 18 years of age and over living in Canada.[3,4]

The 2014 CFCS sampling frame drew on households that had first participated in the Statistics Canada *Labour Force Surveys* of January and February 2014. Data were subsequently collected (May 14, 2014, to June 21, 2014) through computer-assisted telephone interviews of a randomly determined subset of respondents to the *Labour Force Survey*. The 2014 CFCS sample is also a complex sample, with stratification, multiple stages of selection, and unequal probabilities of selection. For these reasons, all analyses employed weightings to ensure that findings represent the wider population (Table 1) [5]. Valid responses were received from 6,685 respondents, a 55.6 percent response rate.

INSERT TABLE 1 ABOUT HERE

[3] Except for territories' residents, full-time members of the Canadian Armed Forces; and the institutionalized population.

[4] This research reflects the independent work of the author and may or may not be consistent with the views of Statistics Canada and the FCAC.

[5] Table 1 summarizes the weighted distributions of demographic attributes drawn from the survey.

4.2 Methodological framework

To test the hypotheses advanced in this research, this study adopts the generic formulation employed by Behrman, Mitchell, Soo, & Bravo (2012), which models financial knowledge (FK) as a function of individual characteristics (C) and educational attainment (S), with a possible interaction between the two variables (arguably, personal characteristics might influence years of education):

$$FK_i = \alpha_0 + \alpha_1 C_i + \alpha_2 S_i + \alpha_3 C_i S_i + \mu_i \quad (1)$$

where μ_i is a random error term. In this study, as in many applications, only a subset of individual characteristics (C*) can be observed, resulting in the extended model:

$$\mathrm{FK_i} = \alpha_0 + \alpha_1 \mathrm{C_i^*} + \alpha_2 \mathrm{S_i} + \alpha_3 \mathrm{C_i^* S_i} + \epsilon_i \quad (2)$$

where ϵ_i represents a compound error term that embeds the original error, μ_I, and the effects of possible unobserved individual characteristics. Conceivably, to the extent that one or more of the missing variables are correlated with both the dependent variable and the error term estimation of (2) potentially involves an omitted variables bias. However, and as noted, this work constitutes a secondary analysis of data, so the usual challenge of identifying suitable instrumental variables is exacerbated This *caveat* should be considered in the interpretation of findings.

4.3 Measures of financial knowledge

For the purpose to test the hypotheses previously established, it is necessary to create scales to measure factors such as financial knowledge, both objectively assessed and subjectively assessed.

Objectively assessed financial knowledge (OFK). Objective measurement of financial knowledge (OFK) was based on responses to a set of 14 multiple choice and true/false quiz-like questions about common financial topics. This approach is used throughout the literature on financial literacy. Among the questions, financial themes included inflation, interest rates, stocks,

bonds, loans and debt (see Table 2). Questions 3, 10 and 14 are not included in this research, either because the vast majority of respondents answered them incorrectly, or (in the authors' view) the questions were phrased in a somewhat confusing manner. After considering these exclusions, the sum of correct answers was used to determine how respondents were classified in their objective financial knowledge. Then, respondents were divided into 3 categories: "low", "medium" and "high" OFK. The low OFK includes the 1,353 respondents who answered 0 to 6 out of 11 questions correctly; the Medium OFK grouping comprised the 1,297 respondents who answered 7 or 8 out of 11 questions correctly; the High OFK grouping comprised the 1,629 respondents who answered 9 to 11 of 11 questions correctly. Afterwards, these 3 categories were divided by gender (Table 3) and by self-employed individuals divided by gender (Table 4). Table 3 (Pearson Chi-Square = 22.38 and p-value = 0.000) and table 4 (Pearson Chi-Square = 20.43 and p-value = 0.000) show that there is relationship between gender and financial knowledge.

INSERT TABLE 2, 3 AND 4 ABOUT HERE

Subjectively assessed financial knowledge (SFK). The CFCS survey also posed a series of questions that asked respondents to self-assess their financial knowledge, asking, "How would you rate your level of financial knowledge?" with a scale of "Very Knowledgeable" (=1), "Knowledgeable" (=2), "Fairly Knowledgeable" (=3), or "Not Very knowledgeable" (=4). The categorical responses to this question are employed to represent self-assessed financial knowledge (SFK). The distribution of this response is shown by gender in Table 5 and by self-employed individuals divided by gender in Table 6. Table 5 (Pearson Chi-Square = 79.71 and p-value = 0.000) and table 6 (Pearson Chi-Square = 26.37 and p-value = 0.000) show that there is relationship between gender and financial confidence.

