Measuring Financial Literacy in Post-Apartheid South Africa: A Quantitative Examination of a Multi-Dimensional Concept

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Abstract

The global economic downturn, coupled with rising consumer prices, indebtedness and persisting unemployment, has meant hard times for many South Africans. Recognition of this has prompted interest in financial education as well as scientific interest in measuring financial literacy in the country. The purpose of this study is to report on research on financial literacy that was commissioned by the South African Financial Services Board as a basis for identifying vulnerable groups that would most benefit from financial education programmes. The study uses data from the nationally representative Financial Literacy Baseline Survey conducted in 2011 by the Human Science Research Council. The survey adopted the Economic Co-operation and Development International Network on Financial Education approach of assessing four dimensions of financial capability: financial control, financial planning, product choice, and financial knowledge. The results indicate that a sizeable proportion of the population lacks knowledge of basic financial concepts and is under strain to maintain financial commitments. Multivariate modelling is employed to examine the socio-demographic correlates of the four dimensions of financial literacy. Regression modelling reveals that economic status and educational attainment are strong predictors across all domains. Age also emerges as a strong determinant of financial literacy, with significant generational differences present. The study highlights the need for the forthcoming national consumer financial education strategy to establish a set of differentiated and adaptive interventions that will incrementally promote financial inclusion and improve awareness of financial products and services for vulnerable groups. Periodic multidimensional evaluations of financial literacy are required in order to identify target groups and their changing needs as well as monitor the cumulative effect of interventions directed at producing a more financial capable citizenry.

Introduction

In recent years, financial literacy has gained the attention of a wide range of scholars as well as major banking groups, government agencies and community interest organisations. This interest is the result of the growing recognition by scholars, and others, of the value of financial knowledge and experience (Huston 2010; Jappelli 2010; Remund 2010; Lusardi and Mitchell 2011). Not only does financial illiteracy impact on the individual's or families' day-to-day money management but also influences their ability to save for long-term goals and become financially independent at retirement. However, the vast majority of studies of financial literacy have primarily taken place within the context of developed nations (Holzmann, 2010). Financial literacy is less well understood in the developing world which has an impact on financial literacy programmes in developing countries. This paper aims to expand our knowledge of financial literacy in the developing world by using South Africa as a case study.

The authors will contribute to the existing body of research on financial literacy by using a new methodological framework for measuring financial literacy. This study will be one of the first to utilise public survey data using the multi-dimensional International Network on Financial Education (INFE) of the Organisation for Economic Co-operation and Development (OECD) approach. The survey instrument used was a special survey (commissioned by South African Financial Services Board) from the South African Social Attitudes Survey (SASAS) series. Four dimensions are employed to measure financial literacy, allowing the multifaceted nature of the concept to be better captured than may have been done in previous surveys that measure financial literacy. As a result the study can be considered a good test case for the applicability of the INFE OECD approach in providing information on financial attitudes, behaviour and understanding.

Analysing financial literacy in South Africa will allow the determinants identified in developed world to be assessed in the developing, permitting a test of their salience in different economic contexts. Post-apartheid South Africa is a particularly interesting case from which to understand the determinants of financial literacy. Modern South Africa faces considerable challenges, overcoming unemployment, poverty and inequality during a period of global economic uncertainty and slow growth. Such challenges are compounded by the legacy of racial oppression which saw a majority of South Africans effectively excluded from

financial institutions, forbidden to start commercial businesses and denied access to financial education. This paper will review the existing scholarship on financial literacy determinants and, based on this review, present hypotheses for testing. In this way the authors will make a significant contribution to our understanding of the determinants of financial literacy in a developing country.

Multiple Definitions of Financial Literacy

One of the chief obstacles to measuring financial literacy is the lack of a common definition of the concept among scholars. Huston (2010) reviews the literature on financial literacy to better understand the financial literacy measures used in research over the last decade, examining seventy-one individual studies drawn from fifty-two different data sets. In her review, she notes that scholars, whether they are located in consumer behaviour, sociology or education, have not been able to reach a consensus on how financial literacy can be defined. Similar findings are evident in other reviews of the current literature on financial literacy (Hung et al. 2009; Kempson 2009; Remund 2010; Atkinson and Messy 2011; Lusardi and Mitchell 2011). Huston (2010, p.305) argues that not having "a precise and consistent construct conception limits the ability to conduct comparative analyses or assess financial literacy rates and their subsequent impact on financial well-being"[1]. The problem of defining financial literacy is related to the multi-dimensional nature of the concept.

One of the key problems related to defining financial literacy is whether that definition should include behaviour and attitudes as well as knowledge. Hung et al. (2009) conducted a review of a wide variety of definitions of financial literacy across studies and noted that opinions vary greatly. A segment of researchers believe that financial literacy can be exclusively comprehended by focusing on general knowledge of financially concepts and topics while others include measures attitudes and behaviour such as financial "experience" or financial decision making (also see Kempson 2009; Huston 2010; Atkinson and Messy 2011; Lusardi and Mitchell 2011). Based on an analysis of the scholarship over a decade, Remund (2010, p.279) argues that the definitions of financial literacy are so divergent that he is forced to subdivided them into five groupings: (1) knowledge of financial concepts; (2)

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[1] Indeed, it should be pointed out that there have been several studies published on financial literacy which have not defined the concept. Of the seventy-one studies examined by Huston (2010, p.303) 72% did not include a definition of financial literacy.

ability to communicate about financial concepts; (3) aptitude in managing personal finances; (4) skills in making appropriate financial decisions; and (5) confidence in planning effectively for future financial needs. From this review of the literature on defining financial literacy, it seems clear that a multi-dimensional definition is required.

