

Demographic determinants of financial literacy in the Masvingo Province of Zimbabwe¹

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ABSTRACT

Financial literacy has been acknowledged as a key skill for individuals who are entrenched in a progressively composite financial setting. Financial literacy helps individuals make more self-assured and proficient decisions in their lives. That there is a nexus between a financially literate populace and economic growth can never be in doubt. Notwithstanding its importance, many studies specify that much of the world's population writhes from financial illiteracy.

This study has as its central theme in developing a logistic regression model that explains the influence of demographic factors on financial literacy levels. The study made use of cross sectional data collected from 260 respondents all from Masvingo province, Zimbabwe. This study analyzed the influence of demographic variables, which include age, household income, educational levels, gender and geographical location on financial literacy in Zimbabwe.

The study confirms age and educational levels as significantly influencing financial literacy. However, the study found out that geographical location, income and age do not influence financial literacy in Zimbabwe. Based on the results, the study recommends that financial literacy centres be opened by all banks with focus on the spread of financial literacy, to create awareness about financial products and provision of counselling facilities for customers of banks.

Key phrases: demographic variables; financial literacy; logit regression model; multi-currency era

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1. INTRODUCTION

The banking sector and financial industry at large has been advancing technologically and coming up with complex financial products for the past decades. Despite these innovations, the intended consumers of these products are rarely indicating significant interest in the same. The slow uptake of financial products and services could be as a result of financial illiteracy which is influenced by demographic factors such as age, gender, living standards income, education and geographical location. The level of financial literacy significantly affects investment and financial decision making thereby affecting the economic well-being of the participants and the whole economy at large.

In low income African countries such as Sudan, Kenya and Uganda, financial literacy is limited, resultantly complex financial consumer products are typically accessible only to a small percentage (Lisa & Bilal 2012: Miller, Godfrey, Levesque & Stark2009), noted that developing countries have low levels of financial literacy as indicated, for example, by half of farm labourers surveyed in India who store their cash at home. Financial Scope Botswana Report(2009) shows that financial literacy in most emerging economies is still very low, with 11% of the population in Tanzania using formal financial services, 23% in Zambia, Mozambique 11%, Malawi 26% and Kenya 41%. According to Gono (2013), Zimbabwe's financial literacy rate has been recorded at 40%.

Financial literacy in Zimbabwe has recently gained the attention of financial institutions, government agencies, grass-roots consumers and community interest groups. Interested stakeholders are concerned with the fact that consumers lack working knowledge on financial concepts and do not have the tools they need to make decisions most expedient to their economic and financial well-being. Such financial literacy insufficiencies have been morbid to the financial system and proved hurtful to the Zimbabwean economy at large. As such, it becomes necessary to expose the demographic factors which affect financial literacy in developing nations such as Zimbabwe. The results of this study will go a long way in aiding interested stakeholders and policy makers when designing their outreach programs to enhance and improve financial literacy among citizens.

2. LITERATURE REVIEW

Financial literacy is the ability of one person to understand and make use of financial concepts according to Lusardi & Mitchell 2014. In support of this, PISA 2012 defined financial literacy as the knowledge to understand financial concepts and risks. This knowledge includes the basic components of financial products and services for

example insurance policies, and pensions schemes. PISA 2012 went on describe financial literacy as the skills, confidence and knowledge an individual possess in order to make effective decisions on different financial contexts in order to better their financial well-being and the society at large. These skills include the ability to compare information, extrapolate and evaluate information in the financial context. Hastings, Madrian, Skimmyhorn²⁰¹³ referred to financial literacy as the knowledge one has on financial products and concepts and also the mathematical skills of numeracy required for making sound financial decisions and being involved in activities like financial planning.

Calvet, Campbell & Sodini²⁰⁰⁹ noted that financial literacy is the ability individuals have in their understanding of how money works, how to manage money, how to invest money in order to turn it into more. It had been discovered that financial knowledge was regarded as the ability people have to take necessary actions on issues which affect their financial wealth and financial well-being. Financial knowledge together with financial attitude are considered to be the base for financial literacy.

2.1 Importance of financial literacy

Research proved that the financial industry is very complex and it is difficult for those who are financially illiterate to comprehend. With the innovations made in this sector, the uptake of financial products and services became even more complex as it requires some evaluations and effective comparisons to be made amongst different banks and financial institutions (Lusardi & Mitchell ²⁰¹³). The deregulation of the financial industry made it impossible for the financially illiterate to make distinctions between different financial products and services. Most service offered by banks are similar and it requires some in-depth knowledge for clients to make some distinctions (are they will be slight). Customers are sometimes seen consuming expensive products and services because they lack that ability to make comparisons which can only be achieved by the financially literate.