INSERT TABLE 5 AND 6 ABOUT HERE

4.4 Measures of financial confidence groupings

Because OFK scores did not differ between respondents who rated themselves as "Knowledgeable" and "Fairly Knowledgeable", SFK measures were reduced from 4 categories to 3: Very Knowledgeable became High SFK; Knowledgeable and Fairly Knowledgeable became Medium SFK; and Not Very Knowledgeable became Low SFK. The juxtaposition of these two measures, self-assessed (SFK) a and objectively assessed (OFK) allows for the identification of over- and underconfident respondents. Each of these groups reflects varying levels of confidence: overconfident (=1), appropriately confident (=2), and underconfident (=3) (Table 7). These groupings were later further partitioned by gender (Table 8), and by employment status and gender (Table 9). Table 8 (Pearson Chi-Square = 2.46 and p-value = 0.290) and table 9 (Pearson Chi-Square = 2.82 and p-value = 0.240) indicate that there is not enough evidence to suggest an association between gender and confidence groupings.

INSERT TABLES 7, 8 AND 9 ABOUT HERE

4.5 Measure for using "alternative financial services" (AFS) assessment

The survey also posed 3 questions regarding the use of alternative financial services (see Table 10). A measure for using AFS was established adopting the following criteria: if any of the three questions in Table 10 was answered affirmatively, it was considered a bad financial decision. For AFS1, "A pawnbroker to sell a possession?", 92 respondents confirmed; for AFS2, "A payday loan service?", 129 respondents affirmed; and for AFS3, "A cheque cashing service, other than a bank?", 87 respondents confirmed. As might be expected, there were some overlaps among the respondents that used the various forms of AFS, therefore, after excluding such double counting, there were 179 individuals who used one or more forms of AFS out of 3,790 respondents.

INSERT TABLE 10 ABOUT HERE

4.6 Methodological approach

This research relied on the estimation of multivariate analyses to empirically test the hypotheses. The financial knowledge differences by occupational role (H1); by gender when self-employed (H2); and by gender when comparing self-employed vs employee (H3) were examined using estimation of ordinary least squares models in which the dependent variable was the number of correct answers to the 11-question financial "quiz" that was part of the questionnaire. Hypotheses four and five, financial confidence, were examined by estimating ordered probit models of financial confidence. Hypothesis six, confidence level, was examined by estimating an ordered probit model of financial confidence, and the three confidence categories. The final hypothesis, which relates to the likelihood of using AFS, was examined by estimating a logistic regression model of AFS in which the dependent variable was equal to one if the respondent had use AFS and zero otherwise.

Control variables comprised categorical variables corresponding to variables that the research literature had identified as antecedents of financial knowledge: respondents' age (5 categories), education (5 categories), language (3 categories), a binary variable according to whether (=1) the respondent was an immigrant; whether (=1) the respondent was aboriginal; whether (=1) the respondent had previously taken courses in finance; and whether (=1) the respondent was married.

5 Empirical findings

5.1 Financial knowledge, self-employment and gender

The results of the OLS estimation model of financial knowledge are shown in Table 11. In all cases, the models were statistically significant at p-values<0.01 and R-squared values were reasonable for cross-sectioned data. Based on 4,177 observations (3,650 employees and 527 self-employed individuals), Model 1 estimates parameters associated with control variables, showing that age, education language, immigrant status and having taken a course in finance or economics are all significantly related to the financial knowledge measure. This confirms previous findings (Xu & Zia, 2012). It also confirms that women do not, on average, score as highly as men on financial knowledge (p-value<0.05). Model 1 was then augmented (Model 2) by the addition of a binary variable connoting occupational status; however, this variable was not statistically significant, an initial indication that self-employed individuals—contrary to H1—are not more financially knowledgeable than employees.

INSERT TABLE 11 ABOUT HERE

To further examine the extent to which the data support or refute the hypotheses, Model 3 is based only on self-employed respondents. In Model 3, the binary gender variable is not statistically significant, failing to supportH2. Moreover, in Model 3, post-estimation testing of the difference in the financial knowledge gender gaps among employees and among self-employed individuals was also carried out, resulting in a p-value for the gender gap difference of 0.128, suggestive, but hardly definitive. This result does not support H3.