A lack of a common definition of financial literacy has resulted in a number of divergent methods of measuring financial literacy. Huston (2010) found that when assessing respondents' levels of financial literacy, researchers employed questions covering a wide variety of topics, including insurance, credit cards, mortgages, retirement savings, budgeting, inflation, and comparison shopping. While some studies included a broad selection of these areas, others focused on only a single aspect. In addition, the number questions employed in surveys to measure financial literacy varies greatly (Kempson 2009; Atkinson and Messy 2011). In their review, Hung et al. (2009) note that many previous studies on financial literacy have been constrained in their use of financial literacy questions (also see OECD 2005; Lusardi and Mitchell 2011). Although some surveys use a wider range of questions to collect detailed information, most notably the 2004 Health and Retirement Survey, the sample of these surveys are often restricted to a specific age group. As a result of the different approaches to measuring financial literacy, there has been little consistency over the decade in how financial literacy has been measured.

The International Network on Financial Education (INFE) and a New Approach to Measuring Financial Literacy

As a solution to the definitional problems evident in the financial literacy scholarship, the INFE developed a multidimensional definition of financial literacy. According to this definition, financial literacy was not limited to knowledge of financial concepts but rather was defined as "a combination of awareness, knowledge, skills, attitude and behaviours necessary to make sound financial decisions and ultimately achieve individual financial wellbeing" (Atkinson and Messy, 2011, p. 4). As a result the measure of financial literacy was subdivided into four principal domains namely financial knowledge, financial planning, financial control and product choice. This approach builds primarily on work done by the British Financial Services Authority (FSA) in the United Kingdom and is based on qualitative focus group methods and exploratory investigations (Atkinson et al., 2006; Atkinson et al. 2007). This approach has subsequently been employed in a number of other country contexts,

such Canada (Arrowsmith and Pignal, 2010) and Romania (Stănculescu, 2010). This paper will now discuss the different dimensions of financial literacy and their relevance to the existing literature.

Financial Knowledge

Knowledge is the most common, and perhaps the most recognisable, element of the numerous definitions of financial literacy. Huston (2010, p.302) found that almost half (47 per cent) of the financial literacy studies reviewed used "financial literacy" and "financial knowledge" interchangeably. Different elements of financial knowledge are covered by almost all surveys on financial literacy with a priority given to numeric questions as numerical skills are considered important in building financial skills. An extensive literature exists, showing that numerate individuals are better able to make financial decisions. For example Banks and Oldfield (2007) found using the English Longitudinal Study of Ageing, that numerical ability was positively associated with better understanding of pension plans, retirement saving and financial security (also see Smith et al. 2010). Studies of financial knowledge also investigate knowledge about important financial concepts such interest and inflation. For example, Van Rooij et al. (2011b), using a special module of the Dutch De Nederlandsche Bank Household Survey, studied financial literacy by asking numerical questions. Van Rooij and his colleagues also tested respondents on their knowledge of basic financial concepts such as compound interest, inflation, stock market functioning, characteristics of stocks, mutual funds and bonds, equity premiums, and the benefits of diversification. Such questions are common in a number of studies of financial knowledge (see, for example, Atkinson et al. 2007; Lusardi and Mitchell 2007; Remund 2010; Lusardi and Mitchell 2011). This growing body of scholarship suggests that financial knowledge is an important component of any study of financial literacy.

Financial Planning

Financial planning is considered an important component of financial literacy studies, with scholars validating the importance of planning by referencing how the propensity to plan can improve financial well-being. For example, Lusardi and Mitchell (2007), using the Rand American Life Panel, investigated the impact of planning on financial outcomes, finding that individuals with a tendency to plan are more likely to engage in saving behaviours and hold high levels of knowledge about financial concepts (also see Ameriks et al. 2003). Planning may also have an impact on financial well-being. A number of studies have found that

planning has an impact on how individuals approach financial distress and cope with debt according to a number of studies (see, for example, Lea et al. 1995; Livingstone and Lunt 1992). Households who were found to plan and manage their finances responsibly tended to cope better with financial distress and have less debt than their counterparts who were found not to plan. This indicates the importance of providing a measure of financial planning in understanding and measuring financial literacy in any given context.

Financial Control

In surveys of financial literacy, questions related to financial attitudes and day-to-day money management are also considered fairly common. For example, Hilgert et al. (2003) included financial behaviour questions to the nationwide Survey of Consumer Finances[2] (also see (Atkinson et al. 2007; Kempson 2009; Atkinson 2011). The studies on financial planning correspond with wider literature regarding the impacts of saving behaviour and time preference. According to Walker (1996, p.792) the ability to exercise self-control has long been associated with financial decision-making and "the choice of whether to delay gratification, for example by saving, or to spend now, or even to borrow to buy now instead of waiting" is an important test of financial responsibility. A number of studies have also found that being more 'forward-looking' is positively correlated with saving behaviour and the ability to cope with financial stress (also see Lea et al. 1995). Given the positive role that financial control can play, it is therefore vital to measure financial control in individuals.

