

Financial literacy in Israel: The impact of sector and region on financial literacy

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Abstract. This study analysed the impact of the sector (being Jewish or Arab) and the region on financial literacy in Israel. First, the goal was to map the factors affecting financial literacy in Israel. Using data from the “Financial Literacy Survey in Israel”, some of the variables that affect financial literacy in Israel were identified; Gender, occupation, education, number of household dependents, age, sector and region. After mapping the factors affecting financial literacy in Israel, it was found that the effect on financial literacy of each of the variables region and sector, was not significant. It was proposed to examine whether the combination of both has a greater impact on financial literacy in Israel. A financial literacy index, based on the number of correct responses to six multiple choice questions, was used to research the relevance and impact of the sector and the region on financial literacy. Sector was found to mediate the effect of region on financial literacy and region had a similar effect in mediating between the sector and financial literacy in Israel. The results indicated significant differences, and the interaction between the two independent variables, Sector – Region, made their impact on financial literacy unambiguously significant.

Keywords: financial literacy, financial literacy index, multiple linear regressions.
JEL Codes: A20, D14, G11, I20, J26.

Introduction

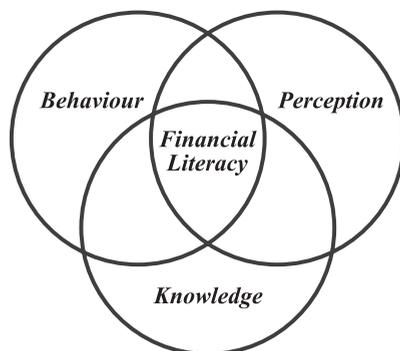
Financial literacy is the ability to learn and understand basic economic concepts and analyze economic information. Individuals are considered financially literate if they are competent and can demonstrate the ability to communicate about financial knowledge and have used the economic principles which they have learned. Financial literacy includes the ability to evaluate economic possibilities, skill in making appropriate financial decisions and make sensible saving and investment decisions that influence the economic welfare of an individual. A financially literate individual can make informed judgments and effective decisions regarding the use

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and management of money that would be in his or her own best long-run interests. In order to be considered a financially literate individual, a person should have confidence in planning effectively for future financial needs, to act in accordance with this plan in the present, and to react in an educated way to economic changes that influence the economic welfare of that individual [Hung, Parker, Yoong 2009; Huston 2010; Remund 2010].

The concept of financial literacy demonstrates the value of notion “*The whole is greater than the sum of its parts*”. It combines three components from three main content areas: knowledge, perception (opinions) and behavioural skills. Each of these areas is an important part of the individual’s ability to make well-informed financial decisions in developed global financial markets, but the integration of these three channels and their effectiveness far exceeds the sum of all operations in each channel separately.

Diagram 1. Financial literacy - three main aspects



Source: Author’s own elaboration.

Note: Co-operation in the three content channels brings effective financial decisions, maximizes the individual’s utility and gives the best financial results for the individual at every stage of his life cycle.

In recent years, it has been recognised that financial literacy should be viewed as human capital [Lusardi 2015]. It should be acknowledged as an essential skill for participation in today’s economy and one of the most important core abilities to be developed by individuals operating in emerging global financial markets [Lusardi, Mitchell 2014]. Financial literacy constitutes a “financial capacity” for a well-being [Atkinson, Messy 2012].

2. The importance of financial literacy

Studies around the world have shown that high financial literacy in individuals is associated with more informed decision making [Lusardi, Mitchell 2014] and better results on issues of financial planning, debt [Lusardi, Tufano 2009b; Disney, Gathergood 2013], wealth accumulation, and pensions [Lusardi, Mitchell 2005,

2006, 2007, 2011; Lusardi, Tufano 2009b; Van Rooij, Lusardi, Alessie 2009, 2011; Yoong 2011; Behrman et al. 2012]. Financial literacy is positively associated with participation in financial markets [Van Rooij, Lusardi, Alessie 2011; Yoong 2011; Jappelli, Padula 2013] and is negatively related to the use of informal recruitment sources. Studies suggest that financial literacy may better equip individuals to deal with macroeconomic crises [Klapper, Lusardi, Panos 2013]. Arguably most research that has been conducted has found that the financially savvy are more likely to plan and to succeed in their planning, and they rely on formal methods such as retirement calculators, retirement seminars, and financial experts, instead of family/relatives or co-workers [Lusardi, Mitchell 2011a].

