IMPACT OF FINANCIAL SELF-EFFICACY AND
FINANCIAL LITERACY ON SMALL-BUSINESS
DECISION MAKING BEHAVIORS AND
PERFORMANCE PERCEPTION

By

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When I first started working on this dissertation, I did not realize how nerve racking and time consuming it would be. I experienced multiple challenges with the project, including delays of data collection due to pandemic outbreak; working with an organization hit hard by legal changes put into place in response to the pandemic; and a general personal battle with the dissertation writing process. It took every ounce of willpower I had to overcome staring at the blinking cursor on a blank page and forcing myself to put something down. Fortunately, I had the help of numerous people that tried to prevent me from becoming too overwhelmed with the dissertation process.

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Title of Study: IMPACT OF FINANCIAL SELF-EFFICACY ANDFINANCIAL LITERACY ON SMALL-BUSINESS DECISION MAKING BEHAVIORS AND PERFORMANCE PERCEPTION

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Abstract: Small businesses have an extremely large global economy impact, they are significant actors on the world economy, they are responsible for a substantial portion of the gross domestic product, and they employ a large share of the populace in many developing and developed countries. Many small business owners tend to have little knowledge regarding accounting information, and they generally rely on familiar valuations or heuristics as indicators of performance. The topic of financial information use in small businesses decision making rarely makes use of financial literacy research or theoretically ground their work by making use of established psychometric variables such as self-efficacy. In this study, a survey was disseminated to the regional branches of the U.S. Small Business Administration, Small Business Development Center, local small business owners, and small to medium sized local CPA firm. A significant correlational relationship between the level of financial self-efficacy, financial literacy, procurement of financial services, financial information use, and perceived financial performance was found. Two different software packages were used in this examination and theory-based model testing. When bootstrapped linear regressions of financial literacy and financial self-efficacy onto the three dependent variables were performed, the coefficients for the proposed mediations were not significant.
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CHAPTER I

INTRODUCTION

Many small business owners tend to have little knowledge regarding accounting information, and they generally rely on familiar valuations (such as the amount of cash in their business bank account) as an indicator of performance (Halabi, Barrett, & Dyt, 2010). Due to their size and lack of in-house experts and resources, small businesses are predisposed to require external finance resources and financial experts (Bennett & Robson, 2005). Small entrepreneurial businesses, with limited internal access to financially literate decision makers, are forced to rely on heuristics for the day-to-day operations and consult outsiders only in special cases. In most cases, small business managers rely on the outside expertise of accountants for statutory/regulatory services, like those found in specialized areas like taxation (Halabi et al., 2010). Many small business managers are left befuddled by the information processed and provided by these specialists (Sian, 2009), thus it not surprising that small businesses are hesitant to procure more detailed financial knowledge from these same external sources. To make matters worse, it has been shown that individuals that are less confident in their own financial abilities are less likely or able to procure these kinds of formal financial services (Rachel & Musa, 2017). Thus, financial self-efficacy (the belief or confidence in one’s own capabilities to perform financial related tasks in a manner that results in desired outcomes) plays a major role in in the decision to seek additional financial information and services.
Financial self-efficacy (FSE) is a relatively new area of study, but it may prove a valuable explanatory variable in business research and will be discussed in more depth in the Literature Review section. Based on my exploration of the existing research, the topic of financial information use in small businesses decision making rarely makes use of financial literacy research, even though the use of accounting information relies on the financial literacy of the information user. As a result, small business’ financial information use studies are often more qualitative in nature or provide only simple statistical findings based on demographic variables such as education level and gender. Rarely do these studies try to explain the underlying behaviors or theoretically ground their work by making use of established psychometric variables such as self-efficacy. Thus, the use of financial self-efficacy (FSE) and financial literacy (FL) in the small business context are both still in their infancy. It is for this reason, I want the current study to analyze the financial literacy, perceptions, and efficacy of small-to-medium sized business decision makers. Specifically, I want to answer the question: What is the relationship between financial literacy, financial information seeking behavior, and financial self-efficacy (FSE) of small business decision makers?

The benefits of and need for financial literacy have been well explored in the consumer arena, and similarly themed studies are sparse in the arena of small businesses. Rather, similarly themed small-business literature focuses on the use (or lack of information procurement) of financial information for decision making. The current research recognizes that there are likely many explanations for why small businesses may (or may not) acquire additional financial information (Andersén & Samuelsson, 2016; Bennett & Robson, 2005; Carey, 2016; Marriott & Marriott, 2000). One group of researchers believe the reason that additional external financial information is not being requested, is because of the lack of “financial awareness of the owner managers” (Marriott & Marriott, 2000). Other researchers have started looking at the relationship between training, building the necessary knowledge, increasing financial self-efficacy, and the resulting impact on financial outcomes (Kirsten, 2018; Rothwell, Khan, & Cherney, 2016).
It is well established that most small business owners/managers do use some form of accounting records created internally (usually with the aid of computerized accounting packages), but many managers rely on the outside expertise of practicing accountants for financial, budgetary, forecasting, and statutory/regulatory services (Holmes & Nicholls, 1989; Sian, 2009). Even though many small businesses do procure some external financial services, these qualitative studies have shown that many managers rarely procure additional financial information beyond those that are necessary for statutory or regulatory requirements. The often cited culprits for this lack of voluntary financial information procurement is the perceived excessive cost and alleged uselessness of the additional information that could be made available from these financial specialists (Halabi et al., 2010; Marriott & Marriott, 2000). These perceptions are in direct conflict with previous research that discusses the importance of timely financial information and found that small businesses often don’t invest a sufficient portion of their limited resources to maintain adequate records (Babani & Sharma, 2015).

How can accounting be granted the lofty title of the “language of business” by many, while others don’t find the financial information that accounting creates to be important to their business decisions or necessary to facilitate potential success?

This is an interesting question, especially considering the possible benefits of having useful financial information during the decision-making process. Specifically, more informed decisions lead to better decisions and it has been shown that the profitability of both growing and nongrowing small businesses are positively affected by the use of certain accounting information (Andersén & Samuelsson, 2016). A possible explanation for this disagreement about the importance of financial information in small business may be due to entrepreneurs’ differing characteristics. Entrepreneurs and small business managers enter their positions with different backgrounds (such as education, training, experience, etc.), abilities/specialties, and are likely to be adept at performing some tasks more than others (i.e. it is impossible for anyone to know, or be good at, everything), but successful entrepreneurs generally have education or training in their target industry (Amatucci & Crawley,
If using financial information is so beneficial, why are these entrepreneurs not procuring the training or knowledge necessary to use financial information even though it may be outside of their target industry? I theorize that it is a lack in these decision-maker’s financial self-efficacy that helps explain the bias against improving their financial literacy, which in turn results in numerous negative outcomes.

Financial literacy endures as a subject of debate, with a great deal of attention and discussion transpiring on the topic. The news media reports on it, financial educators are tasked to increase it in their students, and business professionals are affected by the lack of it in many of their day-to-day interactions. Financial scandals, market downturns, and regulatory changes have only increased the scrutiny on the financial markets – thus the effect financial literacy has on firm performance needs to be investigated more fully. The ever-increasing complexity of, and accessibility to, financial services and products should require a corresponding increase in knowledge of the users/consumers of these services and products. Unfortunately it appears that this is not the case, and many studies have shown widespread financial illiteracy in many populations (JSC, 2008; Lusardi & Mitchell, 2007, 2014; Mandell & Klein, 2007). The literature that exists measures, reports, and compares financial literacy across multiple demographics. Certain demographics have received more attention than others, such as high school students and individuals of retirement age. In these previous financial literacy studies, the human capital costs and benefits were examined on a personal financial level, but relatively little attention has been placed on financial literacy’s impact on small business.

Academically, understanding the related causes and effects of financial literacy on small business performance is relatively unexplored and theory needs to be generated to explain small business decision makers’ perceptions of financial literacy. This study will attempt to do this by framing it as part of the larger financial-literacy literature, theoretically grounding it in a salient particularized version of self-efficacy and aiming it toward the small-business/entrepreneurial audience to help prevent business failure. These connections are being made by other researchers, like Morris and
Altman (2012), who stated, “There is much evidence to support the view that financial education positively affects decision making. A person more educated on financial matters, such as concepts of risks, rates of return, credit card payments structures, and household budgeting, makes better decisions, at least from the perspective of the decision maker. Moreover, educating individuals to become more literate in numeracy should reduce errors in decision making. Financial education in this case is not directed towards changing human behavior, such as overcoming biases as defined by the conventional wisdom. Rather it is directed towards helping individuals who are boundedly rational to make better decisions—decisions informed by more specialized knowledge about financial issues, markets, and products. Following Shiller, one might argue that financial education should be subsidized when it has positive social effects, such as improving savings behavior and reducing the chances that poor budgeting and investment decisions will be made.” The “Shiller” in the above Morris and Altman quote is in reference to RJ Shiller, a leading behavioral finance scholar that they referenced repeatedly in their 2012 study. Even though Morris and Altman’s focus was primarily between the linkage of consumers’ financial behaviors and the concepts of financial literacy/education, the individuals these authors describe are often the same individual who are making financial decisions for small businesses.
CHAPTER II

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

The purpose of this study is to investigate the relationship between financial literacy, financial self-efficacy, and the importance of financial information to small business decision makers. Extant literature concerning the impact and failure of small business opens the chapter. Next, the chapter presents the current state of financial literacy research and then continues by discussing the evolution of the self-efficacy construct. Although self-efficacy is discussed for context, the version and measure of self-efficacy chosen as the most salient (due to the topic of this study) is financial self-efficacy. The literature review is concluded by discussing the acquisition and use of financial information before the hypothesis development section closes the chapter.

2.1 Small Business Definition, Importance, and Failure Rates

The Small Business Administration (SBA) determines if a business qualifies as a small business using a size standard expressed using annual receipts or number of employees, depending on the North American Industry Classification System (NAICS) code that matches the businesses’ industry. Previous research done in the United States has made the unstated assumption that entrepreneurs affiliated with the SBA and their partner, the Small Business Development Center (SBDC), are deemed small according to the SBA definition (Pearl & Eileen, 2014). On examining the SBA’s small business definitions, nearly every industry qualifies as small with
fewer than 500 employees, with the most stringent requirement being a few industries that use 100 employees as the threshold. The threshold’s mean was approximately 775 and median was 750 employees. Nearly half the classification used number of employees (505 out of 1,037 distinct industry classification codes), but a slight majority of industry size identifiers used annual receipts or dollars of assets. The mean threshold using annual receipts was just under $20 million with a median of $16.5 million. The most stringent threshold was $1 million for agriculture related industries.

Small businesses have an extremely large global economic impact, they are significant actors on the world economy, they are responsible for a substantial portion of the gross domestic product (GDP), and they employ a large share of the populace in many developing and developed countries (Babani & Sharma, 2015; Dickins, 2016; Yu-Ching, Kuo-Pin, & Yu, 2006). In the United States, small and medium-sized enterprises are responsible for 33.6% of the export value, and they employ 48% of private sector employees (Small Business Administration Office of Advocacy, 2016). Even though small businesses have such a significant impact (cumulatively) on the global economy, their smallness (individually) appears to come with a hefty downside – high rate of failure.

The Bureau of Labor Statistics collects information on the failure rate of small business as part of their Business Employment Dynamics data. The most recent data from the bureau shows that about 80% of small businesses survive their first year in business (for example, of all the small businesses that opened in March 2017, 79.4% made it to March 2018). About 70% of businesses will survive their second year in business (of all the small businesses that opened in March of 2016, only 69% made it to March of 2018). About 50% of businesses with employees will survive their fifth year in business (according to the SBA, of all the small businesses that opened in March of 2013, 50.7% made it to March of 2018.) About 34% of businesses
will survive their 10th year in business (the most recent data shows that of the small businesses that opened in March of 2008, 33.7% made it to March of 2018.)

Though the study of failure is a substantial literature, a constant definition for failure doesn’t exist within disciplines, let alone between disciplines (Ropega, 2011). To confuse the topic further, failure can go by different terms and the variety of different definitions go in tandem with different proxies (or measures) for the small business mortality rates being reported in these studies. Even some of the earliest research on failure noted this term’s range of definition and multiple uses for research (Sharma & Mahajan, 1980). Trying to explain the cause of business failure, being able to predict future failure, and the prevention of failure are often the stated goals of this research. Unfortunately, both in practice and theory, it is often hard to distinguish the difference between the causes and the symptoms of small business failure. In Ropega’s (2011) recent analysis of failure literature, many causes and symptoms were identified, but two foremost causes of small business failure were acknowledged as recurring in the literature: (1) management lacked knowledge of the business which led to inadequate management skills or practices and (2) insufficient capital was present, often due to too much debt or just poor capital management in general. These two primary causes for small business failure appear to parallel the irresponsible financial decisions being made by consumers, but in consumer literature these improper decisions and practices are often viewed as the result of individuals lacking financial literacy. In addition to these two primary causes of small business failure, Ropega (2011) also stated that, “small businesses are exposed to bigger threats because they simply do not have the support of extra finance or resources that larger companies typically possess, and because of their extremely poor ability to source financing from banking institutions” and that it is “important to recognize the early signs of business failure before it is too late for the situation to be resolved” (476). This led to four assumptions being made, connecting the business failure literature to that of the consumer financial behavior and financial literacy literature. First, a lack of financial knowledge qualifies as
poor knowledge of the business and results in inadequate management, which Ropega (2011) posited as a primary cause of small business failure. Second, being aware of businesses’s finances is even more important for small businesses, because their size makes it harder for them to source capital, thus they need to be able to recognize the signs of failure as soon as possible in order to take steps to prevent the failure (with the limited capital they still possess). Not being able to issue shares of stock or support large bond issuances is something that small business and individual consumers have in common. Third, in consumer research, financial education tends to lead to more responsible financial behaviors (e.g. improving savings behaviors, budgeting practices, and investment decision making); these same improvements in a small business decision making context may alleviate some of the strain on the small business’ limited capital as well. Fourth, lack of financial literacy means that the entrepreneurs will either lack the ability to generate or analyze financial information (e.g. financial statements and metrics). Having the information and the ability to use the information are both prerequisite to using the information to make more informed business decisions.