Product Choice

The ability to choose appropriate products is an important area to cover in any study of financial literacy. Several studies focus on consumers' product choices and how they make decisions about financial products. Some scholars are interested in stock market participation and investigate the propensity to hold investment products (Guiso and Jappelli 2005; van Rooij et al. 2011a) while others are more concerned with holding retirement products (Lusardi 1999; Banks and Oldfield 2007; Lusardi and Mitchell 2007; van Rooij et al. 2011b). How financial decisions are made is also an important aspect of the financial literacy scholarship and questions on choosing financial products are included in a number of financial literacy surveys (Donkers and van Soest 1999; Parker and Fischhoff 2005; Smith et al. 2010). A survey for the British FSA in 2000, for example, captured information on

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[2] From these questions, Hilgert et al. (2003) created the Financial Practices Index to measure behaviour based on four variables: cash-flow management, credit management, savings, and investment practices.

consumer behaviour and information needs when they had purchased financial products (Atkinson et al. 2007). These studies all show that an examination of financial decision making is an important component of any measure of financial literacy. It is, therefore, essential to provide a measure of financial product choice.

Determinants of Financial Literacy

In the last decade a new generation of survey research have found that the adult population in most countries knows relatively little about finance and is unfamiliar with economic concepts such as inflation, interest compounding and risk diversification (Hilgert et al. 2003; OECD 2005; Atkinson et al. 2007; Lusardi 2008; Jappelli 2010). The work of these surveys suggests that financial literacy is also highly uneven distribution among any given population. The existing scholarship also suggests that certain key socio-economic characteristics, such as education or income, are associated with financial literacy. This article will draw on the existing academic literature to identify those characteristics most associated with financial literacy. This review of the literature will allow the authors to construct hypotheses that can be tested empirically in South Africa using the INFE OECD framework.

Typically most studies have found that poorer individuals tend to have low levels of financial literacy. Guiso and Jappelli (2005), for example, using the 1995 and 1998 Bank of Italy Surveys of Household Income and Wealth, found that respondents' awareness of the existence of stocks, mutual funds, and investment accounts is positively correlated with household resources (also see Donkers and Van Soest 1999). In a USA study using survey data on adults aged 20-40, Perry and Morris (2005) found that consumers' propensity to save, budget, and control spending depends on an individual's financial resources. The relationship between financial literacy and wealth accumulation is, however, somewhat unclear. It is possible that reverse causality may better explain this association[3]. Interestingly, Willis (2009) argues that the motivation to attain financial knowledge is positively correlated with economic resources (also see Monticone 2010). As a result the motivation to attain financial knowledge is greater for individuals with economic resources available for use in financial behaviour, such as saving and investment.

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[3] A key limitation of many studies that investigate the correlation between economic capital and financial literacy is the strong possibility of endogeneity bias.

Hypothesis 1: *Economic position is positively associated with financial literacy, with those individuals in economically advantageous positions more likely to exhibit high financial literacy.*

In the extensive literature measuring differences in financial literacy between different demographic groups, a common finding is that educational attainment is associated with educational attainment (Huston 2010; Lusardi and Mitchell 2011). Focusing on retired or retiring age groups, Lusardi (1999) found, using the American 1992 Health and Retirement Study, that an absence of planning was more common among the poorly educated. Guiso and Jappelli (2008), in their Italian study, also found that higher level of education correlates not only with financial knowledge but also with more responsible financial behaviour (also see Meier and Sprenger 2008). This may be linked to the cognitive abilities that are often acquired in the process of formal education.

Hypothesis 2: *Educational attainment will be positively associated with financial literacy, with those less educated individuals more likely to have low financial literacy.*

A number of scholars have investigated the relationship between age and financial literacy, finding evidence of an inverse U-shaped age profile (see, for example, Monticone 2010; Lusardi and Mitchell 2011). Younger and older individuals are more likely to report low financial literacy scores while those in the centre –those in middle age –will exhibit high scores. The first increase in financial literacy as an individual reaches middle age is commonly linked to the acquisition of experience. Hilgert et al. (2003), using the 2001 University of Michigan Survey of Consumers, found that financial experience was a powerful predictor of financial knowledge and financial management (in terms of credit management, savings, cash flow management, and investments). The decrease noted following the individual entering old age may result from a decline in cognitive function.

Hypothesis 3: *A non-linear relationship will be observed between age and financial literacy, with those in middle age exhibiting higher financial literacy than the young and the old.*

A relationship may exist between financial literacy and race groups. The current research on financial literacy seems to suggest that differences exist between racial groups in those countries where ethnicity and financial literacy have been examined. Lusardi et al. (2010), for

example, found racial differences in their United States study with White respondents more likely than African American and Hispanic counterparts to answer financial literacy questions accurately. This finding is similar to other research that investigated race and financial literacy. Lusardi (1999) found that African-Americans and Hispanics were less likely engage in financial planning for the future. Perry and Morris (2005) find that financial management behaviour seems to vary by race and ethnic background (also see Lusardi and Mitchell 2007). The differences observed between racial groups may be the result of different social, economic and cultural factors associated with those groups. Studies on attitudes towards money, like Furnham and Argyle (1998), argue that different ethnic and national cultures seem to have differing attitudes towards money. In South Africa, as in the United States, it is probable that financial literacy will differ between racial groups.