5.2 Financial confidence, self-employment and gender

The fourth hypothesis was that self-employed women would, on average, have lower financial confidence than men counterparts. The financial confidence's scale ranged from "Very knowledgeable" = 1 to "Not very knowledgeable" = 4. On a bivariate basis for the whole sample

of 3,608 respondents, gender and SFK are not independent ($X^2 = 79.71$; p-value=0.000) (Table 5). Similarly, when testing on 503 observations of self-employed respondents, gender and SFK are not independent ($X^2 = 26.37$; p-value=0.000) (Table 6).

To control for other potentially confounding factors, ordered probit regression models of financial confidence (SFK) were estimated (Table 12). The initial model shows that individuals who are older, speak French as a first language and have taken a course in finance are all significantly more confident. Model 1 included a binary variable corresponding to the gender of the respondent. In the second model, in addition to age and having taken a course in finance, higher education and being married are also significant correlates of financial confidence.

INSERT TABLE 12 ABOUT HERE

Model 1 shows that self-employed women scored significantly higher ($p<0.05$) than self-employed men, meaning that self-employed women have less financial confidence than self-employed men. This result supports H4.

Model 2 shows the results of conditioning the occupational status variable on gender. The result shows that there is no significant difference between self-employed men and employed men. Post-estimation test of the difference between coefficients estimated for self-employed women and employed women, yielded a p-value of 0.167, also not significant. This result supports H5.

5.3 Confidence grouping, self-employment and gender

The sixth hypothesis was that self-employed women are less likely to be overconfident than self-employed men. The juxtaposition of OFK with SFK's scales enables the establishment of confidence groupings: overconfident (=1), appropriately confident (=2), and underconfident (3). Model 1 shows that individuals who are older tend to be less likely to be overconfident, having a

higher education presented the same result, yet individuals that speak French as a first language tend to be significantly more likely to be overconfident.

To control for potential confounding factors, an ordered probit regression model of confidence groupings was estimated (Table 13). Working only with self-employed individuals and based on 499 observations, Model 1 shows that higher education and language are significantly related to overconfidence as quantified by the number of correct answers to the financial questionnaire and the self-assessment. In addition, Model 1 shows that self-employed women scored higher than self-employed men, meaning that self-employed women are significantly (p-value<0.01) less likely to be overconfident that self-employed men, supporting H6.

INSERT TABLE 13 ABOUT HERE

5.4 Using alternative financial services, self-employment and gender

For the purpose of establishing the use of AFS, a logistic regression model was estimated in which the binary dependent variable was whether or not the respondent had answered affirmatively to any one of the questions: "how many times did you or another member of your family use the following alternative financial services:" (0 = never; 1 = one or more times). Based on 4,279 observations, self-employed men had a score of 5.6 and self-employed women had a score of 6.3 This difference is not statistically significant.

In order to identify antecedents of the use of AFS, a logistic regression model was estimated. Model 1 (Table 14) presents that control variables education, language, and being an immigrant, aboriginal or married were statistically significant correlates of using AFS. Moreover, model 1 shows the results of conditioning the occupational status variable on gender. The result shows that there is a significant difference between self-employed men and employed men; however, when comparing self-employed men against self-employed women there is no

significant difference meaning that both genders are equally likely to use AFS, therefore rejecting hypothesis 7.

INSERT TABLE 14 ABOUT HERE

6 Review of findings

INSERT TABLE 15 ABOUT HERE

6.1 Financial knowledge, self-employment and gender (H1, H2, and H3)

The first hypothesis states that, on average, self-employed individuals have higher objective financial knowledge than employees. Empirical findings were not consistent with H1.

Confirming previous research, the data showed that women scored lower on OFK than men; however, when controlled by self-employment, this gap was not statistically significant, therefore rejecting H2. Moreover, model 3 reports on the extent to which the gender gap in financial knowledge among employees differed from that among self-employed people. The difference was not statistically significant, refuting H3.

6.2 Financial confidence, self-employment and gender (H4 and H5)

In accordance with the literature, self-employed women had lower self-efficacy when compared to men counterparts, consequently supporting H4. On the other hand, the involvement in financial management on a daily basis does not increase financial self-efficacy of self-employed women and the difference towards employee women was not significant, supportingH5.