2.2 Financial Literacy

The term financial literacy is often used as a construct label for a wide range of connected concepts. These include a plethora of similar terms which often overlap in practice. These terms include, but are not limited to, phrases such as financial awareness, financial knowledge, financial skills, financial management, and financial capability. The root concern behind most of these different terms revolves around the subject’s ability to perform tasks such as calculate compound interest, manage their money, select financial products, and make general financial plans relating to spending, saving, and retirement. Thus, a working simplified definition for financial literacy is having the knowledge and skills to make responsible financial decisions. This is of course just one way to define financial literacy, but there are other names for fundamentally the same concept (as previously mentioned) and many similar ways of defining the construct. Nonetheless,
it is generally agreed that there is an overall lack of it in many populations and worldwide (Atkinson & Messy, 2011; Fonseca, Mullen, Zamarro, & Zissimopoulos, 2012; Klapper, Lusardi, & Panos, 2013; Klapper, Lusardi, & Van Oudheusden, 2015; Lusardi & Mitchell, 2007, 2011, 2014; Mandell & Klein, 2007, 2009; Nicolini, Cude, & Chatterjee, 2013; M. C. J. van Rooij, Lusardi, & Alessie, 2012). The ubiquitous lack of financial literacy leaves many individuals underprepared to make responsible decisions, and several specific groups (in the United States the most often cited as having lower financial literacy levels include women, African Americans, and Hispanics; but there have been conflicting findings in other populations) have already been acknowledged to be at a larger risk of low financial literacy than others (Lusardi & Mitchell, 2007). In the recent S&P Global FinLit Survey, it was found that only one out of three adults are financially literate worldwide, thus a vast majority of people are not able to make informed financial choices (Klapper et al., 2015).

The costs and benefits of financial literacy is mostly examined on a personal financial level, but comparatively little attention has been placed on financial literacy’s impact on small business decision makers. The study of financial literacy has typically focused on personal finance related topics (such as interest, personal savings, investing, and borrowing), but a lack of financial understanding has also been identified in small businesses (Brown, 2006; Dickins, 2016; Halabi et al., 2010). Personal finance data, planning retirement, education, and government regulation are a few of the topics discussed in chorus with financial literacy, but relatively little academic attention has been placed on the financial literacy of entrepreneurs and other small business decision makers.

Studies have shown financial knowledge appears to be correlated with some positive financial behaviors (i.e. paying credit card bills on time and having adequate savings), but unfortunately the effectiveness of financial education to improve financial knowledge and subsequent positive financial behaviors is generally seen as ineffective (Fernandes, Lynch, & Netemeyer, 2014;
Mandell & Klein, 2009). Even when individuals are seeking knowledge, and are being educated on financial topics, the knowledge doesn’t appear to “stick”. One culprit for this lack of “stickiness” is apathy and is most likely the result of a focus on consumption or lack of knowledge of the importance of the material (Mandell & Klein, 2007). Another likely culprit is the “decay of effects of financial education interventions” over time, which implies that “just-in-time” education may be more productive and reduce the amount of financial information that is forgotten prior to the decision making process (Fernandes et al., 2014).

Even though there is this lack of understanding relating to basic financial concepts, there is a plethora of financial services available to a wide range of the population. One can see this availability simply by driving around any small city and noting the number of same day, auto, tax refund, and payday loan establishments. Not to mention the more reputable lenders (e.g. banks and credit unions) and other financial service providers (e.g. accounting firms and financial investment companies). Overall, the number of people with bank accounts and access to financial services is increasing globally. The diversity and complexity of these potential services leave many unable to properly judge the utility of their options, thus leading the seekers of such services to make suboptimal decisions. This is most likely the case, due to the aforementioned low financial literacy levels, and numerous other academic studies have shown widespread financial illiteracy in many populations (Dickins, 2016; Fonseca et al., 2012; JSC, 2008; Klapper et al., 2013; Klapper et al., 2015; Lusardi & Mitchell, 2014). In these previous financial literacy studies, it has been shown that consumers with little understanding of financial topics (such as interest) are more likely to suffer from higher interest rates, fees, and run up higher debts. It would seem likely that small business decision makers with a relative lack of financial topic knowledge would also suffer from similar objectively negative situations, just as the general consumers do.
2.3 Self-Efficacy

Social Cognitive Theory (SCT) can be viewed as an expanded view or continuation of Bandura’s earlier work on Social Learning Theory (Bandura, 1977b). In Bandura’s 1977 work he added on to the theories of classical and operant conditioning (the traditional behaviorist view of learning) by focusing on what happens between a stimulus and the response. Bandura believed that it was through observation of their environment, and others’ behaviors, that humans learn what behaviors to model, emphasize, and imitate. The assertion that humans model their own behaviors based on the past experiences they have had with others’ behaviors and attitudes is referred to as observational learning and is a cornerstone of Bandura’s work. Bandura’s Social Learning Theory became SCT upon further development and additional focus on internal behavior reinforcements – specifically a construct to become known as “Self-Efficacy”. Self-efficacy refers to one’s belief or confidence in their ability to perform a specific task or behavior (Bandura, 1986, 1997).

Self-efficacy was first proposed in social learning theory as an individual’s belief in his or her capability to accomplish a job or a specific set of tasks (Bandura, 1977b). Self-efficacy plays a key role in SCT, and it has been used by researchers in many different fields, usually when examining the connection between external variables, internal beliefs, and their influence on behavior. Bandura’s theory predicts that learners are more likely to try, persist, and succeed in activities for which they have high levels of self-efficacy (Bandura, 1977a, 1986, 1997).

Therefore, social cognitive generally refers to one’s assessment of one’s ability to activate the mental resources needed, motivate, and take actions necessary to accomplish a specific task (Gist & Mitchell, 1992).

SCT has been applied to a wide variety of different areas, because of its educational psychology roots, where individual’s learning or mimicry of human behavior (usually based on their
environment) is of import. Thus, SCT has been used in many major areas of research – like education, parenting, public health, and business. In the business field, areas of study as general as organizational behavior, and as specific as entrepreneurship, use SCT for theoretical support. I have included a few exemplar studies that illustrate the broad range of areas that show the generalizability of SCT below:

- SCT theory (main focus was on self-efficacy) was used in an attempt to unify several individual theories related to academic/career interest, choice, and performance (Lent, Brown, & Hackett, 1994). SCT was used as the theoretical basis for several models included in the meta-analysis.

- Self-efficacy has been used to predict the relationship between financial literacy and financial behavior (Asaad, 2015).

- The effects of growing up poor/rich on narcissism, leader’s behavior, and leader effectiveness used observational learning as a theoretical basis for its study. Self-efficacy (which is usually considered a construct related to SCT) was also mention during the study, even though it cited social learning theory instead of SCT (Martin, Côté, & Woodruff, 2016).

The generalizability, which is normally considered to be strength in theory crafting, of SCT is due to how broadly the theory is structured. Human behavior is complex and SCT is aimed widely at the interaction between person, behavior, and environment. The theory purposely makes little attempt to limit how the three factors (person, behavior, and environment) are influencing each other. This broad reach can make SCT hard to operationalize, thus it is often used theoretically while its component constructs (such as self-efficacy) are used operationally as the variables of interest when performing studies. The individual SCT constructs, such as self-efficacy, have also been accused of being too broad. Bandura himself stated, “Particularized efficacy beliefs are most
predictive because those are the types of beliefs that guide which activities are undertaken and how well they are performed” (1997, p. 40). Bandura’s own belief that self-efficacy is too vague a construct to be operationalized in many circumstances spurred his push of what he deemed “particularized efficacy beliefs”. This support of a more “particularized” self-efficacy is echoed by other researchers, and has resulted in many separate constructs (entrepreneurial self-efficacy, financial self-efficacy, academic self-efficacy, environmental-change efficacy, and many others) being used frequently as an explanatory variable in many studies (McGee, Peterson, Mueller, & Sequeira, 2009). In addition, even these particularized self-efficacy measures tend to have many factors significantly related to them (Amatucci & Crawley, 2011; Chen, Greene, & Crick, 1998; Farrell, Fry, & Risse, 2016). Often these other significant factors are demographic in nature – such as age, race, education level, and gender. On initial examination, entrepreneurial self-efficacy does appear to be more predictive/explanatory than general self-efficacy when investigating areas involving entrepreneurship and small business. Other researchers believe that even the entrepreneurial self-efficacy construct is too broad to apply to many research circumstances (Amatucci & Crawley, 2011). The FSE construct may help to fill this need for an even more “particularized” measurement, and it has already been used in the education/counseling and entrepreneurship fields (Amatucci & Crawley, 2011; Lown, 2011).

Bandura’s own support of a more “particularized” self-efficacy is echoed by other researchers and has resulted in the construct of entrepreneurial self-efficacy (and many others) being used frequently as an explanatory variable in many recent studies in the entrepreneurship field (McGee et al., 2009). On initial examination, entrepreneurial self-efficacy does appear to be more predictive/explanatory than general self-efficacy when investigating areas involving entrepreneurship and small business. Other researchers believe that even the entrepreneurial self-efficacy construct is too broad to apply to many research circumstances (Amatucci & Crawley, 2011). Confidence is a variable that is often used nearly synonymously with self-efficacy, but in
this study, it will be a separate measure and will be used as a component of the more
particularized measure of interest - FSE. It is worth noting that confidence has already been used
in prior self-efficacy research as a mediator to help explain how investing knowledge influences
investing self-efficacy (Forbes & Kara, 2010), and a lack of confidence paired with diminished
sense of financial well-being has effects on student’s self-efficacy and goal setting (Fosnacht &
Calderone, 2017).

2.3.1 Self-Efficacy of Small Business Decision Makers (Entrepreneurs)

Miao, Qian, and Ma (2017) performed a meta-analysis of current literature concerning the
relationship between entrepreneurial self-efficacy, firm performance, and several proposed
moderators. Their study confirmed the strength in relationship between entrepreneurial self-
efficacy and firm performance, even when compared to other previously identified successful
factors of association - factors such as conscientiousness, openness to new experience, and human
capital (Miao, Qian, & Ma, 2017). There has been an abundance of research done on self-
efficacy and its effect on different outcomes, but an exploration of the connection between the
FSE and the financial literacy of small-business decision makers has not been done. The closest
research done relating to this connection was recently completed in a quasi-experimental study
performed on South African small business owners, connecting financial management training to
financial management skill and financial self-efficacy (Kirsten, 2018).

Why some business and entrepreneurial efforts succeed, while others do not perform as well or
fail outright, is a question of obvious importance to present and potential entrepreneurs.
Understanding and measuring the relationships between several factors is necessary to create a
clear picture of the benefits that certain conditions have on firm performance.
2.3.2 Financial Self-Efficacy

Financial self-efficacy (FSE) is a relatively new area of study, but it may prove a valuable explanatory variable in business research. For the purposes of this study, financial self-efficacy (FSE) is the belief or confidence in one's own capabilities to perform financial related tasks in a manner that results in desired outcomes. The above definition used throughout this study is a more “particularized” application of Bandura’s general self-efficacy construct (alluded to and developed through many of his publications mentioned earlier). The FSE construct may help to fill the need for an even more “particularized” measurement, and it has already been used in the education/counseling and entrepreneurship fields (Amatucci & Crawley, 2011; Lown, 2011). It is also worth noting that focused training does appear to improve both the short-term financial management skills and FSE (Kirsten, 2018).

A great deal of the recent research has been done on groups that are at a higher risk of lacking confidence in financial matters (such as women, minorities, and the elderly) and these less confident populations are identified as having lower financial self-efficacy (Amatucci & Crawley, 2011; Farrell et al., 2016). The significance of FSE, as an identifier separate from FL, was also shown to impact the number and type of financial products procured by women (Farrell et al., 2016). Other researchers noted that women tend to make less risky investments than men do, FSE is positively correlated to investment risk taking, and these two factors may indicate that it is FSE itself that accounts for the gender difference observed in financial risk-taking decisions (Montford & Goldsmith, 2016).

In behavior finance, FSE has already been found to be a significant moderator between the relationship between market volatility and financial satisfaction (S. Asebedo & Payne, 2019). Other researchers have noted that the amount of studies done to help understand the relationship between “sociodemographic and economic factors related to FSE” but “little is understood about
the psychological factors that contribute to FSE levels” (S. D. Asebedo, Seay, Archuleta, & Brase, 2019). FSE is itself a psychological factor and has recently been used to help explain the connection between the versatile cognitive style and disposition effect of investment behavior (Tang et al., 2019).

2.4 Procuring External Financial Specialists, Services, and Information

There have been several studies that have shown that managers are able to make more informed business decisions if they have access to accounting information, because they are able to understand the nature and accessibility of the resources available to exploit (Mike, Mike, & Monica, 2005; Wim, Chow, & Lin, 2006). More informed decisions lead to better decision, and in a recent study, it was shown that the profitability of both growing and nongrowing small businesses are positively affected by the use of certain accounting information (Andersén & Samuelsson, 2016). The possible sources of this valuable information can be easily expressed as a dichotomy – the information was the result of procuring external specialists or educating internal human capital. Thus, according to the current literature, increasing the use of either source should increase the firm’s financial performance.