Hypothesis 4: *A racial hierarchy will be evident in financial literacy scores, with differences observed between racial groups in South Africa.*

A gender basis has been noted in a number of studies on financial literacy. In an early study of attitudes towards money, Furnham (1984) found that men were more obsessed with money than women. Such obsession may suggest financial literacy differences between the sexes. Existing research on the determinants seems to confirm that gender has an impact on financial literacy. Lusardi et al. (2010) found, in their study of young people, that women were less likely than their male counterparts to answer financial literacy questions correctly. Similar results were found in a study using data from the Health and Retirement Survey (see Lusardi and Mitchell 2008). Being female is also associated with lower financial knowledge in a number of European studies (also see for the Netherlands Van Rooij et al. 2011b and for Italy, Guiso and Jappelli 2008). This may be the result of a cultural patriarchy in financial education and financial institutions that discriminates against women.

Hypothesis 5: *A gender basis in financial literacy will be noted, being male will be positively associated with a high financial literacy score.*

Methodology

Survey Data

The study uses data from the nationally representative Financial Literacy Baseline Survey conducted in 2011 by the Human Science Research Council, consisting of 3,057 respondents older than 15 years. The baseline survey was commissioned by the Financial Services Board as a basis for identifying vulnerable groups that would most benefit from financial education programmes. The baseline survey was part of the South African Social Attitudes Survey (SASAS) series, an attitudinal survey of adults who lived in households, hostels and other structures in South Africa. To ensure that the sample was also representative in terms of the ethnic and cultural diversity of South Africa, geo-demographic categories (which were developed from national census data) were used as the implicit stratification variable. These geo-demographic categories reflect the diversity of the South African population based on their rural/urban, income, education, ethnicity and geographic characteristics. Households were pre-selected and then one household member who was 16 or older was selected randomly as a respondent to complete the questionnaire in the language of his or her choice. The fieldwork commenced on 10 November 2011 and ended on 20 December 2011.

Dependent Variables

Using the framework developed by the OECD, four domains were created to measure financial literacy in South Africa. A set of 22 core indicators spread across each of the aforementioned financial literacy domains was then developed to accurately measure financial literacy. These indicators sought capture a multiple forms of financial capability and knowledge. These indicators have been piloted in 12 low, medium and high income countries exhibiting diverse characteristics (Atkinson and Messy 2011). As a result, these questions have already been tested for analytical soundness, measurability and relevance to the phenomena being measured and their relationship to each other[4]. The construction of the four domains will now be discussed.

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[4] These measures were accepted by the South African Financial Services Board (FSB) and used in their baseline study on South Africans' financial literacy.

The financial control domain

An individual with financial control is defined as someone who tends to be involved in daily financial decision-making processes, exhibits careful approach to personal finances, prefers saving over spending money and lives in a household that budgets and is able to make ends meet. In order to measure financial control six indicators were used, the indicators and exact wording of the questions are depicted in the table below:

Table 1: Questions used to create the Financial Control Domain

		Financial Control Domain
Indicator 1	Personal Involvement in Daily Household Money Management	Who is responsible for day-to-day money management decisions in your household?
Indicator 2	Presence of a Household Budget	Do you have a household budget?
Indicators 3	*Considered Approach to Personal Finances*	
	* Careful Spending	How often do you: Before I buy something I carefully consider whether I can afford it?
	* Paying Bills Timeously	How often do you: I pay my bills on time?
	* Monitoring Financial Matters	How often do you: I keep a close personal watch on my financial affairs?
Indicators 4	*Making Ends Meet*	
	* Making Ends Meet	Sometimes people find that their income does not quite cover their living costs. In the last 12 months, has this happened to you?
	* Main Coping Response	What did you do to make ends meet the last time this happened? and Of the things you mentioned, which does your household rely on the most?
Indicator 5	Preference for Spending or Saving	Do you agree or disagree: Money is there to be spent?

Information for indicators 1 and 2 were captured as dichotomous variables (i.e. 1= personal involved in money management; otherwise =0 for indicator 1 and 1 = presence of household budget otherwise =0 for indicator 2). Answers to the questions on indicator 3 were each captured using a five-point scale which ranged from 1 "Always" and 5 "Never". These responses were reversed and then summed together to produce a single score. Responses to indicator 4 were coded as a three-point categorical variable with 1 representing in debt due to financial shortfall, 2 not

in debt due to financial shortfall and 3 did not experience financial shortfall. Finally answers to indicator 5 were captured using a five-point Likert scale with 1 representing "strongly agree" and 5 "strongly disagree", indicator 5 was recoded in order to reverse this scale.