6.3 Confidence grouping, self-employment and gender (H6)

Self-employed women being less likely to be overconfident than self-employed men was the sixth hypothesis. After the creation of confidence groupings and its scale, the results show that indeed self-employed women were significantly less overconfident than self-employed men. Consequently, H6 was supported by the data.

6.4 Using alternative financial services, self-employment and gender (H7)

Hypothesis 7 posited that self-employed men would make more use of AFS than self-employed women. The data shows that while the difference between self-employed men and employed men was significant, self-employed men and self-employed women had no significant difference, therefore rejecting H7.

7 Conclusions

7.1 Implications of findings

An important finding of this study is that self-employed persons do not have more financial knowledge than employees. This finding can be seen as counterintuitive, especially as one would expect that self-employed individuals would, at least, seem more knowledgeable simply because of survival bias, meaning that if they were the ones that still operating and have not filed for bankruptcy, among other reasons such as poor financial management, they should have a higher financial knowledge. On the other hand, this result may explain the low survival rate of 63% of small and medium companies after 5 years (Archambault & Song, 2018).

In accordance with previous research, women, in general, were found to score lower than men on financial knowledge. When conditioned on occupational status, the difference between self-employed men and self-employed women was not significant. This implies that when women become self-employed or become more involved with financial matters on a daily basis, the gender gap in financial knowledge is reduced. This is also a finding that suggests the need to increase financial education for women, particularly among employees.

Consistent with the literature, women presented with lower financial confidence than men, even when conditioned on occupational status, the difference was significant. However, financial confidence did not differ between employee women and self-employed women. Dealing with financial topics with regularity and supposedly increasing the objective financial knowledge among self-employed women, does not increase their financial self-efficacy. This finding corroborates with role congruity theory where even when a woman rises to a position of leadership, as a self-employed person, the look of congruence of the role (financial decision maker) with her gender, restrains her from increasing its level of financial confidence.

Moreover, the finding about overconfidence also was congruent with previous research. Self-employed men were found to be more likely to be overconfident than self-employed women. Likewise, it was expected that because self-employed men were more overconfident than self-employed women, self-employed men would make more risky decisions than self-employed women and be more likely to use alternative financial services. However, there was no significant difference in the use of AFS between self-employed men and self-employed women. One inference on this can be that self-employed men's overconfidence was offset by self-employed women's lack of confidence. Given that Parker, Bruin, Yoong, & Willis (2012) propose that confidence induces better, and not worse, financial decisions. Asaad (2015) and Goel & Thakor, (2008) agree that confidence is productive up to a certain point, but then it can become detrimental, not having enough confidence may lead self-employed women to poor financial decisions or, at least, prevent good ones. Future research could resolve these potential explanations.

When analyzing the hypotheses under the RCT framework, just 3 out of 5 hypotheses were supported by the empirical findings (H1 and H3 were not gender-related). Therefore, findings were inconclusive concerning whether this study supports or rejects RCT. Due to the fact that RCT is based on prescriptive and descriptive gender stereotypes, in circumstances where gender stereotypes are not in place, financial behaviour cannot be explained by RCT. Another limitation of RCT's ability to suggest financial behaviour presents itself when the decision maker has little to none influence to gender stereotype. Presumably, there could be other theories, that interacting with RCT, can help to better explain how people make financial decisions such as social cognitive theory (which describes human behaviour as a triadic reciprocal relationship among three factors: personal, behaviour, and environment (Bandura, 1986)). However, these interactions were not a subject of this study.

Making good financial decisions is not only about financial knowledge. Obviously, to be able to make sound financial decisions, one would need the skills to gather, read, and interpret financial data, however, financial confidence and other factors, such as personal characteristics, also influence financial behaviour. One crucial finding is that although financial confidence is an important and desirable trait, too much of it may become detrimental if not balanced by the same level of knowledge, i.e., becoming overconfident. Consequently, educators need to develop unique approaches to lecture financial programs to someone who believes that they do not need it. Ultimately, this study has two important conclusions: (i) educators and policymakers should recognize that financial knowledge and financial confidence are both inferential with respect to financial literacy; and (ii) women need specific educational programs not only to expand their financial knowledge but also to provide them with the proper tools to boost their self-efficacy.

7.2 Limitations

This research has some important limitations. First, this study is based on secondary analysis of data limiting by the scope of the research. Further research could benefit from questions regarding the number of years as self-employed, number of employees, and industry classification etc. Second, only one question about self-assessment was used in the current analyses, in the future, a more elaborate survey would grant a more precise assessment.