Previous researchers found a significant difference between the information that was being created internally and the information that was sought from outside sources (Holmes & Nicholls, 1989). Many managers rely on the outside expertise of practicing accountants for statutory/regulatory services, and many of these managers are left bewildered by the complexity of the information provided (Sian, 2009). Many small business owners tend to have little knowledge regarding accounting information, and they generally rely on “informal assessments” such as the amount of cash in their businesses bank account as an indicator of performance (Halabi et al., 2010). It should then be no surprise why small business would be hesitant to procure more detailed accounting information from these same external sources. To make matters
worse, small business often require the external support because of the lack of in-house experts
and resources (Bennett & Robson, 2005), and it has been shown that individuals that are less
confident in their own financial abilities are less likely/able to procure these kinds of formal
financial services (Rachel & Musa, 2017). Quantifying the different types of accounting services
or information acquired will be discussed in more detail in the measurement section of this study,
but the three types for the sake of this study are comprised of statutory, budgetary, and other
additional accounting information.

For a visual simplification of the information incorporated in the literature review, we have
included a Venn diagram illustrating this study’s contribution in Figure 1.
2.5 Theory and Hypothesis Development

Many theories could be used to illustrate a relationship between financial literacy, FSE, firm performance, and entrepreneurial behaviors. The resource-based view, human capital, and transaction cost economics theory could all be used to study the impact that employees possessing specific knowledge and skills has on firm performance. In this study, I will theoretically structuring my findings using the self-efficacy component of the social cognitive theory.
developed spearheaded by Albert Bandura – discussed earlier in the literature review section of this paper.

As previously mentioned, the study of financial literacy has typically focused on personal finance related topics (such as interest, personal savings, investing, and borrowing), but a lack of financial understanding has also been identified in small businesses (Brown, 2006; Dickins, 2016; Halabi et al., 2010). Personal finance data, planning retirement, education, and government regulation are a few of the topics discussed in chorus with financial literacy, but relatively little attention has been placed on financial literacy’s impacts on small business decision makers. Due to their size, and the specialized nature of entrepreneurial activities, small businesses are likely suffering from this same lack of financial understanding that plagues the general public. The general public has been found to lack even a basic understanding of financial concepts, leaving a large portion of the population unable to make knowledgeable choices regarding saving, investing, borrowing, and many other critical decisions. Many explanatory and causal factors associated with this lack of financial literacy and the negative financial behaviors resulting from it is well documented in the consumer finance literature previously mentioned.

In this study, I theorize that a lack in small-business decision-maker’s financial self-efficacy (FSE) helps explain the connection between the entrepreneurs’ FL levels with their business behaviors and perceptions. Bandura explains that perceived self-efficacy is critical component of social cognitive theory “because it acts upon the other classes of determinants” and makes “an important contribution to the acquisition of the knowledge structures on which skills are founded” (Bandura, 1997, p. 35). Thus, logic would dictate that if self-efficacy is important in the acquisition of knowledge, and one component of FL is the possession of financial knowledge, that FSE would be an important component in the acquisition of FL. Surprisingly, this theoretical based interaction between FL and FSE was reversed (FL was seen as the causal factor instead of FSE) in the prior studies that performed structural equation modeling that included these two
factors. When investigating the relationship between FL, FSE, financial attitudes, and financial inclusion, Mindra and Moya found that FSE partially mediated the effect of FL on financial inclusion, where financial inclusion was defined as “the purposeful expansion to access and use of financial products and services” (Mindra & Moya, 2017). In addition, a study performed on Canadian low-income families found that FSE fully mediated the relationship between objective financial knowledge and certain savings behaviors (Rothwell et al., 2016). Because of this empirical evidence concerning the FSE and FL relationship, my first hypothesis is as follows:

**H1: There is a significant positive relation between Financial Literacy (FL) and Financial Self-Efficacy (FSE)**

There have been several studies that have shown that managers are able to make more informed business decisions if they have access to accounting information, because they are able to understand the nature and accessibility of the resources available to exploit (Mike et al., 2005; Wim et al., 2006). Without the knowledge, ability, or belief that the entrepreneur could use this financial information – the financial information would not be procured to the same extent. As mentioned previously, many small business managers are left befuddled by the information provided by these financially literate specialists (Sian, 2009). Therefore, it is not surprising that small businesses are hesitant to procure more detailed financial knowledge from these same external sources. It has been found that individuals that are less confident in their own financial abilities are less likely or able to procure these kinds of formal financial services (Rachel & Musa, 2017). Thus, my second hypothesis is as follows:

**H2: FSE mediates the relationship between FL and procurement of financial information/services beyond those required by statute or legislation.**

Prior research done on personal investment showed that FSE fully mediated the relationship between objective financial knowledge and certain savings behaviors (Rothwell et al., 2016).
Other researchers found that overconfident individuals engage in riskier financial behaviors. I posit that FSE will also mediate a similar relationship in the small business, the one between FL (which is comprised of financial knowledge and confidence measures) and the use of financial information in decision-making behaviors. Without the knowledge, ability, or belief that the entrepreneur could use this financial information, why would they use it when making decision? Thus, my third hypothesis is as follows:

**H3: FSE mediates the relationship between FL and use of financial information for decision making.**

The final prediction in this study concerns perceived financial performance of the small business. Bandura believed that human behaviors could be predicted more accurately by considering both the efficacy beliefs and the outcome expectancies of the individual (Bandura, 1997, p. 20), while other researchers fundamentally linked FSE to positive outcome expectations (Farrell et al., 2016). Thus, my fourth and final hypothesis is as follows:

**H4: FSE mediates the relationship between FL and perceived financial performance.**

A conceptual illustration of the research hypotheses is shown in Figure 2.
**Figure 2.** A Conceptual Illustration of the Research Hypotheses.
CHAPTER III

RESEARCH METHODOLOGY

The purpose of this study is to assess the financial self-efficacy, financial literacy, and select financial decision-making behaviors of entrepreneurs. This chapter discusses the general study design, research questions, variables, instrumentation, population, and sample.

3.1 Research Design

The goal of this study is to examine the relationship between financial literacy, financial self-efficacy, and business-related decision-making behaviors found in entrepreneurs and other small business decision makers. This study is considered a nonexperimental quantitative survey design, thus relationships between variables are investigated but the variables are not manipulated. This is consistent with methods used in many consumer centric financial literacy studies (Asaad, 2015; Fernandes et al., 2014; Lusardi, 2008; Lusardi & Mitchell, 2011, 2014; Mandell & Klein, 2009; REMUND, 2010), and the few FSE studies that exist (Amatucci & Crawley, 2011; S. Asebedo & Payne, 2019; S. D. Asebedo et al., 2019; Farrell et al., 2016; Fosnacht & Calderone, 2017; Kirsten, 2018). In such research, an overall financial literacy score is based on the number of correct answers. The financial literacy score is a simple sum of the number of correctly answered financial literacy questions, a score per specific domain or concept (such as interest compounding, inflation, and diversification) is also usually reported, as it is in this study.
Often correlations are then made between these scores and the researchers’ other variables of interest (such as the consumers’ investment behaviors or demographic variables), as it is in the data analysis chapter of this study. The use of surveys and polls still appear to be the preferred method among most financial literacy researchers and this has been observed in prior literature review papers concerning financial literacy (REMUND, 2010). Thus, to collect the necessary sample data for this study, a questionnaire was created, tested, and distributed to entrepreneurs responsible for making small business decisions. This robust questionnaire includes questions used to measure various aspects of financial self-efficacy, financial literacy, and select financial behaviors as well as pertinent demographic information.

3.2 Research questions

Specifically, this study will help to answer the following research questions:

1. How do the financial literacy and financial self-efficacy profiles relate to one another?

2. What is the relationship between financial literacy and financial self-efficacy profiles and entrepreneurial decision-making behaviors?

3. Do these financial literacy and financial self-efficacy profiles impact perceived financial performance?

3.3 Variables

Financial literacy (tested financial knowledge and self-perceived knowledge) – Based on individual’s use of knowledge in conjunction with their financial attitudes when attempting to used fiscal resources effectively. The result of correctly using information to make knowledgeable economic decision is thus measured objectively, and a higher number of correctly answered questions indicates a higher degree of financial knowledge when compared to those that did not correctly use the provided information when tested. Self-perceived knowledge is a
subjective self-reported measure of the subject’s knowledge of financial topics. This bifurcated view and measure of financial literacy has been created and adopted by multiple researchers (Asaad, 2015; Sam & William, 2013). Overconfidence (i.e. an overly high estimation of one’s own abilities when compared to observable achievement or ability) as a variable was one natural extension of this bifurcated view of financial literacy, in previous research, and was used to identify the line in which confidence performs a positive roll (overcome avoidance tendency or risk aversion) and when it becomes harmful (increases tendency toward unwarranted risk-taking behaviors) during the decision making process (Asaad, 2015).

**Financial self-efficacy** – As mentioned previously, financial self-efficacy (FSE) is the belief or confidence in one’s own capabilities to perform financial related tasks in a manner that results in desired outcomes. While FSE is a relatively new construct, it is just a more “particularized” version of the self-efficacy construct developed by Bandura. Financial self-efficacy shares some similarities with self-perceived knowledge (i.e. the two are both self-reported measure of perceived aptitude) and confidence (i.e. the two are often described using terms like belief and certainty), but FSE has more in common with the broader yet distinct psychological construct of self-efficacy, from which it was developed. The FSE construct requires a broader look into human behavior (choice to engage or avoid tasks), motivation (persistence of effort), and performance outcomes. Which is not usually the case for less specific terms like self-perception and confidence.

**Additional financial services** – Prior research has quantified accounting information by logically breaking it into three distinct groups comprised of three different types of information (Holmes & Nicholls, 1989). These three distinct types of information, as discussed by Holmes & Nicolls, are as follows: 1. Statutory – required by legislation or government authority, such as those required by taxation authorities like the IRS. 2. Budgetary – financial plan that makes use of future period incomes and expenses estimates. 3. Additional – is a blanket description for any accounting
information obtained beyond those deemed statutory or budgetary. These three information types are then grouped together into parties that either create internally or procure externally an ever-increasing amount of financial information. The first group procures the least information (statutory information only or ST), group two accesses more (statutory and budgetary information or SB), while the third group accesses the most financial information (statutory, budgetary, and additional information or SBA).

**Demographic information** – The standard demographic information collected in similar research includes age, gender, education level, and industry specialization of subject.

### 3.4 Instrumentation

There are four primary types of information being collected by the survey instrument for measurement: 1. demographic data, 2. financial literacy measures, 3. financial self-efficacy measures, and 4. information use in business decision making.

**Demographic** - The demographic information to be collected is as follows: gender, age, ethnicity (White, Hispanic or Latino, Black or African American, Native American or American Indian, Asian / Pacific Islander, and Other), marital status (married, single, separated/divorced, widowed) education level (Did not complete high school, high school, GED, some college, Associates degree, Bachelor’s degree, and Master’s degree or higher), years of business experience, size of business (based on number of employees), and industry of focus (Agriculture; Mining; Utilities; Construction; Manufacturing; Wholesale; Retail; Transportation and Warehousing; Information; Finance and Insurance; Real Estate, Rental and Leasing; Professional, Scientific, and Technical Services; Health Care and Social Assistance; Other Industry). These generic industry descriptions were collected in lieu of the more specific NAICS code. Similar thresholds for classifying a business as small are present across multiple NAICS codes in an overarching industry
classification. The collected industry and number of employee data will be compared to the NAICS codes to verify those participants meet the threshold.

**Financial Literacy** – Traditional financial literacy measures usually are derived from testing an individual’s ability to answer several questions relating to different financial topics or concepts. The questions asked and the number of questions tend to vary depending on the overall focus, viewpoint, or needs of the study. One set of researcher illustrated these different focuses by “using the examples of consumer education and on the other hand the financial services sector” (Schuhen & Schürkmann, 2014). In this study, I will be following in the tradition of consumer education research when looking at financial literacy—rather than the more economic development focused, policy driven, financial services sector viewpoint—but instead of looking at the general or personal consumers I will be specifically looking at small business decision makers. Schuhn & Schürkmann (2014) described this consumer education tradition by stating, “Imparting financial knowledge aims at recognizing financial services (risks and rewards) and at applying that knowledge in the process of choosing financial services in real life. The aim ‘to transfer knowledge’ is expanded by the objectives ‘generate comprehension’ and ‘decision-making power’ in the area of personal finances” and the purpose of the research is this study is the same but is instead aimed at the area of small-business finances.