The financial planning domain

Good financial planning constituted setting financial goals and working hard to meet them, preferring to save for the long term and worrying about tomorrow, having emergency funds in place and having saved recently (through a formal savings product or informal means). Financial planning was measured using five indicators which are displayed in the table below.

Table 2: Questions used to create the Financial Planning Domain

		Financial Planning Domain
Indicator 6	Tends to set and strive to achieve long term financial goals	Do you agree or disagree: I set long-term financial goals and work hard to achieve them?
Indicator 7	Has emergency funds or rainy day funds	Have you set aside emergency or rainy day funds that would cover your expenses for 3 months, in case of sickness, job loss, economic downturn, or other emergencies?
Indicators 8	Preference for spending money vs long-term saving	Do you agree or disagree: I find it more satisfying to spend money than to save it for the long term?
Indicator 9	Living for today vs long term provisioning	Do you agree or disagree: I tend to live for today and let tomorrow take care of itself?
Indicator 10	Saved money in last 12 months	In the past 12 months have you been saving money in any of the following ways?

Responses to indictor 6 are measured using a five-point scale with 1 representing "Always" and 5 "Never". Indicator 6 was recoded in order to reverse this scale. Answers to indicator 7 were captured dichotomously (1=had emergency funds 0=otherwise). Information captured was from indicator 8 and 9 using a five-point Likert scale with 1 representing "strongly agree" and 5 "strongly disagree". Indicator 8 and 9 (like indicator 6) were recoded in order to reverse this scale. Finally responses to indicator 10 were coded to be dichotomous and represent had saving through a saving product in the last 12 months (1=had saved 0=otherwise).

The product choice domain:

In order to understand product awareness and holding, respondents were asked if they had heard of and were holding any of 50 selected financial product types. The list of products was subdivided into four categories (banking, credit and loan, investment and savings, and insurance) and included both informal as well as formal products of these types. Subsequent questions on decision-making behaviour and experience were also included in this domain. In summation, the product choice domain measures individual (A) awareness of different types of banking, credit/loan, savings and investment, and insurance products; (B) holding of these product types; (C) confidence in understanding of product needs and propensity to undertake research before choosing products; (D) experiences of regrets about recent financial product decisions. The indicators used to measure the product choice domain are included in the table below.

Table 3: Questions used to create the Product Choice Domain

Product Choice Domain		
Product awareness		
Indicators 11	* Banking Products	How many of these 12 banking product types are you aware of?
	* Credit and Loan Products	How many of these 12 credit and loan product types are you aware of?
	* Investment and Savings Products	How many of these 11 investment and saving product types are you aware of?
	* Insurance Products	How many of these 15 insurance product types are you aware of?
Product holding		
Indicators 12	* Banking Products	How many of these 12 banking product types are you holding?
	* Credit and loan Products	How many of these 12 credit and loan product types are you holding?
	* Investment and Savings Products	How many of these 11 investment and saving product types are you holding?
	* Insurance Products	How many of these 15 insurance product types are you holding?
Financial product decision-making		
Indicators 13	* Have Clear Idea of Product Need	Do you agree or disagree: I've got a clear idea of the sorts of financial products or services that I need without consulting a financial adviser?
	* Informed Product Choice	Do you agree or disagree: I always research my choices thoroughly before making any decisions about financial products or services?

		Experience of regret about recent financial product choice
Indicators 14	* Does not Regret any Key Financial Decisions Made in Last Year	In the last 12 months, have you made a decision about any of the following that you later regretted?
	* Did not Pay for an Unsuitable Product in Last Five Years	Within the last five years, have you discovered that you had been paying for a financial product that was clearly unsuitable for your needs?

Responses to the questions in indicators 11 and 12 were converted into 0-100 scores based on the number of financial products that an individual was aware of and was holding. Answers to the questions on indicator 13 were captured using a four-point scale with 1 representing "totally agree" and 4 "totally disagree". Indicator 13 was recoded in order to reverse this scale. Information for the questions on indicator 14 were recoded into a 0-1 variable where 1 represented having not regretted a financial decision types[5] in a recent period.

The financial knowledge domain

Financial knowledge was defined as an individual's knowledge of basic numeracy and the following financial concepts: effects of inflation, interest paid on loans, interest on deposits, compound interest, risk of high return investments, effects of inflation on cost of living and risk diversification. Respondents were asked questions on each of these financial concepts as well as basic mathematical division in order to determine their financial knowledge. Each question was converted into a dichotomous variable with 1 representing a correct answer and 0 otherwise. The exact wording of these questions is displayed in the table below.