Another relevant point is the use of alternative financial services. Due to the fact that the survey asked questions regarding financial decisions on a personal level, it was assumed that individuals would have the same behaviour when dealing with financial decisions on a corporate level. Also, the survey asked about the use of AFS, but has not asked the reason why someone made use of it.

7.3 Future research

These findings and limitations present a suggestion for future research in the financial literacy field:

- *International data*: The data used in this study were based on Canadian respondents. Expanding the geographic reach of the data would be interesting.
- *Dedicated survey*: A survey focused on the SME's needs could bring more incisive interpretation.

8 Tables

Table 1: Demographic attributes of 2014 CFCS samples

Variable	Frequency	Weighted Frequency	Percent of total
Age			
18 to 24	359	3,263,425	11.8
25 to 34	840	4,842,145	17.5
35 to 44	994	4,609,991	16.6
45 to 54	1,228	5,198,110	18.8
55 to 59	660	2,311,763	8.3
60 to 64	668	2,282,718	8.2
60 to 69	639	1,793,151	6.5
more than 70	1,297	3,421,924	12.3
Gender			
Male	3,075	13,649,348	49.2
Female	3,610	14,073,879	50.8
Marital status			
Married	3,137	13,631,802	49.2
Common-law	587	3,219,945	11.6
Widowed	675	1,309,091	4.7
Separated	267	802,638	2.9
Divorced	630	1,695,809	6.1
Never married etc.	1,366	6,936,356	25
Don't know, etc.	1	127,586	0.4
Highest education			
High school of less	2,372	9,559,299	34.5
Some college, no degree	421	2,396,564	8.6
College/vocational school	2,176	8,491,762	30.6
Undergraduate degree	1,177	5,013,493	18.1
Graduate degree	456	1,984,510	7.2
Employment Status			
Employed	3,258	14,766,064	53.3
Self-employed	532	2,374,749	8.6
Not working, looking	201	1,208,047	4.4
Not working, not looking	357	1,698,184	6.1
Retired	2,079	5,822,628	21
Student	137	1,316,306	4.7
Household, unpaid	108	476,037	1.7
Don't know, etc.	1	1,600	0.3
Total	6,685	27,723,227	100

Table 2: Objective financial questions

OFK1 - If the inflation rate is 5% and the interest rate you get on your savings is 3%, will your savings have at least as much buying power in a year's time? 1 Yes 2 No*
OFK2 - A credit report is…? 1 A list of your financial assets and liabilities 2 A monthly credit card statement 3 A loan and bill payment history* 4 A credit line with a financial institution
OFK3 - Who insures stocks in the stock market? 1 The National Deposit Insurance Corporation 2 The Securities and Exchange Commission 3 The Bank of Canada 4 No one*
OFK4 - True or false. By using unit pricing at the grocery store, you can easily compare the cost of any brand and any package size. 1 True* 2 False
OFK5 - If each of the following persons had the same amount of take home pay, who would need the greatest amount of life insurance? 1 A young single woman with two young children* 2 A young single woman without children 3 An elderly retired man, with a wife who is also retired 4 A young married man without children
OFK6 - 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? 1 Sales tax may be charged on the interest that you earn 2 You cannot earn interest until you pass your 18th birthday 3 Earnings from savings account interest may not be taxed 4 Income tax may be charged on the interest if your income is high enough*
OFK7 - Inflation can cause difficulty in many ways. Which group would have the greatest problem during periods of high inflation that lasts several years? 1 Young working couples with no children 2 Young working couples with children

3 Older, working couples saving for retirement
4 Older people living on fixed retirement income*

OFK8 - Lindsay has saved $12,000 for her university expenses by working part-time. Her plan is to start university next year and she needs all of the money she saved. Which of the following is the safest place for her university money?
1 Corporate bonds
2 Mutual Funds
3 A bank savings account*
4 Locked in a safe at home
5 Stocks

OFK9 - Which of the following types of investment would best protect the purchasing power of a family's savings in the event of a sudden increase in inflation?
1 A twenty-five-year corporate bond
2 A house financed with a fixed-rate mortgage*
3 A 10-year bond issued by a corporation
4 A certificate of deposit at a bank

OFK10 - Under which of the following circumstances would it be financially beneficial to borrow money to buy something now and repay it with future income?
1 When something goes on sale
2 When the interest on the loan is greater than the interest obtained from a savings account
3 When buying something on credit allows someone to get a much better paying job*
4 It is always more beneficial to borrow money to buy something now and repay it with future income

OFK11 - Which of the following statements is not correct about most ATM (Automated Teller Machine) cards?
1 You can get cash anywhere in the world with no fee*
2 You must have a bank account to have an ATM card
3 You can generally get cash 24 hours-a-day
4 You can generally obtain information concerning your bank balance at an ATM machine.