The basic financial knowledge and financial confidence (or self-perceived financial knowledge) questions being used in this study are sourced from the Financial Regulatory Authority’s (FINRAs) 2012 National Financial Capability Study (NFCS). The FINRAs study was completed with the support of the U.S. Department of the Treasure and focused on measuring American’s money skills. The NFCS was a nationally distributed, state-by-state, online survey with a total sample of 25,509 Americans.
There is not an uncontested generally accepted measure for financial literacy, but there is a plethora of commonly used measures available. The selection of the measures from the NFCS was done for a few primary reasons. First, prior research has already used the 2012 NFCS results to assess the connection between financial knowledge, confidence, and consumer financial behaviors (Asaad, 2015), which parallels the aspirations of this study (just with small business financial behaviors as the aim), and no similar study exists making the connection between financial knowledge, confidence, and small-business decision making behaviors. Second, three of its five financial knowledge questions (number 1, 2, and 5 from Table A1 in the appendix) are derived from a standard set of financial literacy questions used in many other surveys (Lusardi & Mitchell, 2014), and this three question assessment is possibly the closest to a generally accepted measure of financial literacy that we have today. Third, the Lusardi & Mitchell had to be simple, relevant, short, and be able to differentiate knowledge results for comparison, but this extreme brevity (three questions) doesn’t allow for the number of questions deemed necessary in most competence assessments, though its validity was verified “within the contest of the Health and Retirement Study 2004” (Schuhen & Schürkmann, 2014). Including two additional questions (number 3 concerning bonds and number 4 concerning mortgages) may increase the length beyond the standard three used in numerous other studies but increases the ability of our instrument to test the participants’ ability to understand more complex specific financial instruments commonly used to finance larger acquisitions. Fourth, commonly used alternative measures of financial literacy – such as the Jump$tart survey developed by the Coalition for Personal Financial Literacy (J$C, 2008) – are often substantially longer. This departure from the brevity enjoyed by the instrument developed by Lusardi & Mitchel, makes it harder to administer to non-captive audiences. A captive audience (i.e. a population that is required to take the survey, such as high school or college students that are required to take it, as part of a course or school requirement) is the usual target of instruments that are as long as the Jump$Start survey (31 knowledge questions are included in the first part of this survey) administered and published by
other prolific financial literacy researchers, such as Mandell and Klein (Mandell & Klein, 2007, 2009).

The financial confidence, or perceived knowledge, component in this study is being included primarily due to the recent finding showing a connection between financial knowledge, perceived knowledge, financial satisfaction, financial behaviors, risk aversion, sociodemographic variables, and advice seeking (Asaad, 2015; Robb, Babiarz, & Woodyard, 2012). Asaad’s findings were based on the 2012 version (had three components making up financial confidence) and Robb et al.’s was based on the 2009 version (had four components making up financial confidence) of the FINRA survey.

On preliminary examination, the measures included in the NFCS for financial knowledge (interest, inflation, bonds, mortgages, and diversification) and confidence (overall, day-to-day, and math related) are applicable to small-business decision makers, thus appear to have face validity in this specific context, and are used in many other similar but consumer focused financial literacy studies. In addition, previous validation of many of these and other financial literacy measures has been performed, reported, and debated in prior studies (Hung, Parker, & Yoong, 2009; Knoll & Houts, 2012; Schuhen & Schürkmann, 2014; M. van Rooij, Lusardi, & Alessie, 2011). Even the larger financial literacy instrument used in the JumpStart survey had some issues with internal consistency and validity affirmation (Lucey, 2005), while still others report that there is no valid measure for the totality of financial literacy (Potrich, Vieira, & Mendes-Da-Silva, 2016). In addition to the five domains used in the NFCS instrument used to measure financial knowledge, with the aid of an expert panel, five additional domains were identified as being specifically salient to small business decision makers. This is in the spirit of Lusardi and Mitchell’s own recommendation, when they state that it is, “imperative to expand the range of measures of financial literacy, so as to better evaluate the types of problems that people find most difficult” (Lusardi & Mitchell, 2009). These five new business financial literacy
domains consist of return on assets (ROA), free cash flow, gross profit, cash budgeting, and accruals. By collecting information on the five more general consumer domains and the five new more business centric domains, selected in this study, additional analysis can be done comparing the predictive power of the measures separately and in conjunction with one another. See Table A1 in the appendix for selected financial literacy measures and additional information.

In addition to making the connection between financial knowledge, confidence, and small-business behaviors; the current study will examine the impact that FSE has on these relationships in a small-business (or entrepreneurial) context.

**Financial Self-Efficacy** – The measure for this variable was acquired from Lown, J.M. (2011). Development and Validation of a Financial Self-Efficacy Scale. Journal of Financial Counseling and Planning, 22(2), 54-63. The construct of FSE is relatively new, but Lown’s instrumentation was adapted from more established general self-efficacy measures. The measures were then validated in Lown’s study and have already been used in a few other studies (Farrell et al., 2016; Kirsten, 2018; Rachel & Musa, 2017). See Table A3 in the appendix for Lown’s survey questions measuring FSE and this studies summary statistics.

**Additional financial services (financial decision-making behavior)** – As mentioned previously in the variables section of this paper, prior research has quantified accounting information by logically breaking it into three distinct groups comprised of three different types of information (Holmes & Nicholls, 1989). To operationalize the request for the type of information procured by the subject, participants rated themselves on the type of information they had available to them concerning their business, using a 7-point Likert where a “1” reflects strongly disagree, “4” reflects neither agree/disagree, and a “7” reflects strongly agree. The three types of information to be rated included Statutory, Budgetary, and Additional Information. For the full inquiry and statistical results see Table A4 in the appendix.
Basic financial information preparation/use (financial decision-making behavior) – To measure if financial information is being used during the business decision making process, items were adapted from a case study performed by Dahmen and Rodríguez "Financial Literacy and the Success of Small Businesses: An Observation from a Small Business Development Center" (Pearl & Eileen, 2014). Replacement of terms such as “business owner” with “you” and some rephrasing was performed to result in the four measures included in Table A4 in the appendix. These adapted measures focus on the use of financial information (measured as a binary choice – yes or no) rather than a level of knowledge, confidence, or self-efficacy when using financial information.

Perceived financial performance – To operationalize this variable, the respondents were asked to estimate the profitability of their business during the previous four years (on average) in relation to their competitors. A five-point Likert scale ranging from ‘much lower’ to ‘much higher’ was used to collect this response. A subjective performance measures can be used and asking respondents to relate their performance to their competitors can provide a more accurate picture of the performance of a firm than using objective data not related to competitors (Dess & Robinson, 1984). A correlation between this subjective measure and more objective archival performance measures has also been observed in prior research, similar scales were used, and methodological approach was validated in previous studies (Andersén & Samuelsson, 2016; Santos & Brito, 2012; Wiklund & Shepherd, 2003).
CHAPTER IV

DATA ANALYSIS AND RESULTS

4.1 Introduction

In this study, I examined the correlational relationship between the level of financial self-efficacy, financial literacy, procurement of financial services, financial information use, and perceived financial performance of small-business owner and operators. Also, additional demographic information was collected and examined during the analysis. Given the previous research discussed in the literature review the following hypotheses were made: 1. There is a significant positive relation between Financial Literacy (FL) and Financial Self-Efficacy (FSE), 2. FSE mediates the relationship between FL and procurement of financial information/services beyond those required by statute or legislation, 3. FSE mediates the relationship between FL and use of financial information for decision making, 4. FSE mediates the relationship between FL and perceived financial performance. Participants were asked about their financial knowledge, beliefs, behaviors, and the use of financial information in their business, as well as several demographic, industry, and experience questions. In total, the survey instrument consisted of 37 questions.

This chapter is to provide an overview of the findings of this study and discuss the results of the analyzation of survey data collected to test these hypotheses. This chapter begins with a disruption of the survey distribution process, population refinement, and information concerning the survey recipients.
4.2 Population Refinement and Dissemination of Survey

The target population for this study is that of entrepreneurs and other individuals involved in the decision-making processes of small businesses. Specifically, partnerships and existing community relationships with entities involved with the target population (such as the regional branches of the U.S. Small Business Administration, Small Business Development Center, local small business owners, and small to medium sized local CPA firms) were tapped to identify potential participants and increase size of distribution. After receiving IRB approval, approximately 20 contacts were individually emailed a link to the survey by the researcher in the month of February. These individuals were known to be small-business decision makers in the researcher’s local community. This was initially performed as a pilot study to verify the feasibility of the approach before the instrument was used in the larger scale distribution. No changes were made to the survey, due to the pilot study, and the same instrument was utilized during the distribution performed by the local Small Business Development Center (SBDC). The local SBDC branch utilizes a system known as HubSpot to manage its mailing lists, customer support, and marketing activities. The HubSpot account used for the mailing list managed 4 different programs, with a total number of contacts being 18,592, of which the SBDC’s contact number was 7,540.

The overall SBDC email contact list is made up primarily of small business owners and operators, but also includes other small business stakeholders including lenders, government agencies, international contacts, and other business service providers. After several conversations with the Program Coordinator, they were able to exclude entire lists of government contacts, international contacts, and other business service providers, resulting in a total of 4,689 unique contacts that were sent this study’s survey. The pairing down of the sample was done to focus on the intended sample population, being small-business owners and decision makers, thus there was a need to eliminate other contacts (such as government agencies, international contacts, and other business
service providers). Information pertaining to this study’s survey was sent out a total of 3 times during the months of April and May. A notice about the upcoming survey was sent on April 23, 2020, the first distribution of the survey occurred on April 24, 2020, and a reminder to complete the survey was sent on June 12, 2020.

An additional benefit of using the HubSpot service was the researcher was able to gather additional statistics on number of contacts receiving the distribution of the survey and actually open each email. The following information was compiled by distribution date: April 23, 2020 (notice about the survey coming soon) sent to full SBDC email list (5,284 contacts) with an open rate of 13.5%, April 24, 2020 (first survey distribution) sent to focused population (4,689 contacts) with an open rate of 13.2%, and June 12, 2020 (survey reminder) sent to updated focus population (4,671 contacts) with an open rate of 14.3%. Only 18 possible recruits were lost between the first and second SBDC survey distribution, which was likely due to them unsubscribing from the mailing list between those two dates. Therefore, the number of contacts that received the opportunity to be recruited into the study was likely below 619 – 668 (the total number of contacts that opened each of those two mailings). After 4 months of collecting survey results from personal contact and through the help of the local Small Business Development Center (SBDC), data was collected on 68 recruited participants.

4.3 Consent and Description of the Final Sample

Participation was voluntary and the data was collected anonymously with the use of Qualtrics. Before beginning the survey, all recruits were asked whether they agreed to participate in the survey and they were told that they survey was being used to gather information about small business decision makers’ financial knowledge, beliefs, behaviors, and the use of financial information in their business. Information about IRB approval and consent to participate was presented first, after they clicked on the survey link. No payment or other consideration was
provided in exchange for participating, thus there was no incentive for unqualified participants to participate in the survey. Even though participants gave consent at the start of the survey, they were able to select an option marked as “Prefer not to say” on every question.

After excluding the significantly incomplete surveys and those that indicated that they did not wish to participate, the sample consists of 50 small-business decision makers. There was no time limit allotted for participants, and the median completion time was approximately 12 minutes. The demographic characteristics of the final sample are in Table 1, at the end of this section. The final sample consisted of participants primarily between the ages of 35-74, making up 90% of the sample. No participants older than 74 nor younger than 25 were reported, and the largest age bracket consisted of 30% of the sample being 45-54 years old. A small majority of participants were Male (54%), while a large majority identified as White (94%) and Married (80%). The sample was also highly educated, with 72% having completed a 4-year degree program or higher, and 24% had some college or completed a 2-year degree.

In addition to the more generic demographic information discussed in the prior paragraph, it was found that nearly half (47%) of the sample participants had a college major or coursework in a business-related field, while a slight majority did not or preferred not to say. Participants had an average of 15.9 years’ worth of entrepreneurial business experience. Responses also indicated that participants’ largest current entrepreneurial endeavor had an average of 14.9 current employees, primarily fitting into the following industries: Retail (12%), Manufacturing (16%), Other Industry (22%), and the remaining 9 industries each making up 8% of the sample or less.
Table 1 Characteristics of the Sample

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total Sample</strong></td>
<td>50</td>
<td>100</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>22</td>
<td>44.0</td>
</tr>
<tr>
<td>Male</td>
<td>27</td>
<td>54.0</td>
</tr>
<tr>
<td>Prefer not to say</td>
<td>1</td>
<td>2.0</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>65 - 74</td>
<td>11</td>
<td>22.0</td>
</tr>
<tr>
<td>55 - 64</td>
<td>10</td>
<td>20.0</td>
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<tr>
<td>45 - 54</td>
<td>15</td>
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<tr>
<td>35 - 44</td>
<td>9</td>
<td>18.0</td>
</tr>
<tr>
<td>25 - 34</td>
<td>4</td>
<td>8.0</td>
</tr>
<tr>
<td>Prefer not to say</td>
<td>1</td>
<td>2.0</td>
</tr>
<tr>
<td><strong>Ethnicity</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black or African American (2)</td>
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<td>2.0</td>
</tr>
<tr>
<td>Hispanic or Latino (3)</td>
<td>1</td>
<td>2.0</td>
</tr>
<tr>
<td>Prefer not to say (99)</td>
<td>1</td>
<td>2.0</td>
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<tr>
<td>White (1)</td>
<td>47</td>
<td>94.0</td>
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<tr>
<td><strong>Marital status</strong></td>
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<tr>
<td>Divorced/Separated (2)</td>
<td>6</td>
<td>12.0</td>
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<tr>
<td>Married (1)</td>
<td>40</td>
<td>80.0</td>
</tr>
<tr>
<td>Prefer not to say (99)</td>
<td>1</td>
<td>2.0</td>
</tr>
<tr>
<td>Single (3)</td>
<td>2</td>
<td>4.0</td>
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<tr>
<td>Widowed (4)</td>
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<td>2.0</td>
</tr>
<tr>
<td><strong>Education</strong></td>
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<td></td>
</tr>
<tr>
<td>Doctorate (6)</td>
<td>2</td>
<td>4.0</td>
</tr>
<tr>
<td>Professional/Master’s degree (5)</td>
<td>16</td>
<td>32.0</td>
</tr>
<tr>
<td>4 year degree (4)</td>
<td>18</td>
<td>36.0</td>
</tr>
<tr>
<td>2 year degree (3)</td>
<td>3</td>
<td>6.0</td>
</tr>
<tr>
<td>Some college (2)</td>
<td>9</td>
<td>18.0</td>
</tr>
<tr>
<td>High school graduate (1)</td>
<td>1</td>
<td>2.0</td>
</tr>
<tr>
<td>Prefer not to say (99)</td>
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<td>2.0</td>
</tr>
<tr>
<td><strong>Distribution</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pilot</td>
<td>11</td>
<td>22.0</td>
</tr>
<tr>
<td>SBDC</td>
<td>39</td>
<td>78.0</td>
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<tr>
<td><strong>Industry</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Construction (1)</td>
<td>2</td>
<td>4.0</td>
</tr>
<tr>
<td>Finance and Insurance (2)</td>
<td>3</td>
<td>6.0</td>
</tr>
<tr>
<td>Health Care and Social Assistance (3)</td>
<td>2</td>
<td>4.0</td>
</tr>
<tr>
<td>Information (4)</td>
<td>3</td>
<td>6.0</td>
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<tr>
<td>Manufacturing (5)</td>
<td>8</td>
<td>16.0</td>
</tr>
<tr>
<td>Other Industry (6)</td>
<td>11</td>
<td>22.0</td>
</tr>
<tr>
<td>Professional, Scientific, and Technical Services (7)</td>
<td>4</td>
<td>8.0</td>
</tr>
<tr>
<td>Real Estate, Rental, and Leasing (8)</td>
<td>4</td>
<td>8.0</td>
</tr>
<tr>
<td>Retail (9)</td>
<td>6</td>
<td>12.0</td>
</tr>
<tr>
<td>Transportation and Warehousing (10)</td>
<td>4</td>
<td>8.0</td>
</tr>
<tr>
<td>Wholesale (11)</td>
<td>2</td>
<td>4.0</td>
</tr>
<tr>
<td>Prefer not to say (99)</td>
<td>1</td>
<td>2.0</td>
</tr>
</tbody>
</table>
4.4 Analysis Overview