The level of financial literacy impact on financial decisions and financial behavior of the market participants. Van et al ²⁰¹¹, Yoong ²⁰¹¹ and Guiso & Japelli ²⁰⁰⁸ argued that financial literacy bring about portfolio diversification, adequate participation in the stock market and planned retirement. Lusardi & Tufano²⁰⁰⁹ are of the opinion that financial illiterate clients engage in baseless financial practices, ponzi schemes and irresponsibly manage their finances. On the same notion, the financially illiterate have a tendency of investing in actively managed funds disregarding high management fees and ignoring the fact that actively and passively managed funds realize equivalent returns. This

argument was supported by Moore 2003 who noted that borrowers who are financially illiterate usually buy high cost mortgages and indulge in dubious money schemes.

Miller et al 2009 argued that financial literacy help improving the quality of financial products being provided by financial institutions. Individuals who are financially knowledgeable can exert constructive pressure on financial institutions such that they end up developing products which meet customers' desires, at competitive prices. In support of this, OECD (2005) argued that financial regulators are bound to produce quality and efficient services when they are dealing with an educated lot.

Financial literacy benefits not only individual clients but also financial service providers. According to Lusardi et al (2007), financially literate individuals pose little or no risk to financial institutions as they are able to use financial services and resources responsibly. This will in turn help stabilize the financial market in the long run and will lead to an increase in economic growth and gross domestic product of the nation, other things being equal. Hilgert et al. (2009) supported this view noting that when information asymmetry exists between consumers and financial service providers, there are higher chances of weak, unsound and unstable financial markets.

2.2 Key demographic factors affecting financial literacy

Among a myriad of factors which determine the level of financial literacy, this section is limited to reviewing only the demographic aspects. Lack of formal education has been nailed as one of the major reasons behind low levels of financial illiterate. In a survey by Hilgert, Hogarth, & Beverly 2003, educational levels impacted more on financial literacy. Atkinson & Messy 2012 who advocated for youth financial education, argued that individuals who did not go through post-secondary education are the ones who are likely to be financial illiterate.

On the contrary, Courchane 2005, concluded that education is not significant in determining financial literacy levels. Same conclusions were made from a survey by Lusardi and Mitchell (2008) who observed that some people with low levels of education scored high on financial questions and this showed that even those with little education can be financially literate. Given that Zimbabwe command a high literacy levels in Africa (at 90.1%) analysing the effect education on financial literacy becomes paramount.

Income level is another factor which might determine financial literacy. Income levels generally affect the household's living standards and social well-being. High income earners are better placed in terms of ability to attend financial seminars and furthering

their education. Previous study has proved that low income earners have the low levels of financial literacy (Braunstein & Welch 2002; Jacob et al 2000).

Same conclusions were made by Lusardi (2012) and Hastings & Mitchell (2010) who noted that in certain cases, financial literacy is low among those individuals with little education, low income earners and young in age. Guiso & Jappelli (2010) in agreement with Lusardi and Mitchell (2011) noted that income, and gender significantly impact financial literacy. According to Lisa & Bilal (2012) financial literacy is high among low and moderate income earners. Banks have a tendency of discriminating low income communities, (Anderson & Gryzlak 2012 & Cancian 2001). For example, banks are neither located in small towns nor have they tried to cater for the financial needs of low income earners. This unavailability of financial services to such communities amplify and preserve the level of financial illiteracy. Zimbabwe is a low-income earner whose economic growth has been sluggish and informal for the past one and half decades. Unemployment levels are very high and majority of the citizens are unbanked. Given these critical aspects, it is the aim of this paper to expose the effect of income levels on financial literacy.

Financial literacy is also a function of age groups. Naturally we cannot expect to find many teenagers or senior citizens who are financially literate. Lusardi, Mitchell & Curto (2008) discovered that half of the Americans aged fifty and more cannot answer two questions on simple interest and inflation. Same authors highlighted that the young aged (between 20 and 30 years) lack financial literacy. In an analysis made in 2008 by the National Longitudinal Survey of Youth, it has been discovered that financial literacy is lower among young adults.

However, Bhushan et al (2013) disagreed with the above authors as they argued that age and financial literacy levels are not significantly related. Zimbabwe is enshrined richly with all age groups, though their academic and economic exposure is different. It becomes increasingly necessary to ascertain the effects of age on financial literacy.

Most reviews show strong regional differences in financial literacy, as shown by awareness of financial terms and institutions, mainly amongst urban and rural areas. The same differences can be noted among urban dwellers considering their suburb location (high or low density). In Germany, the knowledge of basic financial concepts is lacking among women, the less educated, and those living in East Germany (Reed 2008). In particular, those with low education and low income in East Germany have low financial literacy compared to their West German counterparts. Interestingly, there is no gender disparity in financial knowledge in the East.