OFK12 - Which of the following can hurt your credit rating?
1 Making late payments on loans and debts*
2 Staying in one job too long
3 Living in the same location too long
4 Using your credit card frequently for purchases

OFK13 - What can affect the amount of interest that you would pay on a loan?
1 Your credit rating

2 How much you borrow
3 How long you take to repay the loan
4 All of the above*

OFK14 - Which of the following will help lower the cost of a house?
1 Paying off the mortgage over a long period of time
2 Agreeing to pay the current rate of interest on the mortgage for as many years as possible
3 Making a larger down payment at the time of purchase*
4 Making a smaller down payment at the time of purchase

* - Correct answer.

Table 3: Objective financial knowledge tertile by gender – All respondents

ALL	Male	Female	Total
Lowest tertile	N=540 OFK=3.65	N=625 OFK=3.76	N=1,165
Middle tertile	N=570 OFK=7.55	N=586 OFK=7.51	N=1,156
Highest tertile	N=813 OFK=9.77	N=656 OFK=9.69	N=1,469
Total	N=1923	N=1867	N=3,790
Pearson Chi-Square	22.38		
p-value	0.000		

N = number of cases; OFK = mean objective financial knowledge score

Table 4: Objective financial knowledge tertile by gender – Self-employed

Self-employed	Male	Female	Total
Lowest tertile	N=95 OFK=2.93	N=62 OFK=3.50	N=157
Middle tertile	N=82 OFK=7.52	N=52 OFK=7.48	N=134
Highest tertile	N=145 OFK=9.82	N=96 OFK=9.71	N=241
Total	N=322	N=210	N=532
Pearson Chi-Square	20.43		
p-value	0.000		

N = number of cases; OFK = mean objective financial knowledge score

Table 5: Self-assessed financial knowledge tertile by gender – All respondents

All Respondents	Male	Female	Total
Very knowledgeable = 1	174	102	276
(%)	63.0%	37.0%	100.0%
Knowledgeable = 2	657	448	1,105
(%)	59.5%	40.5%	100.0%
Somewhat knowledgeable = 3	746	830	1,576
(%)	47.3%	52.7%	100.0%
Not very knowledgeable = 4	270	381	651
(%)	41.5%	58.5%	100.0%
Total	1,847	1761	3,608
(%)	51.2%	48.8%	100.0%
Pearson Chi-Square	79.71		
p-value	0.000		

Table 6: Self-assessed financial knowledge tertile by gender – Self-employed

Self-Employed	Male	Female	Total
Very knowledgeable = 1	43	12	55
(%)	78.2%	21.8%	100.0%
Knowledgeable = 2	129	53	182
(%)	70.9%	29.1%	100.0%
Somewhat knowledgeable = 3	98	99	197
(%)	49.7%	50.3%	100.0%
Not very knowledgeable = 4	37	32	69
(%)	53.6%	46.4%	100.0%
Total	307	196	503
(%)	61.0%	39.0%	100.0%
Pearson Chi-Square	26.37		
p-value	0.000		

Table 7: Financial confidence groupings

	Low OFK	Medium OFK	High OFK
Low SFK	Appropriately confident N=248	Under-confident N=208	Under-confident N=196
Medium SFK	Overconfident N=677	Appropriately confident N=876	Under-confident N=1128
High SFK	Overconfident N=63	Overconfident N=71	Appropriately confident N=142

Table 8: Financial confidence groupings by gender

All respondents	Male	Female	Total
Under-confident	805	726	1,531
Accurate confidence	628	638	1,266
Overconfident	414	397	811
Total	1,847	1,761	3,608
Pearson Chi-Square	2.46		
p-value	0.290		

Table 9: Financial confidence groupings – Self-employed by gender

Self-employed	Male	Female	Total
Under-confident	129	097	226
Accurate confidence	104	060	164
Overconfident	074	039	113
Total	307	196	503
Pearson Chi-Square	2.82		
p-value	0.240		