Data from this survey was first exported from Qualtrics in .xls format and then imported into JMP for most of the analysis. To check the reliability and validity of the selected scales, the following procedures were performed: item analysis, split-half analysis, reliability analysis (Coefficient alpha and the standard error of measurement), correlation analysis, and factor analyses (exploratory factor analysis and confirmatory factor analysis). All variables were included in a multiple regression, which was used to determine whether financial literacy score (composed of financial knowledge and confidence) and FSE predicted the three remaining depended variables. Path analysis was run in a multivariate environment, by using the R Studio software. The Preacher and Hayes (2004) approach for mediation analysis, which consists of assessing the indirect effects through a bootstrapping process, was also utilized in this study. Confidence intervals were examined using the method that results in the smallest confidence band (Tukey, Scheff, or Bonferroni). In addition to the procedures promoted by Preacher and Hays (bootstrapping and formally testing the indirect effects), the verification of the hypothesized relationship, statistical power, and potential alternative relationships between variables were also investigated.

Performing logistic regressions was used to predict whether individuals will procure additional financial services, use financial information during decision making, and positively view their financial performance. An average confidence level was used during most of the analysis, following the method used by Robb, Babiarz, and Woodyard (2012). Cross-tabulations and graphic representations of key descriptive statistics were also displayed for additional analysis.

4.5 Analysis of Hypotheses and Discussion

Hypothesis one states that there is a significant positive relation between Financial Literacy (FL) and Financial Self-Efficacy (FSE). To test this, a series of linear regressions were performed...
using JMP and the results are seen below in Table 2 and 3. A discussion of the findings and description of the measures are included between the two following tables.

Table 2. Linear Regression Statics - FSE and FL.

<table>
<thead>
<tr>
<th>Source</th>
<th>DF</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F Ratio</th>
<th>Prob &gt; F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>1</td>
<td>4.688605</td>
<td>4.68861</td>
<td>13.3319</td>
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<tr>
<td>Error</td>
<td>48</td>
<td>16.880839</td>
<td>0.35168</td>
<td></td>
<td>Prob &gt; F</td>
</tr>
<tr>
<td>C. Total</td>
<td>49</td>
<td>21.569444</td>
<td></td>
<td>0.0006*</td>
<td></td>
</tr>
</tbody>
</table>

Summary of Fit
- RSquare: 0.217373
- RSquare Adj: 0.201068
- Root Mean Square Error: 0.593030

<table>
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<tr>
<th>Source</th>
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<th>F Ratio</th>
<th>Prob &gt; F</th>
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<tbody>
<tr>
<td>Model</td>
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<td>3.356405</td>
<td>3.35640</td>
<td>8.8457</td>
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<tr>
<td>Error</td>
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<td>18.213039</td>
<td>0.37944</td>
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<td>Prob &gt; F</td>
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<td>C. Total</td>
<td>49</td>
<td>21.569444</td>
<td></td>
<td>0.0046*</td>
<td></td>
</tr>
</tbody>
</table>

Summary of Fit
- RSquare: 0.155609
- RSquare Adj: 0.138018
- Root Mean Square Error: 0.615986

<table>
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<tr>
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<th>Mean Square</th>
<th>F Ratio</th>
<th>Prob &gt; F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
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<td>4.78057</td>
<td>13.6678</td>
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<tr>
<td>Error</td>
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<td>0.34977</td>
<td></td>
<td>Prob &gt; F</td>
</tr>
<tr>
<td>C. Total</td>
<td>49</td>
<td>21.569444</td>
<td></td>
<td>0.0006*</td>
<td></td>
</tr>
</tbody>
</table>

Summary of Fit
- RSquare: 0.221636
- RSquare Adj: 0.205420
- Root Mean Square Error: 0.591412

Table 2 continues on the following page.
The General Financial Knowledge (GFK) Score is the sum of correct responses to the first five questions from Table A1 and are comprised of the five key areas: 1. Interest, 2. Inflation, 3. Bonds, 4. Mortgages, and 5. Risk. The Business Financial Knowledge (BFK) Score is the sum of correct responses to questions six through ten from Table A1 and which are comprised of the five new key areas: 6. Return on Assets (ROA), 7. Free Cash Flow, 8. Gross Profit, 9. Cash Budgeting, and 10. Accruals. The Total Financial Knowledge (TFK) Score is the sum of correct responses to all ten key areas just mentioned above. All three of the financial knowledge scores included above (GFK, BFK, and TFK) are representative of the traditional view of measuring financial literacy. It was previously discussed, in the variables section of this report, that a bifurcated view of financial literacy has also been taken by other researchers investigating both financial knowledge and financial confidence (or self-perceived financial knowledge) mentioned previously. Thus, FL Combined is the sum of TKF and self-perceived financial knowledge. The observed p-values are significant at the 0.05 level for all four financial literacy measures with the FL Combined being the most significant, and the relationships were found to be positive. It is for this reason that the FL Combined variable will be used when testing for mediation in the remaining three hypothesis. It is also worth noting how close the results of the GFK and TFK models are in comparison to the BFK and FL Combined models.
Additional regressions were performed on the self-reported knowledge measure to further assess the effectiveness of financial confidence (perceived financial knowledge) as a measure for financial literacy as other previously mentioned studies have done. This has the additional benefit of examining the relationship that perceived financial knowledge shares with the tested GFK and FSE measures, even though it wasn’t strictly necessary to test the first hypothesis. As seen on Table 3 below, the observed p-values are significant at the 0.05 level, and the relationships were found to be positive. In addition, you can see Perceived Financial Knowledge has a moderate correlation with both the GFK Score (0.68) and FSE (0.57).
Table 3. Linear Regression Statics – Self-reported Financial Knowledge.

### GFK Score – Perceived Financial Knowledge

<table>
<thead>
<tr>
<th></th>
<th>Value</th>
<th>Lower 95%</th>
<th>Upper 95%</th>
<th>Signif. Prob</th>
</tr>
</thead>
<tbody>
<tr>
<td>Correlation</td>
<td>0.678452</td>
<td>0.493253</td>
<td>0.804814</td>
<td>&lt;.0001*</td>
</tr>
<tr>
<td>Covariance</td>
<td>0.781497</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Std Dev</th>
</tr>
</thead>
<tbody>
<tr>
<td>GFK Score</td>
<td>4.34</td>
<td>1.135872</td>
</tr>
<tr>
<td>AVG Fin Confidence</td>
<td>6.12</td>
<td>1.014096</td>
</tr>
</tbody>
</table>

#### Summary of Fit

- **RSquare**: 0.460297
- **RSquare Adj**: 0.449053
- **Root Mean Square Error**: 0.752721
- **Mean of Response**: 6.12

#### Source

<table>
<thead>
<tr>
<th>Source</th>
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<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F Ratio</th>
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</thead>
<tbody>
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<td>Model</td>
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<td>23.194865</td>
<td>23.1949</td>
<td>40.9378</td>
</tr>
<tr>
<td>Error</td>
<td>48</td>
<td>27.196246</td>
<td>0.5666</td>
<td>Prob &gt; F</td>
</tr>
<tr>
<td>C. Total</td>
<td>49</td>
<td>50.391111</td>
<td>&lt;.0001*</td>
<td></td>
</tr>
</tbody>
</table>

#### Parameter Estimates

| Term             | Estimate | Std Error | t Ratio | Prob>|t| |
|------------------|----------|-----------|---------|-----|
| Intercept        | 3.491195 | 0.424429  | 8.23    | <.0001* |
| GFK Score        | 0.605716 | 0.094669  | 6.40    | <.0001* |

### Perceived Financial Knowledge Score - AVG FSE

<table>
<thead>
<tr>
<th></th>
<th>Value</th>
<th>Lower 95%</th>
<th>Upper 95%</th>
<th>Signif. Prob</th>
</tr>
</thead>
<tbody>
<tr>
<td>Correlation</td>
<td>0.571593</td>
<td>0.348729</td>
<td>0.733275</td>
<td>&lt;.0001*</td>
</tr>
<tr>
<td>Covariance</td>
<td>0.38458</td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Std Dev</th>
</tr>
</thead>
<tbody>
<tr>
<td>AVG Fin Confidence</td>
<td>6.12</td>
<td>1.014096</td>
</tr>
<tr>
<td>AVG FSE</td>
<td>2.683333</td>
<td>0.66347</td>
</tr>
</tbody>
</table>

#### Summary of Fit

- **RSquare**: 0.326719
- **RSquare Adj**: 0.312692
- **Root Mean Square Error**: 0.550044
- **Mean of Response**: 2.683333

#### Source

<table>
<thead>
<tr>
<th>Source</th>
<th>DF</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F Ratio</th>
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</thead>
<tbody>
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<td>Error</td>
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<td>14.522307</td>
<td>0.30255</td>
<td>Prob &gt; F</td>
</tr>
<tr>
<td>C. Total</td>
<td>49</td>
<td>21.569444</td>
<td>&lt;.0001*</td>
<td></td>
</tr>
</tbody>
</table>

#### Parameter Estimates

| Term             | Estimate | Std Error | t Ratio | Prob>|t| |
|------------------|----------|-----------|---------|-----|
| Intercept        | 0.394676 | 0.480549  | 0.82    | 0.4155 |
| AVG Fin Confidence| 0.3739637| 0.077485  | 4.83    | <.0001* |
To test the remaining three hypotheses, the proposed mediating effect of FSE on three different dependent variables' relationship with financial literacy, path analysis was performed using the R Studio software. This analysis consists of the following four steps: 1. Use a simple linear regression to measure the total effect of the independent variable (FL) on the dependent variable (will be done separately for all three of the dependent variables). 2. Use another simple linear regression to measure the effect of the independent variable (FL) on the mediator (FSE), which has already been completed for hypothesis one but will be repeated here using the R Studio software. 3. Final simple linear regression to measure the effect of the mediator on the dependent variable (will be done separately for all three of the dependent variables while controlling for the independent variable FL). 4. Run the causal mediation analysis that uses a quasi-Bayesian for confidence intervals. This will take the regression models we just generated and combine them to estimate the whole mediation.

Hypothesis 2 states that FSE mediates the relationship between FL and procurement of financial information/services beyond those required by statute or legislation. To test this, the previously mentioned four step process was run in the R Studio software. The calculated mediation is reported in Figure 3. Results from the first three steps are included as Figure A1 in the appendix and the summarized results from step four can be seen below in Table 4.

![Figure 3. Hypothesis 2 Results](image-url)
The effect of financial literacy on procurement of additional financial information/services does not appear to be mediated via financial self-efficacy. As Figure 3 above illustrates, the regression coefficient between financial literacy on procurement of additional financial information/services was significant, but the regression coefficient between FSE and additional financial information/services was not. The indirect effect was \((.13)(-.38) = -.05\). I tested the significance of this indirect effect using bootstrapping procedures. Unstandardized indirect effects were computed for each of 1,000 bootstrapped samples, and the 95% confidence interval was computed by determining the indirect effects at the 2.5th and 97.5th percentiles. The bootstrapped unstandardized indirect effect was -.05, and the 95% confidence interval ranged from -.28 to .13. Thus, the indirect effect was not statistically significant \((p=0.58)\). The test indicated that that Hypothesis 2 is not supported, possible explanations and ramifications of this are discussed below in the Conclusion section.

Hypothesis 3 states that FSE mediates the relationship between FL and use of financial information for decision making. To test this, the previously mentioned four step process was run in the R Studio software. The calculated mediation is reported in Figure 4. Results from the first three steps are included as Figure A1 in the appendix and the summarized results from step four can be seen below in Table 5.