The increasing relevance of financial literacy becomes even more evident when discussing the rapid development of global markets. In a more risky and global marketplace, people must be able to make sound financial decisions [Lusardi, Washington, Mitchell 2011]. The results show that financial illiteracy is widespread when financial markets are well-developed or rapidly changing [Lusardi, Washington, Mitchell 2011; Nicolini, Cude, Chatterjee 2013; Mitchell, Lusardi 2015]. The accelerated development of global markets is raising serious concerns about the financial security of individuals, especially those who lack the skills and resources to withstand the rapidly developing financial capital markets. Conclusions can be drawn about the effects and implications of financial illiteracy, and what is effective in correcting these problems [Jappelli, Padula 2013].

Financial literacy is seen as important and something to be encouraged among those who do not have financial knowledge. People need significant knowledge and a good set of analytic tools, simply to avoid mistakes. Financial literacy will help people to become smarter consumers, to understand the financial markets and the complex economy of the 21st century, and to adjust their financial behaviour to changing life events [Jappelli 2010; Lusardi, Mitchell 2014].

At the macroeconomic level, financial literacy has important implications for welfare, as well as a policy aimed at improving the level of financial knowledge in the population, particularly among certain demographic groups in which a low level of financial literacy has been measured, such as young people, women, minorities, people with low incomes or less educated people. These groups that are financially vulnerable are placed at an additional disadvantage by their lack of financial knowledge.

Increasing consumer financial literacy is a public goal to improve welfare among the population as a whole and among individuals. Financial literacy programs are rapidly becoming a major component of global financial policy reform [Xu, Zia 2012].

3. International Evidence on Financial Literacy

Financial literacy is usually measured on a personal level and then aggregated by groups to provide a macro view. The ability to measure and identify financial

literacy among individuals and groups of populations enables us to distinguish between diverse and vulnerable populations, serve as a benchmark for comparison between countries and within a country in different periods of time, and allows the construction of a public policy tool for financial education.

Studies around the world have established convincingly that a large proportion of the adult population knows very little about finance [Hastings, Madrian, Skimmyhorn 2013; Walter 2017]. Few people across a range of countries can correctly answer three basic financial literacy questions, demonstrating the low levels of financial literacy found around the world [Atkinson, Messy 2012; Lusardi, Mitchell 2014]. Many individuals are unfamiliar with even the most basic economic concepts such as risk diversification, inflation, interest compounding, mortgage and other debt instruments. Financial literacy is particularly low among the young, among women, and the less-educated [Lusardi, Mitchell 2011b, 2014; Atkinson, Messy 2012].

International studies report interesting patterns in other dimensions of financial illiteracy. For example, in the United States, there are large racial/ethnic differences in financial knowledge. Whites and Asians are consistently more likely to be financially knowledgeable compared to African Americans and Hispanics. It was noted that Koreans exhibited more responsible financial management behavior than Americans [Hastings, Tejada-Ashton 2008; Grable, Park, Joo 2009; Lusardi, Mitchell 2011b]. There are large geographic differences in financial literacy. For instance, financial literacy in Italy is higher in the northern and central regions than the southern regions, though not all of the Northern regions show high levels of financial knowledge [Fornero, Monticone 2010]. There are also urban/rural differences. People living in urban areas in Russia tend to be more financially literate than those living in rural areas [Panos, Klapper 2011]. There are notable differences in financial knowledge among people with different religious beliefs. In the Netherlands, religious households consider themselves more trusting, and have a stronger bequest motive and a longer planning horizon [Alessie, van Rooij, Lusardi 2011; Renneboog, Spaenjers 2011].

4. Measurement of financial literacy

Financial literacy is a new interpretation of an old idea. The idea of measuring an individual's ability to manage his or her finances and the interpretation of that idea began to take shape in the late 1950s with a research initiative on consumer education among 12th graders and its appearance in the United States [Jelley 1958 at: Remund 2010].

Not surprisingly, the absence of a conceptual and structural definition of financial literacy was one of the most prominent barriers to the development of a standardized approach for measuring it. Conceptual definitions explain abstract concepts using concrete terms. They allow abstract concepts such as financial literacy, to define clear criteria for them, and to measure them in tangible ways. Therefore, an operational

definition of financial literacy would be a prerequisite for measuring it [Hung, Parker, Yoong 2009; Huston 2010].