Table 10: Alternative financial services questions

In the last 12 months, how many times did you or another member of your family use the following alternative financial services:			
AFS1 - A pawnbroker to sell a possession?	**Freq.**	**Percent**	**Cum.**
Never	3,631	97.53%	97.53%
One time	30	0.81%	98.33%
Twice	56	1.50%	99.84%
Three times or more	6	0.16%	100.00%
Total	3,723	100.00%	
AFS2 - A payday loan service?	**Freq.**	**Percent**	**Cum.**
Never	3,590	96.53%	96.53%
One time	31	0.83%	97.36%
Twice	72	1.94%	99.30%
Three times or more	26	0.70%	100.00%
Total	3,719	100.00%	
AFS3 - A cheque cashing service, other than a bank?	**Freq.**	**Percent**	**Cum.**
Never	3,638	97.66%	97.66%
One time	19	0.51%	98.17%
Twice	60	1.61%	99.79%
Three times or more	8	0.21%	100.00%
Total	3,725	100.00%	

Table 11: Ordinary least square models of objective financial knowledge

	Model			
Variables	(1)	(2)	(3)	(4)
Age category (base is <35)				
35-44	0.433**	0.423**	0.722	0.425**
	(0.192)	(0.193)	(0.660)	(0.193)
45-54	0.297	0.271	0.670	0.281
	(0.200)	(0.197)	(0.681)	(0.196)
55-64	0.394*	0.371*	1.373*	0.370*
	(0.203)	(0.205)	(0.719)	(0.205)
65+	-0.135	-0.175	0.604	-0.163
	(0.325)	(0.329)	(0.748)	(0.331)
Education category (base=high school or less)				
Some college, university	1.041***	1.038***	0.891	1.033***
	(0.275)	(0.276)	(1.054)	(0.277)
College, trade, vocational	0.888***	0.891***	0.883	0.898***
	(0.191)	(0.191)	(0.543)	(0.191)
University undergraduate	1.871***	1.864***	2.552***	1.858***
	(0.207)	(0.209)	(0.620)	(0.207)
University graduate degree	1.793***	1.781***	2.698***	1.783***
	(0.259)	(0.260)	(0.756)	(0.259)
Language				
French	-0.627***	-0.627***	-1.087**	-0.627***
	(0.148)	(0.148)	(0.474)	(0.148)
Other	-1.546***	-1.542***	-2.035**	-1.534***
	(0.276)	(0.277)	(0.839)	(0.276)
Immigrant	-1.226***	-1.234***	-1.143*	-1.230***
	(0.286)	(0.285)	(0.645)	(0.285)
Aboriginal	-0.228	-0.232	0.890	-0.243
	(0.286)	(0.285)	(0.660)	(0.284)
Had taken course in finance	0.578***	0.575***	0.389	0.576***
	(0.208)	(0.208)	(0.576)	(0.208)
Married	0.497***	0.484***	0.379	0.477***
	(0.142)	(0.141)	(0.380)	(0.141)
Women	-0.322**	-0.311**	0.158	
	(0.138)	(0.137)	(0.355)	
Self-employed		-0.214		
		(0.231)		
Employed men				0.037
				(0.311)

Employed women				-0.349
				(0.316)
Self-employed men				0.000
				(0.000)
Self-employed women				0.265
				(0.406)
Constant	6.327***	6.534***	5.866***	6.318***
	(0.217)	(0.320)	(0.831)	(0.372)
Observations	4,177	4,177	527	4,177
R-squared	0.172	0.172	0.247	0.174
Robust standard errors in parentheses	*** p<0.01, ** p<0.05, * p<0.1			

Table 12: Ordered probit models of subjective financial knowledge

	Model	
Variables	(1)	(2)
Age category (base is <35)		
35-44	-0.183	-0.205**
	(0.248)	(0.092)
45-54	-0.546***	-0.284***
	(0.178)	(0.081)
55-64	-0.332*	-0.210**
	(0.190)	(0.089)
65+	-0.509*	-0.547***
	(0.285)	(0.122)
Education category (base=high school or less)		
Some college, university	-0.317	0.164
	(0.364)	(0.128)
College, trade, vocational	0.285*	-0.032
	(0.166)	(0.075)
University undergraduate	-0.303	-0.269***
	(0.186)	(0.080)
University graduate degree	0.143	-0.342***
	(0.282)	(0.122)
Language		
French	-0.408***	-0.049
	(0.155)	(0.069)
Other	0.211	0.238*
	(0.320)	(0.121)
Immigrant	-0.288	-0.029
	(0.274)	(0.121)
Aboriginal	-0.429	0.059
	(0.331)	(0.113)
Had taken course in finance	-0.598*	-0.636***
	(0.318)	(0.094)
Married	-0.287	-0.230***
	(0.221)	(0.069)
Women	0.361**	
	(0.141)	
Employed men		0.184
		(0.127)
Employed women		0.437***
		(0.127)