### Table 4. Causal Mediation Analysis – Hypothesis 2

<table>
<thead>
<tr>
<th></th>
<th>Estimate 95%</th>
<th>CI Lower 95%</th>
<th>CI Upper</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACME</td>
<td>-0.050</td>
<td>-0.278</td>
<td>0.13</td>
<td>0.58</td>
</tr>
<tr>
<td>ADE</td>
<td>0.717</td>
<td>0.345</td>
<td>1.20</td>
<td>&lt;2e-16 ***</td>
</tr>
<tr>
<td>Total Effect</td>
<td>0.667</td>
<td>0.298</td>
<td>1.12</td>
<td>&lt;2e-16 ***</td>
</tr>
<tr>
<td>Prop. Mediated</td>
<td>-0.075</td>
<td>-0.601</td>
<td>0.20</td>
<td>0.58</td>
</tr>
</tbody>
</table>
The effect of financial literacy on the use of financial information for decision making does not appear to be mediated via financial self-efficacy. As Figure 4 above illustrates, the regression coefficient between financial literacy on the usage of financial information for decision making was significant but the regression coefficient between FSE and usage of financial information for decision making was not. The indirect effect was (.13)*(-.24) = -.03. I tested the significance of this indirect effect using bootstrapping procedures. Unstandardized indirect effects were computed for each of 1,000 bootstrapped samples, and the 95% confidence interval was computed by determining the indirect effects at the 2.5th and 97.5th percentiles. The bootstrapped unstandardized indirect effect was -.03, and the 95% confidence interval ranged from -.12 to .05. Thus, the indirect effect was not statistically significant (p=.40). The test indicated that
Hypothesis 3 is not supported, possible explanations and ramifications of this are discussed below in the Conclusion section.

Hypothesis 4 states that FSE mediates the relationship between FL and perceived financial performance. To test this, the previously mentioned four step process was run in the R Studio software. The calculated mediation is reported in Figure 5. Results from the first three steps are included as Figure A1 in the appendix and the summarized results from step four can be seen below in Table 6.

![Figure 5](image)

**Figure 5.** Hypothesis 4 Results

**Table 6.** Causal Mediation Analysis – Hypothesis 4

<table>
<thead>
<tr>
<th></th>
<th>Estimate 95%</th>
<th>CI Lower 95%</th>
<th>CI Upper</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACME</td>
<td>0.060</td>
<td>-0.021</td>
<td>0.17</td>
<td>0.23</td>
</tr>
<tr>
<td>ADE</td>
<td>0.110</td>
<td>-0.033</td>
<td>0.31</td>
<td>0.15</td>
</tr>
<tr>
<td>Total Effect</td>
<td>0.171</td>
<td>0.031</td>
<td>0.34</td>
<td>0.01**</td>
</tr>
<tr>
<td>Prop. Mediated</td>
<td>0.354</td>
<td>-0.302</td>
<td>1.53</td>
<td>0.23</td>
</tr>
</tbody>
</table>

The effect of financial literacy on perceived financial performance does not appear to be mediated via financial self-efficacy. As Figure 5 above illustrates, the regression coefficient between
financial literacy on the usage of financial information for decision making was significant but the regression coefficient between FSE and usage of financial information for decision making was not. The indirect effect was \((.13)\times(.46) = .06\). We tested the significance of this indirect effect using bootstrapping procedures. Unstandardized indirect effects were computed for each of 1,000 bootstrapped samples, and the 95% confidence interval was computed by determining the indirect effects at the 2.5th and 97.5th percentiles. The bootstrapped unstandardized indirect effect was .06, and the 95% confidence interval ranged from -.02 to .17. Thus, the indirect effect was not statistically significant \((p=.23)\). The test indicated that Hypothesis 4 is not supported, possible explanations and ramifications of this are discussed below in the Conclusion section.
CHAPTER V

CONCLUSION

In this section I will be addressing four major areas. First, the findings related to the hypotheses testing will be discussed. Second, a few limitations of the study are listed; for which, the reasoning for these limitations and possible future resolutions are also mentioned. Third, I proposed additional statistical comparisons, exploratory analysis technics, and ways of using some of the information already collected to investigate these topics further. Fourth, I discussed the contributions of this study and commented on its theoretical and practical implications.

5.1 Hypotheses Test Findings, Limitations, and Implications for Research, Practice, and Future Work

Strong support for Hypothesis 1 was indicated by the statistically significant effect of financial literacy on the financial self-efficacy variable. This support was strengthened by comparing five different possible measures of financial knowledge (three separate and two conglomerated measures) to the financial self-efficacy variable. In addition, significant and comparable results were found when using financial knowledge scores generated by testing the respondents’ knowledge in key areas, financial knowledge level was self-assessed (often referred to as financial confidence or perceived financial knowledge), and when financial knowledge was measured as a combination of the two. The General Financial Knowledge (GFK) Score was also found to be on the high side of moderately correlated (0.68) to the Perceived Financial Knowledge.
Hypothesis 2-4 did not have strong statistical support even though FL was found to have a significant impact on all three of the independent variables (Hypothesis 2: additional financial services, Hypothesis 3: Financial Information Use, and Hypothesis 4: Perceived Financial Performance). When analyzing all three of these hypotheses, the same issue arose when the linear regression of the independent variable and the mediator onto the dependent variable was performed, the resulting coefficient for the mediator became insignificant. In other words, the relationship between the mediator (financial self-efficacy) and the dependent variables vanished when the independent variable (Financial Literacy) was controlled. The existence of a relationship between FSE and the three dependent variables, when not controlling for Financial Literacy, was not tested as part of this study. This could be seen as a limitation of the study, but this direct connection was not theorized and could be an interesting area for future study. One possible reason for this could be the sample size. The sample size of 50 in this study meets the minimum threshold required for statistical significance; however, it falls short of the ideal size desired for a comprehensive analysis. While the data collected provides valuable insights, a larger sample size would have enhanced the robustness and generalizability of the findings.

The lack of significance in hypothesis two, three, and four may be attributed, in part, to the heterogeneity observed within the sample population. The presence of diverse characteristics and variables among participants could have introduced considerable variability, thereby diluting the effects under investigation. A larger sample size would allow for a more robust assessment of these factors, enabling the identification of underlying patterns and associations.

Furthermore, the small sample size restricted the ability to conduct subgroup analyses or slice the data based on specific criteria, such as employee number thresholds. Such segmentation could have facilitated a more nuanced examination of the phenomenon within more homogeneous subgroups, potentially revealing insights that were obscured in the broader analysis.
Therefore, while the current findings do not support the hypothesis, they underscore the need for caution in interpretation due to the constraints imposed by sample size and heterogeneity. Future research endeavors could address these limitations by employing larger sample sizes and implementing targeted subgroup analyses to elucidate the underlying dynamics more comprehensively.

To continue the topic of potential future study; it may also be interesting to run this full mediation analysis with the other potential measures of FL that were examined as part of Hypothesis 1 or even switch the positions of FL and FSE when testing for mediation, even though the current theoretical model proposed here is not configured in such a fashion. Additionally, the demographic information collected in the survey was not used in the preceding analysis, it was only reported as part of the sample characteristics and could create interesting results if included. Using this demographic information to create separate profiles may help explain some of entrepreneurial decision-making behaviors measured in this study. Specifically, does the financial literacy, financial self-efficacy, and decision-making behavior relationship differ based on demographic information (age, gender, education level, and industry of subject)? Additional work could also be performed to validate some of the newer measures proposed in this study, namely the items used to measure the concepts of Financial Literacy and Financial Self-Efficacy.

5.2 Contributions and Final Remarks

In this research study, I aimed to address four major objectives. First, I attempted to map out the current theoretical understanding of small business financial information use in the decision-making process, the tested and perceived knowledge of said decision makers, and its impact on comparative business performance. To achieve this, a literature review was performed in several areas, which also provides context for the four research questions being investigated. The literature review shows the current state of research concerning the
importance/performance/failure of small business, financial literacy, and the evolution of the
general self-efficacy measures toward a more subject matter focused measure known as financial
self-efficacy. This also required the creation and additional exploratory testing of the financial
self-efficacy variable determined to be more salient to small business decision makers. Second, a
theory-based framework of hypotheses was created to connect, extend, and enhance this avenue
of research. This contrasts with the theory lacking state of the current financial literacy literature.
Third, a survey was developed to collect relevant information, the survey was disseminated to an
appropriate population, and the resulting information was collected and analyzed to assess the
relationship between financial literacy, financial self-efficacy, and the importance of financial
information to small business decision makers. Fourth, I concluded by discussing the limitations
of this study and potential avenues for future study in this important but under examined part of
financial literacy literature. By completing these four objectives, I have helped expand the
understanding of both financial literacy and financial self-efficacy in small businesses.

These findings impact not just the practical implications (i.e. further training needs of small
business decision makers and possible impacts of financial self-efficacy on different business
activities) but they also have several theoretical implications. Even though there was no
mediation effect seen in this study, there was a theoretical connection established between many
of the variables that had not been previously measured in this combination, and many of these
relationships were found to be statistically significant. Prior research has already begun to assess
the connection between financial knowledge, confidence, and consumer financial behaviors
(Asaad, 2015), which paralleled the aspirations of this study (just with small business financial
behaviors as the aim), and until now no similar study exists making the connection between
financial knowledge and small-business decision making behaviors. Three of the five financial
knowledge questions (number 1, 2, and 5 from Table A1 in the appendix) are derived from a
standard set of financial literacy questions used in many other surveys (Lusardi & Mitchell,
2014), and this three question assessment is possibly the closest to a generally accepted measure of financial literacy that we have today. I added additional measures for financial knowledge and examined their relationship with one another as well as several other variables. Including two additional question (number 3 concerning bonds and number 4 concerning mortgages) increased the length beyond the standard three used in other studies but increases the ability of our instrument to assess the participants’ ability to understand more complex specific financial instruments commonly used. The financial confidence, or perceived knowledge, component in this study was included due to the recent finding showing a connection between financial knowledge, perceived knowledge, financial satisfaction, financial behaviors, risk aversion, sociodemographic variables, and advice seeking (Asaad, 2015; Robb, Babiarz, & Woodyard, 2012). This study's findings mirror many of those found in the personal finance literature while moving their implications to the small business arena. Hopefully, this study will serve to help increase the vigor of future research into the field of small business decision making and the impact of financial literacy and self-efficacy.
REFERENCES


### Table A1. Financial Knowledge - General and Small Business Financial Literacy Measures

<table>
<thead>
<tr>
<th>Items</th>
<th>Item Difficulty</th>
<th>Item total-correlation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Suppose you had $100 in a savings account and the interest rate was 2% per year. After 5 years, how much do you think you would have in the account if you left the money to grow? More than $102; Exactly $102; Less than $102; Don’t know</td>
<td>0.92</td>
<td>0.56</td>
</tr>
<tr>
<td>2. Imagine that the interest rate on your savings account was 1% per year and inflation was 2% per year. After 1 year, how much would you be able to buy with the money in this account? More than today; Exactly the same; Less than today; Don’t know</td>
<td>0.90</td>
<td>0.83</td>
</tr>
<tr>
<td>3. If interest rates rise, what will typically happen to bond prices? They will rise; They will fall; They will stay the same; There is no relationship; Don’t know</td>
<td>0.68</td>
<td>0.54</td>
</tr>
<tr>
<td>4. A 15-year mortgage typically requires higher monthly payments than a 30-year mortgage, but the total interest paid over the life of the loan will be less. True; False; Don’t know</td>
<td>0.96</td>
<td>0.74</td>
</tr>
<tr>
<td>5. Buying a single company’s stock usually provides a safer return than a stock mutual fund. True; False; Don’t know</td>
<td>0.88</td>
<td>0.70</td>
</tr>
<tr>
<td>6. Why is “return on assets” (ROA) so important? Accurately projects cash flow needs; Indicates how efficiently management is using assets to generate earnings; Indicates the differences between asset and liability impact on financial performance; Management must use it to assess the liquidity of the business</td>
<td>0.80</td>
<td>0.70</td>
</tr>
<tr>
<td>7. Pick the definition of “free cash flow”. Indicates projected future cash surplus or shortage; Receivables and payables cleared at the end of each period; The cash available to your business after expenses, including capital expenditures</td>
<td>0.82</td>
<td>0.46</td>
</tr>
<tr>
<td>8. Gross profit is: The same thing as overall profit; The difference between revenues earned and expenses incurred; The difference between costs directly associated with acquiring and selling products; The difference between cash received and cash distributed</td>
<td>0.52</td>
<td>0.52</td>
</tr>
</tbody>
</table>

Table A1 continues on the following page.
9. How can short-term cash-flow be improved? Require deposits on large/custom orders; Offer discounts for quick payment; All of the above

<table>
<thead>
<tr>
<th>Item</th>
<th>Item Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>0.92</td>
</tr>
<tr>
<td></td>
<td>0.22</td>
</tr>
</tbody>
</table>

10. When making a sale on account (no payment was received), revenues increase and so do _______. Accounts receivable; Long-term assets; Operating cash; Short-term liabilities

<table>
<thead>
<tr>
<th>Item</th>
<th>Item Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>0.86</td>
</tr>
<tr>
<td></td>
<td>0.49</td>
</tr>
</tbody>
</table>

Financial knowledge (as assessed on consumers in the NFCS) was comprised of five key areas: 1. Interest, 2. Inflation, 3. Bonds, 4. Mortgages, and 5. Risk. These five areas were measured with one question, per area, with one correct answer (provided below in italics). Number 1, 2, and 5 are derived from the standard financial literacy measuring just those three domains, previously developed and validated by Lusardi and Mitchell (Lusardi & Mitchell, 2006; Lusardi & Mitchell, 2014). Five new key areas were measured for this study: 6. Return on Assets (ROA), 7. Free Cash Flow, 8. Gross Profit, 9. Cash Budgeting, and 10. Accruals. When the italicized answers are given, they are coded as correct (or 1), and all other responses are coded as not correct (or 0). “Prefer not to say” was an additional option included on all questions. Item difficulty is the percentage of respondents answering this item correctly, while the item total-correlation is the correlation between respondents’ item score and their total correct percentage for all 10 items.