Hung and others [2009] reported that according to many variations of the conceptual definitions found in the literature, various methods were also identified for actual measurement of financial literacy, i.e., operational definitions. Empirical studies in financial literacy have reported two main strategies for measuring financial literacy: (1) Performance tests (objective), primarily knowledge assessment (knowledge of interest rates, interest compounding, inflation, risk diversification and general mathematical and numerical skills), (2) Self-reporting methods (subjective), assess perceived knowledge or confidence in knowledge (i.e., “how much you think you know”) [Hung, Parker, Yoong 2009].

Remund [2010] identified four categories of operational definitions to assess and evaluate financial literacy: budgeting, savings, recruitment and investment, all based on behaviour or capacity. Other dimensions that did not clearly belong to one of the four categories include understanding and buying insurance, recognizing and avoiding abusive credit plans, home counseling and risk management, real estate planning and asset transfer.. Based on an analysis of the operational settings in the literature, Raymond concluded that the preferred method among American researchers to measure financial literacy is surveys and questionnaires that adopt a broad approach to evaluating financial literacy according to the four categories mentioned above.

Hastings [2013] dates the attempts to measure financial literacy to the early 1990s with a series of opinion polls among different populations in the United States that included questions on various financial matters: bank accounts, insurance, consumer credit, and areas of major consumption such as housing, food and cars. Conducted by the Consumer Federation of America, Jump\$tart, is a survey of high school students from 1997 that has been replicated since 2000 and expanded in 2008, to include college students [Hastings, Madrian, Skimmyhorn 2013].

In 2004, Lucardi and Mitchell [2006] added a series of questions in financial literacy to the US household health and retirement survey (HRS) among those aged 50 and over, which included a module of three core questions designed to assess understanding of three key financial concepts: sustained interest rates, real rates of return, and risk diversification. These questions were formulated in condensed form and were widely adopted in the United States and are known as the Big Three. In 2006, in order to capture additional dimensions of financial literacy, Lusardi & Mitchell added two additional questions on financial literacy to the original 2004 HRS. These questions assessed financial literacy in two areas of knowledge, asset pricing and mortgages. These five items will then be recognized as the Big Five [Stople, Walter 2017; Hastings 2013]. These sets of questions have served in the past decade as the foundational questions in several surveys designed to measure financial literacy in the United States and other countries [Stople, Walter 2017]. In 2009, these questions were incorporated into a large National Survey on the Financial Capabilities (NFCS) of the adult population in the United States.

Four principles informed the design of these questions: (1) Simplicity (2) Relevance (3) Brevity and (4) Capacity to differentiate. The Big Three has quickly become an international standard in assessing financial literacy and has been widely adopted around the world. The questions have appeared in multiple tests of financial literacy, either exactly as written originally or with modifications according to the diverse of respondent population around the world.

5. Data

Data for the study were taken from the Israeli Financial Literacy Survey [CBS 2012]. The Financial Literacy Survey was performed by the Central Bureau of Statistics (CBS) at the request of the National Economic Council, in cooperation with the Ministry of Finance and the Bank of Israel. The survey was conducted from January 2012 until May 2012, among a representative national sample of approximately 1,200 persons aged 20 and over. The level of financial literacy of the Israeli population, in terms of knowledge, opinions and management was examined in a questionnaire of 102 questions with a wide variety of financial perspectives. The data was used to determine governmental policy in the field of financial education, in accordance with OECD recommendations. The survey questions were similar in terms of content to Lusardi and Mitchell's questions; however, there were differences in the wording of the questions. The literature emphasizes three basic economic concepts that individuals should have some understanding of when making economic decisions; i) interest compounding; ii) inflation; and iii) risk diversification. Financial literacy was measured using questions assessing basic knowledge of four fundamental concepts in financial decision-making: knowledge of interest rates, inflation, risk diversification, interest compounding and general mathematical and numerical skills. The questions are reported in Table 1 below.

Table 1. A complete list of questions used to assess financial literacy in Israel

Questions	Values**	Frequencies	
		Count	Probability
<i>Knowledge of interest rates</i>			
The prime interest rate is higher than the interest rate fixed by the Bank of Israel*	1 = Yes	331	0.28
	0 = No/ Don't know	821	0.71
	Total	1152	1.00
	N. Missing	62	
<i>Definition of inflation</i>			
In a period of high inflation, the price of living rises quickly *	1 = Yes	743	0.65
	0 = No/ Don't know	399	0.34
	Total	1142	1.00
	N. Missing	72	