Table 4: Questions used to construct the Financial Knowledge Domain

		Financial Knowledge Domain
Indicator 15	Basic mathematical division	Imagine that five friends are given a gift of R1 000. If the friends have to share the money equally how much does each one get?
Indicator 16	Effects of	Now imagine that the friends have to wait for one year to get their share of the R1, 000 and inflation remains

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[5] The different types of financial decisions were (i) savings or investments, (ii) taking out a home loan, (iii) taking out a loan or credit agreement, (iv) insurance of any type, (v) tax and (vi) managing credit/debt.

	inflation	the same. In one year's time will they be able to buy…?
Indicator 17	Interest paid on loans	You lend R25 to a friend one evening and he gives you R25 back the next day. How much interest has he paid on this loan?
Indicator 18	Interest on deposits	Suppose you put R100 into a savings account with a guaranteed interest rate of 2% per year. You don't make any further payments into this account and you don't withdraw any money. How much would be in the account at the end of the first year, once the interest payment is made?
Indicator 19	Compound interest	And how much would be in the account at the end of five years? Would it be....?
Indicator 20	Risk of high return investments	Do you agree or disagree: If someone offers you the chance to make a lot of money it is likely that there is also a chance that you will lose a lot of money?
Indicator 21	Effects of inflation on cost of living	Do you agree or disagree: High inflation means that the cost of living is increasing rapidly?
Indicator 22	Risk diversification	Do you agree or disagree: It is less likely that you will lose all of your money if you save it in more than one place?

In order to discern the data required for the creation of the domains, all the indicators listed in the domain tables were transformed to render them comparable. Each indicator was converted to a 0-100 scale to enable the authors to compare and plot findings of the various indicators on a single platform. The relevant indicator on each domain was then converted into a 0-100 score. The higher the score on the 0-100 scale the higher the financial literacy, with 0 representing the lowest possible score associated with financial literacy. In order to identify vulnerable groups, bivariate analysis was conducted. However, it was also important to understand the determinants of financial literacy in South Africa. This multivariate methodology was carried out in order to understand and explore the relationships between certain dependant variables and basic characteristics (independent variables) of the survey respondents. Four linear regression models for each of the domains were created to explore these relationships.

Independent Variables

Age cohorts were used as a measure of age as this study predicts that a non-linear relationship will be observed between age and financial literacy. Since literature suggest there is a relationship between education and financial literacy, educational attainment was measured as a set of five categorical variables (junior primary and below, senior primary, incomplete secondary, complete secondary and tertiary). We control for monthly household income per capita[6] to account for economic status. As there may also be substantial nonlinearities between income groups and financial literacy, we derived the following monthly household income per capita groups: ≤499, 500-1499; 1500-4999; 5000-9999; 10000+. We also control for labour market position which was derived from the question: "what is your current employment status?" and reduced to five categories (employed, unemployed, student, retired and labour inactive). Since marital status may have a bearing on financial literacy, a marital status variable (married, divorced/widowed and never married) was created. In addition, we control for geographic type (urban formal, urban informal, rural traditional authority areas, and rural farms), gender (male and female) and race/population group (white; coloured; Indian and black African).

Results

Bivariate Results

The majority of South Africans scored low on all domains measuring financial literacy. On the first three domains, which measure financial behaviour and attitudes, this is not surprising considering the challenges faced by many South Africans during the difficult financial climate of 2011. However, the low scores observed on the financial knowledge domain (which only measures cognitive ability) points to faults in the country's consumer education strategy over the last ten years. To better understand financial literacy, it is necessary to compare domain scores across the post-apartheid nation's subgroups. In order to provide this, Table 5 lists all the financial domain scores side by side to provide a comprehensive level of evaluation between the scores under discussion. A comparison at this level makes it possible

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[6] A number of respondents did not answer the question on household income, with 13.53 % of the sample refusing to answer, 3.15% reporting they did not know their household income and 2.76% of the sample not giving any answer to the question. Those respondents who answered 'did not know' or refused to answer were excluded from the multivariate analysis.

to discern the similarities between the financial domain scores. It is evident that those scored highly in one domain tended to score highly in others.

Wealthy respondents were more likely than the poor to have high scores on the financial domain scores. Other indicators of class, such as employment status, seem to confirm this trend with economically active South Africans reporting, on average, higher domain scores than the unemployed or students. These results seem to suggest that economic position is positively associated with financial literacy which supports the first hypothesis. Educational attainment seems to show a strong correlation with all domains, with those less educated individuals having lower literacy domain scores than their more educated counterparts. This seems to confirm the second hypothesis. On the financial control, financial planning and (to a lesser extent the) product choice domains, substantial differences were noted between those with a tertiary qualification and the other educational attainment categories. This suggests a non-linear relationship between these domains and educational attainment. This trend is less evident with regards to the financial knowledge domain.

It is evident from the table above that age cohort has an effect on financial literacy although the effect is somewhat weaker than expected on financial knowledge. The non-linear relationship predicted between age and financial literacy is most clear when looking at the product choice. However, such a relationship is less evident when the other domains are considered. Substantial racial group differences were observed, with white and Indian South Africans scoring higher, on average, in all domains than their black African or coloured counterparts. This seems to indicate strong support for the fourth hypothesis. Finally, the bivariate analysis found weak support for the fifth hypothesis. Men were found to be score higher on all domains but the gender difference noted was minor and the significance of the relationship smaller than anticipated (particularly on the financial control and financial planning domains).