Table A2. Financial Confidences

<table>
<thead>
<tr>
<th>Items</th>
<th>Item Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Overall – “On a scale from 1 to 7, where 1 means very low and 7 means very high, how would you assess your overall financial knowledge?”</td>
<td>5.5</td>
</tr>
<tr>
<td>On the following 2 questions “how strongly do you agree or disagree with the following statements?”</td>
<td></td>
</tr>
<tr>
<td>2. Day-to-Day - “I am good at dealing with day-to-day financial matters, such as checking accounts, credit and debit cards, and tracking expenses.”</td>
<td>6.38</td>
</tr>
<tr>
<td>3. Math - “I am pretty good at math.”</td>
<td>6.48</td>
</tr>
</tbody>
</table>

Financial confidence measure adopted from the NFCS consisted of three questions. Participants rated themselves on their self-assessed knowledge using a 7-point Likert where a “1” reflects low levels or strongly disagree, “4” reflects average levels or neither agree/disagree, and a “7” reflects high levels or strongly agree. Question 1 and 2 specifically relate to perceived financial knowledge and its use, while question 3 focuses on math ability.
Table A3. Financial Self-Efficacy

<table>
<thead>
<tr>
<th>Items</th>
<th>Item Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Please respond to the following statements using these response categories: 1 = Exactly true 2 = Moderately true 3 = Hardly true 4 = Not at all true</td>
<td></td>
</tr>
<tr>
<td>1. It is hard to stick to my spending plan when unexpected expenses arise.</td>
<td>2.18</td>
</tr>
<tr>
<td>2. It is challenging to make progress toward my financial goals.</td>
<td>2.24</td>
</tr>
<tr>
<td>3. When unexpected expenses occur, I usually have to use credit.</td>
<td>2.88</td>
</tr>
<tr>
<td>4. When faced with a financial challenge, I have a hard time figuring out a solution.</td>
<td>3.12</td>
</tr>
<tr>
<td>5. I lack confidence in my ability to manage my finances.</td>
<td>3.08</td>
</tr>
<tr>
<td>6. I worry about running out of money in retirement.</td>
<td>2.60</td>
</tr>
</tbody>
</table>

Another notable FSE measurement tool used by other researchers was a similar five item scale developed by Montford and Goldsmith (2016), but was more heavily oriented toward personal investment decisions (Montford & Goldsmith, 2016; Tang et al., 2019).
Table A4. Financial Decision-making behavior.

<table>
<thead>
<tr>
<th>Items</th>
<th>Item Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial Information Preparation/Use:</td>
<td></td>
</tr>
<tr>
<td>1. Are monthly company financial statements (income statement and balance sheet) prepared?</td>
<td>0.70</td>
</tr>
<tr>
<td>2. Do you review monthly financial statements?</td>
<td>0.74</td>
</tr>
<tr>
<td>3. Do you perform financial analysis on monthly financial statements?</td>
<td>0.54</td>
</tr>
<tr>
<td>4. Do you understand the use of the company’s gross profit ratio and how it differs from overall profit?</td>
<td>0.72</td>
</tr>
</tbody>
</table>

This is the average number of affirmative responses to the 4 items above. A 0 would indicate no participants used/had/understood the information while a 4 would indicate all participants used/had/understood the information.

2.7

Additional financial information/services availability:

The following set up was used to judge the type of information available to the participant using a 7-point Likert where a “1” reflects strongly disagree, “4” reflects neither agree/disagree, and a “7” reflects strongly agree:

If only three different types of information exist: 1. Statutory – required by legislation or government authority, such as those required by taxation authorities like the IRS. 2. Budgetary – financial plan that makes use of future period incomes and expenses estimates. 3. Additional – is a blanket description for any accounting information obtained beyond those deemed statutory or budgetary. Describes the information you have available concerning your business.

| 1. Statutory | 5.8 |
| 2. Budgetary | 5.4 |
| 3. Additional Information | 5.2 |
Figure A1. – Coding and Results from R Studio Software

R version 4.1.0 (2021-05-18) -- "Camp Pontanezen"
Copyright (C) 2021 The R Foundation for Statistical Computing
Platform: x86_64-w64-mingw32/x64 (64-bit)

R is free software and comes with ABSOLUTELY NO WARRANTY.
You are welcome to redistribute it under certain conditions.
Type 'license()' or 'licence()' for distribution details.

R is a collaborative project with many contributors.
Type 'contributors()' for more information and
'citation()' on how to cite R or R packages in publications.

Type 'demo()' for some demos, 'help()' for on-line help, or
'help.start()' for an HTML browser interface to help.
Type 'q()' to quit R.

[Workspace loaded from ~/.RData]

> library(readxl)
Warning message:
package 'readxl' was built under R version 4.1.3
> library(writexl)
Warning message:
package 'writexl' was built under R version 4.1.3
> library(mediation)
Loading required package: MASS
Loading required package: Matrix
Loading required package: mvtnorm
Loading required package: sandwich
mediation: Causal Mediation Analysis
Version: 4.5.0

Warning messages:
1: package 'mediation' was built under R version 4.1.1
2: package 'mvtnorm' was built under R version 4.1.1
3: package 'sandwich' was built under R version 4.1.3

> #######
> # Load Data
> Dissertation_Data_Clean <- read_excel("Dissertation_Data_Clean.xlsx")
> # View(Dissertation_Data_Clean)
>
> print (Dissertation_Data_Clean)
# A tibble: 75 x 81
#  Start_Date          End_Date            Response_Type  Progress Dura-
#   <dttm>             <dttm>             <chr>          <dbl>   <
#   1 2020-02-24 01:11:00 2020-02-24 01:13:00 Survey Preview      100
#   2 2020-02-25 15:05:00 2020-02-25 15:05:00 Survey Test         100
#   3 2020-02-25 15:05:00 2020-02-25 15:05:00 Survey Test         100
#   4 2020-02-25 15:05:00 2020-02-25 15:05:00 Survey Test         100
#   5 2020-02-25 15:05:00 2020-02-25 15:05:00 Survey Test         100
#   6 2020-02-25 15:05:00 2020-02-25 15:05:00 Survey Test         100
#   7 2020-02-25 15:13:00 2020-02-25 15:19:00 IP Address           100
#   353 TRUE
# Clean Data
> df = subset(Dissertation_Data_Clean,
+   Dissertation_Data_Clean$Agree_to_participate == 'I Agree'
+   & !is.na(Dissertation_Data_Clean$FSE_1)
+   & Dissertation_Data_Clean$Distribution_Channel == 'anonymous'
+   & !is.na(Dissertation_Data_Clean$BFK_Score_N)
+   & Dissertation_Data_Clean$Age != '85 or older'
+ )

# fix one unanswered question
> df$BFK_1_N[is.na(df$BFK_1_N)] <- 0

# Calculate Scores
> # SFK
> df$SFK_Score = (df$SFK_Overall_N + df$SFK_Day2Day_N + df$SFK_Math_N) / 3
> # SFK Z Score
> df$SFK_Z_Score = (df$SFK_Score-mean(df$SFK_Score))/sd(df$SFK_Score)
> # GFK
> df$GFK_Score = df$GFK_1_N + df$GFK_2_N + df$GFK_3_N + df$GFK_4_N + df$GFK_5_N
> # BFK
> df$BFK_Score = df$BFK_1_N + df$BFK_2_N + df$BFK_3_N + df$BFK_4_N + df$BFK_5_N
> # Additional Information
> df$AI_Score <- df$AI_1_N + df$AI_2_N + df$AI_3_N
> # Financial Literacy
> df$FL_Score <- df$SFK_Score + df$GFK_Score + df$BFK_Score
> # Financial self-efficacy
> df$FSE_Score <- df$FSE_Mean_N
> # Info availability & use
```r
# Percieved Financial Performance
df$PFP_Score <- df$Est_Prof_N

# Export data
write_xlsx(df,"df_out.xlsx")

# H1 - direct effect of FK on FSE

# GFK
H1_GFK_model <- glm(FSE_Mean_N ~ GFK_Score_N, data = df)
summary(H1_GFK_model)

Call: glm(formula = FSE_Mean_N ~ GFK_Score_N, data = df)

Deviance Residuals:
       Min         1Q     Median         3Q        Max
-1.69640   -0.33666   -0.02974    0.30360    1.24259

Coefficients:                  Estimate Std. Error t value Pr(>|t|)
(Intercept)          1.50142    0.33439   4.490  4.46e-05 ***
GFK_Score_N          0.27233    0.07458   3.651  0.000644 ***
---                  Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

(Dispersion parameter for gaussian family taken to be 0.3516842)

Null deviance: 21.569  on 49  degrees of freedom
Residual deviance: 16.881  on 48  degrees of freedom
AIC: 93.602

Number of Fisher Scoring iterations: 2

# BFK
H1_BFK_model <- glm(FSE_Mean_N ~ BFK_Score_N, data = df)
summary(H1_BFK_model)

Call: glm(formula = FSE_Mean_N ~ BFK_Score_N, data = df)

Deviance Residuals:
       Min         1Q     Median         3Q        Max
-1.54023   -0.37356   -0.02863    0.33301    1.36196

Coefficients:                  Estimate Std. Error t value Pr(>|t|)
(Intercept)          1.76481    0.35342   4.994  8.6e-06 ***
BFK_Score_N          0.23552    0.08639   2.726  0.00898 **
---                  Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

(Dispersion parameter for gaussian family taken to be 0.3875115)

Null deviance: 21.093  on 48  degrees of freedom
Residual deviance: 18.213  on 47  degrees of freedom
(1 observation deleted due to missingness)
AIC: 96.562
```
Number of Fisher Scoring iterations: 2

> # Overall FL
> H1_FL_model <- glm(AI_Score ~ FL_Score, data = df)
> summary(H1_FL_model)

Call:
glm(formula = AI_Score ~ FL_Score, data = df)

Deviance Residuals:
  Min       1Q   Median       3Q      Max
-9.1618  -1.2699   0.5066   1.8397   5.1750

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)   6.8167     2.2875   2.980  0.00451 **
FL_Score      0.6674     0.1564   4.267 9.27e-05 ***
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

(Dispersion parameter for gaussian family taken to be 9.424976)

    Null deviance: 624.0  on 49  degrees of freedom
Residual deviance: 452.4  on 48  degrees of freedom
AIC: 258.02

Number of Fisher Scoring iterations: 2

> # H2 - test of mediation of FSE on Additional Information

> # Step 1 - Total effect
> H2_model.totaleffect <- glm(AI_Score ~ FL_Score, data = df)
> summary(H2_model.totaleffect)

Call:
glm(formula = AI_Score ~ FL_Score, data = df)

Deviance Residuals:
  Min       1Q   Median       3Q      Max
-9.1618  -1.2699   0.5066   1.8397   5.1750

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)   6.8167     2.2875   2.980  0.00451 **
FL_Score      0.6674     0.1564   4.267 9.27e-05 ***
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

(Dispersion parameter for gaussian family taken to be 9.424976)

    Null deviance: 624.0  on 49  degrees of freedom
Residual deviance: 452.4  on 48  degrees of freedom
AIC: 258.02

Number of Fisher Scoring iterations: 2

> # Step 2 - Effect of IV on mediator
> H2_model.mediator <- glm(FSE_Score ~ FL_Score, data = df)
> summary(H2_model.mediator)
Call:
glm(formula = FSE_Score ~ FL_Score, data = df)

Deviance Residuals:
Min       1Q     Median       3Q      Max
-1.38261  -0.25230  -0.01318   0.34060   1.19701

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)   0.80824    0.41653   1.940   0.0582 .
FL_Score     0.13058    0.02848   4.585 3.26e-05 ***
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

(Dispersion parameter for gaussian family taken to be 0.3124992)
	null deviance: 21.569 on 49 degrees of freedom
  residual deviance: 15.000 on 48 degrees of freedom
  AIC: 87.695

Number of Fisher Scoring iterations: 2

> # Step 3 - Effect of mediator on DV controlling for IV
> H2_model.dv <- glm(AI_Score ~ FL_Score + FSE_Score, data = df)
> # With interaction
> # H2_model.dv <- glm(AI_Score ~ FL_Score + FSE_Score + FL_Score * FSE_Score, data = df)
> summary(H2_model.dv)

Call:
glm(formula = AI_Score ~ FL_Score + FSE_Score, data = df)

Deviance Residuals:
Min       1Q     Median       3Q      Max
-9.109  -1.318   0.441   2.115   5.095

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)   7.1261     2.3948   2.976 0.004607 **
FL_Score      0.7174     0.1891   3.794 0.000423 ***
FSE_Score    -0.3828     0.7991  -0.479 0.634113
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

(Dispersion parameter for gaussian family taken to be 9.578733)
	null deviance: 624.0 on 49 degrees of freedom
  residual deviance: 450.2 on 47 degrees of freedom
  AIC: 259.78

Number of Fisher Scoring iterations: 2

> # Step 4 - Causal mediation analysis
> H2_results = mediate( H2_model.mediator,
+                      H2_model.dv,
+                      treat = 'FL_Score',
+                      mediator = 'FSE_Score',
+                      # robustSE = T,
+                      boot = T
+                    )

Running nonparametric bootstrap
> summary(H2_results)