Questions	Values**	Frequencies	
		Count	Probability
<i>Knowledge of interest rates</i>			
<i>Risk diversification</i>			
The risk of an investment portfolio can be decreased by diversifying its investment products *	1 = Yes	403	0.35
	0 = No/ Don't know	732	0.64
	Total	1135	1.00
	N. Missing	79	
Investment with a high return (high profit) is usually a high-risk investment* (i.e. with a high probability of loss)	1 = Yes	555	0.48
	0 = No/ Don't know	582	0.51
	Total	1137	1.00
	N. Missing	77	
<i>General mathematical and numerical skills</i>			
Say you've made a one-time investment of NIS 1,000 in a savings account which yields an interest of 2% a year. How much money would accumulate in the account at the end of the first year (the account isn't linked to the consumer price index, the total is before taxes are deducted)?	1 = correct answer	507	0.79
	0 = wrong answer	129	0.20
	Total	636	1.00
	N. Missing	578	
<i>Interest compounding</i>			
Say you've made a one-time investment of NIS 1,000 to a savings account which yields a compound interest of 5% a year. How much money would accumulate in the account at the end of two years (the account isn't linked to the consumer price index, the total is before taxes are deducted)? (i) More than NIS 1,100; (ii) Exactly NIS 1,100; (iii) Less than NIS 1,100; (iv) Do not know; (v) It is not possible to know from the information provided	1 = correct answer	326	0.28
	0 = wrong answer	833	0.71
	Total	1159	1.00
	N. Missing	55	

Source: Author's own elaboration.

Notes: *All of the four statements presented to the persons sampled were correct ones. ** The answer scale has been replaced by a binary scale from multiple choice options to serve the statistical needs of the study.

The independent variables were selected and introduced into the model based on their impact on financial literacy and reliance on previous work. Gender, occupation A (academic/ non-academic), occupation C (management/ non-management), income, education, number of persons in household, age, education, sector and region were the independent variables in the regression analyses [Lusardi, Tufano 2009; Van Rooij et al. 2011; Yoong 2011]. Summary statistics for the variables and the variables description are reported in Table 2 below.

Table 2. Descriptive statistics and statistical significance for independent variables

Variables	Values**	Frequencies	
		Count	Probability
Gender	1 = Male	589	0.48
	2 = Female (unchanged)	625	0.51
	Total	1214	1.00
	N. Missing	0	
Occupation A	1 = Academic	122	0.10
	0 = Non-Academic	1092	0.89
	Total	1214	1.00
	N. Missing	0	
Occupation C	1 = Manager	159	0.13
	0 = Non-Manager	1055	0.86
	Total	1214	1.00
	N. Missing	0	
Income	1 = Less than NIS 7,501	462	0.55
	0 = NIS 7,501 or more	322	0.38
	non + Refusing to answer	43	0.05
	Total	827	1.00
	N. Missing	387	
Education	1 = 13-16+ years of schooling	816	0.67
	0 = 1-12 years of schooling	397	0.32
	Total	1213	
	N. Missing	1	
Household size	1 = Large (6+)	191	0.15
	2 = Small (1-5)	1023	0.84
	Total	1214	
	N. Missing	0	
Age	1 = Young (20-29)	325	0.26
	2 = Adults (30+)	888	0.73
	Total	1213	
	N. Missing	1	
Sector	1 = Jew & Other	1052	0.86
	0 = Arab	162	0.13
	Total	1214	
	N. Missing	0	
Region	1 = Centre	491	0.40
	2 = Periphery	719	0.59
	Total	1210	
	N. Missing	4	

Source: Author's own elaboration.

Note: ** The answer scale has been replaced by a binary scale from multiple choice options to serve the statistical needs of the study

6. Methodology

As the aim of this paper was to analyse financial literacy in Israel, the following research questions were proposed: (1) What are the factors that influence financial literacy in Israel? (2) How does the integration between region and sector affect financial literacy?

A quantitative measure of financial literacy was created based on responses to the six questions that appeared in the Israeli survey data. The six questions included one on each of the topics of knowledge regarding interest rates, inflation, interest compounding and general mathematical and numerical skills, investment, credit, inflation and money management, and two questions on the topic of risk diversification. A financial literacy index was created and based on previous literature [Hung, Parker, Yoong 2009; Atkinson, Messy 2012], its value is equal to the number of correct responses to the six questions. The value of the index could range from 0, if the respondent answered all six questions incorrectly, to 6, if all of the answers were right. A set of socio-demographic variables, gender, occupation A (academic/ non-academic) occupation C (management/ non-management), income, education, number of persons in household, age, education, sector and region) were the independent variables in the regression analyses. The descriptive statistics in Table 2 show the distribution of the sample. To further examine the factors that may be predictors of financial literacy after controlling for other related variables, regression analyses were conducted. To address the first research question regarding the factors that influence financial literacy in Israel, a multiple linear regression was used to analyse a data set that included the data from the Israeli Survey. The financial literacy index was the dependent variable and the full sets of socio-demographic variables were included as independent variables. The second research question regarding the integration between sector and region and their effect on financial literacy was also investigated using a multiple linear regression analysis. Financial literacy is the dependent variable and the region and sector were included as independent variables.