Table 5: Mean financial literacy domain scores among South Africans by select socio-demographic variables

	Financial Control		Financial Planning		Product Choice		Financial Knowledge	
	Mean	ANOVA Prob > F	Mean	ANOVA Prob > F	Mean	ANOVA Prob > F	Mean	ANOVA Prob > F
Gender		*		*		**		**
Male	59		54		49		58	
Female	57		52		47		55	
Marital Status		***		***		***		**
Married	67		60		53		58	
Divorced/Widowed	62		53		47		53	
Never Married	52		49		46		57	
Age Cohort		***		***		***		**
16-19 years	43		40		41		54	
20-29 years	52		51		47		58	
30-39 years	62		57		52		55	
40-49 years	63		57		50		57	
50-59 years	64		57		51		58	
60-69 years	65		58		46		54	
70+ years	64		55		43		49	
Population Group		***		***		***		***
Black African	54		51		46		54	
Coloured	60		49		47		58	
Indian	71		65		61		70	
White	76		68		61		69	
Educational Attainment		***		***		***		***
Junior Primary and Below	50		43		36		39	
Senior Primary	56		47		41		48	
Incomplete secondary	53		48		44		54	

Matric or equivalent	59	57	52	63
Tertiary	73	72	66	69
Employment status	***	***	***	***
Other labour Inactive	58	51	43	53
Employed	67	63	57	62
Unemployed	48	45	42	51
Student	44	42	41	58
Retired	64	59	48	58
Monthly household income per capita	***	***	***	***
≤R499	50	45	41	50
R500-R1499	57	54	48	58
R1500-R4999	67	63	57	65
R5000-R9999	75	73	63	68
R10000+	78	78	70	75

Source: South African Social Attitudes Survey (SASAS) 2011
Notes: 1. The data is weighted to be nationally representative, and 2. A high mean score indicates greater financial literacy.

Multivariate Results

In order to comprehensively test the hypotheses outlined in this paper, a linear regression analysis was conducted on each of the four domains. A high coefficient indicates a high score on the domain and the results are depicted in Table 6. We find that the variables chosen to be included in our regression analysis offer strong explanatory power for the domain scores. The adjusted R-square on the financial control and financial planning is 0.35 and was 0.30 for product choice. However, the adjusted R-square was significantly lower for the financial knowledge domain (0.23) suggesting that the variables explain the knowledge domain less well than they explain the other domains.

As could be expected given the results of the bivariate analysis, the results of the multivariate clearly indicate support for the first hypothesis with economic status and labour market position emerging as strong predictors on all domains. However, the salience of labour market position was less than expected on the financial knowledge domain and the anticipated relationship was not observed. Although being unemployed had a negative impact on financial knowledge, the employed were not found to more financially knowledgeable than students or retired individuals. Geographic location also had an impact on the product choice and financial knowledge domains. Rural individuals, particularly those in traditional authority areas, were found to be less likely to score high on these domains. In a country where peripheral rural regions are often isolated from financial institutions and markets this finding may not be surprising.

Educational attainment was found to be a strong predictor on all financial literacy domains, confirming the second hypothesis. Holding a tertiary qualification had a far greater positive effects on the financial control (and to a lesser extent on the) financial planning and product choice domains than a completed high school education. This seems to indicate the existence of nonlinearities in the relationship between education and these domains. Controlling for a range of socio-economic variables, age was found to be a significant predictor of financial control and financial planning but not product choice and financial knowledge. Using the 16-19 age cohort as a reference, the multivariate results in Table 6 show a clear linear relationship between age and financial control with age positively correlated with financial control and financial planning. An inverse U-shaped age profile was not found on any of the domains and the third hypothesis could not be proven.

Table 6: Linear regression of financial literacy domains, 2011

	Financial Control		Financial Planning		Product Choice		Financial Knowledge	
	Coef.	Sig.	Coef.	Sig.	Coef.	Sig.	Coef.	Sig.
Gender								
Male	Ref.		Ref.		Ref.		Ref.	
Female	1.38	n.s	1.07	n.s	0.75	n.s	0.51	n.s
Geographic type								
Urban formal	Ref.		Ref.		Ref.		Ref.	
Urban informal	-1.72	n.s	2.78	n.s	-0.54	n.s	1.38	n.s
Traditional Authority Areas	-1.21	n.s	4.08	**	-1.93	*	-5.21	***
Rural Farms	-0.31	n.s	1.95	n.s	-3.68	**	-3.74	*
Marital status								
Married	Ref.		Ref.		Ref.		Ref.	
Divorced/Widowed	-1.66	n.s	-3.04	*	-2.75	*	-0.55	n.s
Never Married	-3.69	**	-3.48	**	-3.01	**	3.13	*
Age cohort								
16-19 years	Ref.		Ref.		Ref.		Ref.	
20-29 years	4.30	*	5.01	*	-1.39	n.s	-2.11	n.s
30-39 years	10.23	***	7.52	**	-0.43	n.s	-4.94	*
40-49 years	8.91	***	7.24	**	-1.28	n.s	-2.76	n.s
50-59 years	11.99	***	7.66	**	0.68	n.s	0.10	n.s
60-69 years	18.28	***	9.93	**	-2.15	n.s	-1.69	n.s
70+ years	20.60	***	8.82	*	-5.32	n.s	-8.33	*
Population group								
Black African	Ref.		Ref.		Ref.		Ref.	
Coloured	3.65	*	-4.03	*	1.06	n.s	1.85	n.s
Indian	-0.72	n.s	-0.78	n.s	1.82	n.s	2.77	n.s
White	4.03	*	-0.22	n.s	0.97	n.s	6.89	**
Educational attainment								
Junior Primary and Below	Ref.		Ref.		Ref.		Ref.	