Causal Mediation Analysis

Nonparametric Bootstrap Confidence Intervals with the Percentile Method

<table>
<thead>
<tr>
<th></th>
<th>Estimate</th>
<th>95% CI Lower</th>
<th>95% CI Upper</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACME</td>
<td>-0.0500</td>
<td>-0.2776</td>
<td>0.13</td>
<td>0.58</td>
</tr>
<tr>
<td>ADE</td>
<td>0.7174</td>
<td>0.3452</td>
<td>1.20</td>
<td>&lt;2e-16 ***</td>
</tr>
<tr>
<td>Total Effect</td>
<td>0.6674</td>
<td>0.2980</td>
<td>1.12</td>
<td>&lt;2e-16 ***</td>
</tr>
<tr>
<td>Prop. Mediated</td>
<td>-0.0749</td>
<td>-0.6013</td>
<td>0.20</td>
<td>0.58</td>
</tr>
</tbody>
</table>

---

Signif. codes: 0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 1

Sample Size Used: 50
Simulations: 1000

> plot(H2_results, main="H2 Mediation Test")

> # To test with interaction
> # test.TMint(H2_results, conf.level = .95)

> #######
> # H3 - test of mediation of FSE on FIU
> # Step 1 - Total effect
> H3_model.totaleffect <- glm(IAU_Score ~ FL_Score, data = df)
> summary(H3_model.totaleffect)

Call:  
glm(formula = IAU_Score ~ FL_Score, data = df)

Deviance Residuals:
  Min       1Q   Median       3Q      Max
-3.0529  -0.9629   0.4422   0.9471   1.6673

Coefficients:
        Estimate Std. Error t value Pr(>|t|)
(Intercept)  -1.1786    0.9762   -1.207 0.233255
FL_Score     0.2701    0.0668    4.047 0.000188 ***

(Dispersion parameter for gaussian family taken to be 1.716504)

Null deviance: 110.500  on 49  degrees of freedom
Residual deviance:  82.392  on 48  degrees of freedom
AIC: 172.87

Number of Fisher Scoring iterations: 2

> # Step 2 - Effect of IV on mediator
> H3_model.mediator <- glm(FSE_Score ~ FL_Score, data = df)
> summary(H3_model.mediator)

Call:  
glm(formula = FSE_Score ~ FL_Score, data = df)

Deviance Residuals:
  Min      1Q  Median      3Q     Max
-1.3826  -0.2523  0.0131  0.3406  1.1970

Coefficients:  
        Estimate Std. Error t value Pr(>|t|)
(Intercept)  -1.5089    0.5536  -2.727   0.0106 *
FL_Score     0.2260    0.0567   4.008 3.47e-04 ***

(Dispersion parameter for gaussian family taken to be 1.19701)

Null deviance: 228.504 on 49 degrees of freedom
Residual deviance: 185.787 on 48 degrees of freedom
AIC: 103.79

Number of Fisher Scoring iterations: 2
Coefficients:

| Estimate | Std. Error | t value | Pr(>|t|) |
|----------|------------|---------|----------|
| (Intercept) | 0.80824 | 0.41653 | 1.940 | 0.0582 |
| FL_Score | 0.13058 | 0.02848 | 4.585 | 3.26e-05 *** |

---

Signif. codes: 0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

(Dispersion parameter for gaussian family taken to be 0.3124992)

Null deviance: 21.569 on 49 degrees of freedom
Residual deviance: 15.000 on 48 degrees of freedom
AIC: 87.695

Number of Fisher Scoring iterations: 2

> # Step 3 - Effect of mediator on DV controlling for IV
> H3_model.dv <- glm(IAU_Score ~ FL_Score + FSE_Score, data = df)
> summary(H3_model.dv)

Call:
glm(formula = IAU_Score ~ FL_Score + FSE_Score, data = df)

Deviance Residuals:
Min       1Q   Median       3Q      Max
-3.0580  -0.9837   0.3877   0.9713   1.6903

Coefficients:

| Estimate | Std. Error | t value | Pr(>|t|) |
|----------|------------|---------|----------|
| (Intercept) | -0.98069 | 1.01890 | -0.962 | 0.340727 |
| FL_Score | 0.30206 | 0.08044 | 3.755 | 0.000477 *** |
| FSE_Score | -0.24481 | 0.33999 | -0.720 | 0.475069 |

---

Signif. codes: 0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

(Dispersion parameter for gaussian family taken to be 1.733899)

Null deviance: 110.500 on 49 degrees of freedom
Residual deviance: 81.493 on 47 degrees of freedom
AIC: 174.32

Number of Fisher Scoring iterations: 2

> # Step 4 - Causal mediation analysis
> H3_results = mediate( H3_model.mediator,
> + H3_model.dv,
> + treat = 'FL_Score',
> + mediator = 'FSE_Score',
> + # robustSE = T,
> + boot = T
> + )

Running nonparametric bootstrap

> summary(H3_results)

Causal Mediation Analysis

Nonparametric Bootstrap Confidence Intervals with the Percentile Method

<table>
<thead>
<tr>
<th>Estimate</th>
<th>95% CI Lower</th>
<th>95% CI Upper</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACME</td>
<td>-0.032</td>
<td>-0.117</td>
<td>0.05</td>
</tr>
</tbody>
</table>
Sample Size Used: 50
Simulations: 1000

> plot(H3_results, main="H3 Mediation Test")

###

# H4 - test of mediation of FSE on PFP

> # Step 1 - Total effect
> H4_model.totaleffect <- glm(PFP_Score ~ FL_Score, data = df)
> summary(H4_model.totaleffect)

Call:  
glm(formula = PFP_Score ~ FL_Score, data = df)

Deviance Residuals:    
Min       1Q   Median       3Q      Max
-3.1555  -0.5254  -0.1270   0.7165   2.7876

Coefficients:    
Estimate Std. Error  t value Pr(>|t|)
(Intercept)  1.7081     1.0399   1.643   0.1070
FL_Score      0.1707     0.0711   2.402   0.0202 *

(Dispersion parameter for gaussian family taken to be 1.947655)

Null deviance: 104.720 on 49 degrees of freedom  
Residual deviance:  93.487 on 48 degrees of freedom
AIC: 179.18

Number of Fisher Scoring iterations: 2

> # Step 2 - Effect of IV on mediator
> H4_model.mediator <- glm(FSE_Score ~ FL_Score, data = df)
> summary(H4_model.mediator)

Call:  
glm(formula = FSE_Score ~ FL_Score, data = df)

Deviance Residuals:    
Min        1Q    Median        3Q       Max
-1.38261  -0.25230  -0.01318   0.34060   1.19701

Coefficients:    
Estimate Std. Error  t value Pr(>|t|)
(Intercept)  0.80824    0.41653   1.940   0.0582 .
FL_Score     0.13058    0.02848   4.585 3.26e-05 ***

(Dispersion parameter for gaussian family taken to be 0.3124992)

Null deviance: 21.569 on 49 degrees of freedom  
Residual deviance: 15.000 on 48 degrees of freedom
AIC: 87.695

Number of Fisher Scoring iterations: 2

> # Step 3 - Effect of mediator on DV controlling for IV
> H4_model.dv <- glm(PFP_Score ~ FL_Score + FSE_Score, data = df)
> summary(H4_model.dv)

Call:  
  glm(formula = PFP_Score ~ FL_Score + FSE_Score, data = df)

Deviance Residuals:
   Min       1Q   Median       3Q      Max
  -3.3808  -0.5196  -0.0189   0.8332   2.5053

Coefficients:  
             Estimate Std. Error t value Pr(>|t|)
(Intercept)  1.33402    1.07239   1.244    0.220
FL_Score     0.11030    0.08467   1.303    0.199
FSE_Score    0.46287    0.35784   1.294    0.202

(Dispersion parameter for gaussian family taken to be 1.920716)

    Null deviance: 104.720  on 49  degrees of freedom
    Residual deviance:  90.274  on 47  degrees of freedom
    AIC: 179.43

Number of Fisher Scoring iterations: 2

> # Step 4 - Causal mediation analysis
> H4_results = mediate( H4_model.mediator,  
>                       H4_model.dv,  
>                       treat = 'FL_Score',  
>                       mediator = 'FSE_Score',  
>                       # robustSE = T,  
>                       boot = T  
> )

Running nonparametric bootstrap

> summary(H4_results)
Causal Mediation Analysis

Nonparametric Bootstrap Confidence Intervals with the Percentile Method

       Estimate  95% CI Lower 95% CI Upper  p-value
   ACME    0.0604  -0.0305   0.17     0.23
   ADE     0.1103  -0.0326   0.31     0.15
Total Effect  0.1707  0.0313   0.34     0.01 **
Prop. Mediated 0.3540  -0.3015  1.53     0.23

---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Sample Size Used: 50
Simulations: 1000

> plot(H4_results, main="H4 Mediation Test")
The above figure consists of all the code used in R Studio used when testing hypotheses 2-4. The part that is referenced in the hypothesis analysis consists of the following four steps and the results are above: 1. Use a simple linear regression to measure the total effect of the independent variable (FL) on the dependent variable (will be done separately for all three of the dependent variables). 2. Use another simple linear regression to measure the effect of the independent variable (FL) on the mediator (FSE), which has already been completed for hypothesis one but will be repeated here using the R Studio software. 3. Final simple linear regression to measure the effect of the mediator on the dependent variable (will be done separately for all three of the dependent variables while controlling for the independent variable FL). The results of step 4 were provided in figure 3, 4, and 5 in their corresponding hypothesis analysis section.
Figure A2. – IRB Approval Letter

Oklahoma State University Institutional Review Board

Date: 02/18/2020
Application Number: IRB-20-92
Proposal Title: IMPACT OF FINANCIAL SELF-EFFICACY AND FINANCIAL LITERACY ON SMALL BUSINESS DECISION MAKING BEHAVIORS AND PERFORMANCE PERCEPTION

Principal Investigator: Sam Bass
Co-Investigator(s): 
Faculty Adviser: DURSUN DELEN
Project Coordinator: 
Research Assistant(s): 

Processed as: Exempt
Exempt Category:

Status Recommended by Reviewer(s): Approved

The IRB application referenced above has been approved. It is the judgment of the reviewers that the rights and welfare of individuals who may be asked to participate in this study will be respected, and that the research will be conducted in a manner consistent with the IRB requirements as outlined in 45CFR46.

This study meets criteria in the Revised Common Rule, as well as, one or more of the circumstances for which continuing review is not required. As Principal Investigator of this research, you will be required to submit a status report to the IRB triennially.

The final versions of any recruitment, consent and assent documents bearing the IRB approval stamp are available for download from IRBManager. These are the versions that must be used during the study.

As Principal Investigator, it is your responsibility to do the following:
1. Conduct this study exactly as it has been approved. Any modifications to the research protocol must be approved by the IRB. Protocol modifications requiring approval may include changes to the title, PI, advisor, other research personnel, funding status or sponsor, subject population composition or size, recruitment, inclusion/exclusion criteria, research site, research procedures and consent/assent process or forms.
2. Submit a request for continuation if the study extends beyond the approval period. This continuation must receive IRB review and approval before the research can continue.
3. Report any unanticipated and/or adverse events to the IRB Office promptly.
4. Notify the IRB office when your research project is complete or when you are no longer affiliated with Oklahoma State University.

Please note that approved protocols are subject to monitoring by the IRB and that the IRB office has the authority to inspect research records associated with this protocol at any time. If you have questions about the IRB procedures or need any assistance from the Board, please contact the IRB Office at 405-744-3377 or irb@okstate.edu.

Sincerely,
Oklahoma State University IRB
PARTICIPANT INFORMATION FORM


You are invited to be in a research study of small business decision makers’ financial knowledge, beliefs, and behaviors conducted by Samuel Bass, Spears School of Business, Oklahoma State University, under the direction of Dr. Dursun Delen. You were selected as a possible participant because of your connection to the small business community and the Small Business Development Center. We ask that you read this form and ask any questions you may have before agreeing to be in the study. Your participation is entirely voluntary. There is no penalty for refusal to participate, and you are free to withdraw your consent and participation in the project at any time.

If you agree to be in this study, I ask you to do the following: Complete an online survey that will take less than 30 minutes of your time.

Compensation: You will receive no payment for participating in this study.

Confidentiality: The information you give in the study will be anonymous. This means that your name will not be collected or linked to the data in any way. The researchers will not be able to remove your data from the dataset once your participation is complete. This data will be stored in a password protected computer indefinitely. The research team will ensure anonymity to the degree permitted by technology. Your participation in this online survey involves risks similar to a person’s everyday use of the internet. If you have concerns, you should consult the survey provider privacy policy at https://www.qualtrics.com/privacy-statement/.

Contacts and Questions: If you have questions about the research study itself, please contact the Principal Investigator at 417-766-4593, Sam.Bass@okstate.edu. If you have questions about your rights as a research volunteer, please contact the OSU IRB at (405) 744-3377 or irb@okstate.edu.

If you agree to participate in this research, please click “I Agree” to continue.
VITA

Samuel James Bass

Candidate for the Degree of

Doctor of Philosophy

Dissertation: IMPACT OF FINANCIAL SELF-EFFICACY AND FINANCIAL LITERACY ON SMALL-BUSINESS DECISION MAKING BEHAVIORS AND PERFORMANCE PERCEPTION

Major Field: Business Administration

Biographical:

Education:

Completed the requirements for the Doctor of Philosophy in Business Administration at Oklahoma State University, Stillwater, Oklahoma in May, 2024.

Completed the requirements for the Master of Accountancy at Missouri State University, Springfield, Missouri in 2006.

Completed the requirements for the Bachelor of Science in Accounting at Southwest Missouri State University, Springfield, Missouri in 2004.

Experience:

Missouri State University – Springfield campus August 2008 – May 2023
B & B Rentals and Real Estate – Springfield area May 2003 – March 2018
Ernst & Young – St. Louis, MO July 2006 – July 2007

Professional Memberships:
Missouri Association of Accounting Educators (MAAE)
Institute of Management Accountants (IMA)