7. Results

The results presented in Table 1 indicate the level of financial literacy found among respondents in Israel. About 30% of respondents knew how to answer the first statement, 65% knew how to answer the second statement, 35% knew how to answer the third statement, and 48% responded correctly to the fourth statement. In addition, 80% of the respondents knew how to calculate annual interest and only 30% were able to calculate compound interest. Descriptive statistics for the dependent and independent variables are reported in Table 3; gender, occupation, education, number dependent on household, age were found to have a significant effect on financial literacy in Israel. Sector and region, each independently, did not have a significant effect on financial literacy in Israel.

Table 3. Model 1 estimates

	Estimate	Std Error	t Ratio	Prob> t
Intercept	1.685	0.205	8.22	0.0001
Sector [Arab/ Jew & Other]	-0.313	0.192	-1.63	0.1032
Gender [Female/ Male]	-0.640	0.130	-4.91	0.0001
Education	0.619	0.157	3.94	0.0001
Age [Young/ Adults]	0.388	0.163	2.37	0.0181
Household size [Large/ Small]	-0.696	0.191	-3.64	0.0003
Income	0.569	0.140	4.07	0.0001
Occupation A [Academic/ non-Academic]	0.877	0.189	4.63	0.0001
Occupation C [Manager/ non-Manager]	1.140	0.252	4.52	0.0001
Region [Centre/Periphery]	0.088	0.132	0.67	0.5058

Source: Author's own estimations.

Note: R-square: 0.210362, Adjusted R-square: 0.200122, Prob>F: 0.0001

In Table 4, the interaction between two independent variables, sector and region, made their impact on financial literacy unambiguously significant. Additional results obtained from the model were that women in Israel have lower levels of financial literacy, financial literacy is associated with higher levels of income and education, adults aged 30+ are more literate than young people aged 20-29, individuals living in a large households are less literate than individuals living in a small households, a higher level of financial literacy measured among academics than non-academics, there were significant differences in financial literacy between managers and non-managers, managers were found to have higher levels of financial literacy, higher levels of financial literacy were measured in the centre than in the periphery, A higher level of financial literacy was measured in managers than in academics (indirect conclusion).

Table 4. Interaction between region and sector and their effect on financial literacy

	Estimate	Std Error	t Ratio	Prob> t
Intercept	1.482	0.209	7.08	0.0001
Gender [Female/ Male]	-0.641	0.129	-4.96	0.0001
Education	0.816	0.199	4.09	0.0001
Age [Young/ Adults]	0.395	0.163	2.42	0.0157
Household size [Large/Small]	-0.722	0.188	-3.84	0.0001
Income	0.555	0.139	3.99	0.0001
Occupation A [Academic/non-Academic]	0.891	0.189	4.72	0.0001
Occupation C [Manager/non-Manager]	1.149	0.251	4.57	0.0001
Region [Centre/Periphery]	0.550	0.263	2.09	0.0374
Region - Sector [Arab/Jew & Other]	-0.990	0.366	-2.70	0.0071
Region - Education	-0.457	0.301	-1.52	0.1291

Source: Author's own estimations.

Note: R-square: 0.217653, Adjusted R-square: 0.206364, Prob>F: 0.0001

8. Conclusions

This research used variables from a database obtained from the “Financial Literacy Survey in Israel” to assess financial literacy and to understand the impact of region and sector on financial literacy in Israel. A number of variables were found to have a significant effect on financial literacy in Israel: gender, occupation, education, number dependent on household and age. The variables sector and region, each independently, did not have a significant effect on financial literacy in Israel. Results suggest critical differences in the effect of the interaction of the independent variables; sector and the region on financial literacy in Israel. The interaction between the two independent variables made their impact on financial literacy unambiguously significant. An interesting future subject for complementary research is to try to explain the causes of the phenomenon. These results shed further light on the discussions on financial literacy and provide evidence linking independent variables that constitute mediators, whose mutual interaction enhances their impact on financial literacy. An attempt to examine whether education can mediate between region and financial literacy in the same way has not produced similar results. The influence of region on financial literacy remains insignificant.

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