	(1)		(2)		(3)		(4)	
Senior Primary	6.58	**	6.58	**	3.21	*	9.43	***
Incomplete secondary	11.06	***	11.06	***	7.12	***	13.81	***
Matric or equivalent	15.63	***	15.63	***	12.03	***	20.82	***
Tertiary	20.99	***	20.99	***	18.47	***	19.64	***
Employment status								
Other labour Inactive	-6.88	***	-4.80	*	-6.94	***	1.49	n.s
Employed	Ref.		Ref.		Ref.		Ref.	
Unemployed	-10.99	***	-9.64	***	-9.12	***	-3.23	**
Student	-10.05	***	-11.46	***	-11.09	***	-2.74	n.s
Retired	-11.15	***	-1.14	n.s	-3.54	*	2.64	n.s
Monthly household income per capita								
≤R499	Ref.		Ref.		Ref.		Ref.	
R500-R1499	2.26	*	3.60	**	2.32	**	3.72	**
R1500-R4999	6.70	***	8.52	***	5.89	***	5.76	***
R5000-R9999	8.23	***	14.37	***	8.05	***	5.45	*
R10000+	9.08	**	17.94	***	12.72	***	10.38	**
Constant	43.56	***	33.70	***	37.19	***	42.12	***
Number of observations	2001		2106		2106		2106	
Adj. R-squared	0.30		0.30		0.35		0.23	

Source: South African Social Attitudes Survey (SASAS) 2011

Notes: 1. The regressions also control for province of residence, 2. The data is weighted to be nationally representative, and 3. Positive coefficients indicate a high domain score.

The bivariate analysis pointed to the existence of racial differences on the financial literacy domains. Such observed differences could be the result of the quintessential blurring of race and class that so characterises South African society. This seems to be true of the financial planning and product choice domains where race was not a significant predictor. Racial identity was only weakly correlated with the financial control domain. However, even when controlling for a range of socio-economic variables, white South Africans were found to be significantly different from their non-white counterparts on the financial knowledge domain. This may suggest that race is acting as a proxy for culture. Alternatively this finding may indicate the existence of racial prejudice in South African education systems. Finally the fifth hypothesis could not be proven. Gender was not a significant predictor on any of the domains and no evidence of gender basis was found. This seems to indicate that gender differences in financial literacy in the country are the result of gender-based differences in access to education and wealth. Interestingly, marital status was found to be a significant determinant on all domains, expect on the knowledge domain. Those who were married were found to score higher on the financial control, product choice and financial planning domains. This finding could be explained if we allow that marriage may encourage more responsible behaviour and cause individuals to be more forward thinking.

Discussion and Conclusion

The increasing diversification of financial products on offer in the country has complicated financial decision-making for ordinary South Africans. The growing complexity of this environment has implied that enhanced financial understanding and awareness by consumers is essential. The South African economy is still recovering from the 2009 financial recession and the nation's financial institutions are struggling to sustain robust economic growth in a difficult global market. Our results suggest that a substantial proportion of the country's population may not be adequately equipped to make sound financial decisions. Certain groups, such as the poor and the uneducated, were found to be particularly vulnerable as a result of financial illiteracy. These results highlight the need for targeted interventions and consumer education programmes that will incrementally promote financial inclusion and improve awareness of financial products and services. The forthcoming national consumer financial education strategy must, therefore, establish a set of differentiated and adaptive interventions that target such groups.

In summation, three of the hypotheses constructed for this study could be proved and two could not. Across all domains created for this paper, a clear class and human capital bias was evident. Those in the upper economic classes and those with high educational attainment were far more likely to have high financial knowledge and positive financial behaviour. Therefore we can acknowledge the central importance of individual access to economic and human capital in understanding financial literacy in South Africa. Differences in terms of class and education seem to explain some of the observed racial group differences noted in the bivariate analysis. However, the multivariate analysis suggests that even controlling for all other factors related to economic and human capital position, race still plays a salient role in determining financial knowledge. More in-depth research is needed to understand if this finding is related to cultural differences between ethnic groups in South Africa or the existence of prejudice in financial institutions and markets.

Periodic, multidimensional evaluations of financial literacy are required in order to identify target groups and their changing needs, as well as monitor the cumulative effect of interventions directed at producing a more financial capable citizenry. This paper has argued that multidimensional evaluations of financial literacy are required in order to identify target groups and their changing needs. The use of the INFE OECD framework in South Africa provides a good example of what can be achieved. The work completed here provides a platform to recognise and appreciate the complexity of the financial literacy in the context of the modern period. This paper has shown that the financial domain scores, designed by the OECD, are an important instrument that can be used to successfully capture the many multidimensional aspects of financial literacy. We have shown that the INFE OECD measures constitute a powerful tool to understand and measure financially literacy in a developing country. Such a tool can used to identify financial vulnerable groups and provide a context to campaign for greater consumer education. Such measures are vital to the growing body of literature on financial literacy and a wide application of these instruments will provide a rich and comparative source of data on financial literacy.

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