Self-employed men		0.000
		(0.000)
Self-employed women		0.293*
		(0.151)
Constant cut3	0.748***	0.740***
	(0.283)	(0.150)
Constant cut1	-1.961***	-1.759***
	(0.271)	(0.149)
Constant cut2	-0.748***	-0.531***
	(0.260)	(0.147)
Observations	499	3,980
p	3.06e-05	0
chi2	47.50	136.8

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 13: Ordered probit models of confidence groupings

Variables	Model (1)
Age category (base is <35)	
35-44	0.417
	(0.304)
45-54	0.280
	(0.273)
55-64	0.536**
	(0.273)
65+	0.067
	(0.312)
Education category (base=high school or less)	
Some college, university	-0.032
	(0.362)
College, trade, vocational	0.176
	(0.198)
University undergraduate	0.474**
	(0.215)
University graduate degree	0.873***
	(0.249)
Language	
French	-0.734***
	(0.195)
Other	-1.004***
	(0.222)
Immigrant	0.021
	(0.191)
Aboriginal	-0.493
	(0.562)
Had taken courses in finance	-0.073
	(0.175)
Married	0.109
	(0.200)
Women	0.398***
	(0.152)
Constant cut1	-0.533
	(0.348)
Constant cut2	0.605*
	(0.343)

Observations	499
p	1.38e-06
chi2	55.67

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 14: Logistic models of alternative financial services

Variables	Model (1)
Age category (base is <35)	
35-44	-0.043
	(0.181)
45-54	-0.099
	(0.173)
55-64	-0.591***
	(0.209)
65+	0.076
	(0.236)
Education category (base=high school or less)	
Some college, university	-0.541*
	(0.277)
College, trade, vocational	-0.169
	(0.144)
University undergraduate	-0.806***
	(0.204)
University graduate degree	-0.676**
	(0.272)
Language	
French	0.676***
	(0.144)
Other	0.619***
	(0.238)
Immigrant	0.400*
	(0.235)
Aboriginal	0.675***
	(0.258)
Had taken course in finance	0.106
	(0.202)
Married	-0.346***
	(0.125)
Employed men	0.809**
	(0.325)
Employed women	0.719**
	(0.327)
Self-employed men	0.000
	(0.000)

Self-employed women	0.454
	(0.439)
Constant	-3.022***
	(0.368)
Observations	4,177
p	0
chi2	84.98

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 15: Summary of findings

Hypothesis	Topics	Empirical finding
Hypothesis 1: Financial knowledge differs by occupational role such that, on average, the financial knowledge of self-employed individuals exceeds that of employees.	Financial knowledge and self-employment.	Not supported (see table 11).
Hypothesis 2: Self-employed men have, on average, higher financial knowledge than self-employed women.	Financial knowledge, self-employment and gender.	Not supported (see tables 4 & 11).
Hypothesis 3: The gender gap, if any, in financial knowledge among self-employed individuals is smaller than that among the benchmark category consisting of male and female employees.	Financial knowledge, self-employment and gender.	Not supported (see tables 3, 4 & 11).
Hypothesis 4: Even though they might be involved in financial management on a daily basis, self-employed women have, on average, lower financial self-efficacy than men counterparts.	Financial confidence, self-employment and gender	Supported (see tables 6 & 12).
Hypothesis 5: However, for the same reason, self-employed women have, on average, higher financial self-efficacy than employed women.	Financial confidence, self-employment and gender	Not supported (see tables 5, 6 & 12).
Hypothesis 6: Given that women tend to be more risk averse than men, self-employed women are less likely to be overconfident than self-employed men.	Confidence grouping, self-employment and gender	Supported (see tables 7, 9 and 13).
Hypothesis 7: Self-employed men are more likely to make more risky or costly decisions than self-employed women.	Alternative financial services, self-employment and gender	Not supported (see tables 10 & 14).

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