Inherited gender imbalances in terms of education, income and employment opportunities, affect financial literacy to a large extent. In a research by Lusardi & Mitchell 2008 and Bernheim 2009, gender was found to significantly determine the levels of financial literacy. They discovered that men are more financially knowledgeable compared to women, other things held constant.

Given the divergent views and conclusions on the demographic determinants of financial literacy, this study aims to ascertain the same in Zimbabwe under the multicurrency era. The multi-currency era has forced every citizen appreciate some financial concepts. The results of this study will go a long way in aiding policy makers and financial institutions when designing their outreach programs to enhance and improve financial literacy among citizens.

3. METHODOLOGY

In carrying out this study, logistic regression model was adopted considering the fact that the dependent variable is categorical (contains binary responses). The steps or procedures followed in estimating such a model are discussed below.

3.1 Data sources and variables

The study made use of cross-sectional data collected from 260 respondents all from Masvingo province, Zimbabwe. Financial literacy was the dependent variable explained by demographic elements namely: gender, age, income, geographical location and educational status.

3.2 Multi-collinearity tests

One of the key assumptions under logistic regression is that the independent variables are not significantly linearly related; meaning there is no statistically significant multi-collinearity among variables under study. Our regressors are likely to be linearly correlated. For example, educational levels tend to determine the level of income and whether the individual resides in high or low-density suburbs. The same can be said on gender and age which, in one way or the other affect other explanatory variables.

In testing the presence of this phenomenon, a researcher can make use of the Tolerance (TOL) and Variance Inflation Factor (VIF) measures. If TOL is less than 0.1 or the VIF is above 10 then multicollinearity is present and corrective measures should be harnessed to avoid type two error and other effects of significant multicollinearity. The two metrics are computed as follows:

$$TOL_j = 1/VIF_j = 1 - R_{ji}^2 \text{-----}(1)$$

and

$$VIF_j = 1/1 - R_{ji}^2 \text{-----}(2)$$

Where j and i are the variables under consideration and R^2 is the coefficient of determination. When $R_{ji}^2 = 1$ then $TOL = 0$ indicating the presence of significant multicollinearity. Spearman's correlation can also be used to determine the level of collinearity among predictors. A coefficient above .80 is an indication of significant multicollinearity.

3.3 Logistic regression model

Given the nature of the variables under study, in which case the dependent variable is dichotomous or binary (financial literacy), the usual Ordinary Least Squares (OLS) estimator is not applicable. If OLS is applied on a qualitative dependent variable (as in this case), the size of the effects of predictors is seriously miss-estimated, standard errors will be wrong and all the standard inferences are unjustified.

Apart from that, logistic regression is often considered an attractive analysis because it does not assume normality, linearity, or homoscedasticity (key assumptions required under OLS). Such assumptions are violated as you cannot have a normal distribution when the residuals are only free to take on two possible values (1 and 0). The homoscedasticity assumption is also likely to be violated since the variance of a dichotomy is pq (where p = the probability of the event occurring and q is the probability of it not occurring). Unless p is the same for all individuals, the variances will not be the same across cases (Williams 2015).

Logistic models estimate the probability of the dependent variable Y being equal to 1 (success) and in our case the odds of being financially literate. Under the logistic setting, odds of an event are the ratio of the chances that an event will occur to the probability that it will not occur. For example, if the probability of an event occurring is p , the probability of the event not occurring is $(1-p)$. Then the respective odds is a value given by

$$\text{odds of an event} = p/1 - p \text{-----}(3)$$

For correct coefficients interpretations under logistic regression, we model the natural log odds as a function of the predictor X , as follows:

$$\text{logit}(y) = \ln(\text{odds}) = \ln\left(\frac{p}{1 - p}\right) = \alpha + \beta X \text{-----}(4)$$

Taking the anti-log of equation (4) on both sides, (Hyeoun-Ae 2013) an equation for the prediction of the probability of success can be derived as:

$$p = P(Y = success|X = x, aspecificvalue)$$

$$= \frac{e^{\alpha + \beta X}}{1 + e^{\alpha + \beta X}} = \frac{1}{1 + e^{-(\alpha + \beta X)}} \text{----- (5)}$$

By extending the simple logistic regression to include multiple predictors, (in our case, education, gender, income, residential location and age) equation (5) becomes:

$$\frac{1}{1 + e^{-(\alpha + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_k X_k)}} \text{----- (6)}$$

‘Exponentiating’ a beta parameter provides the multiplicative effect of that predictor on the odds controlling other variables. As such, the study adopted multiple logistic regression model (sometimes referred to as logistic regression or logit mode) which estimates the probability of occurrence of an event by fitting data to a logistic curve (using Maximum Likelihood estimator) as postulated by Hyeoun-Ae (2013).

4. RESULTS ANALYSIS AND DISCUSSION

In exposing the demographic factors which affect financial literacy in Zimbabwe, the tests hereunder were utilized.

4.1 Multi-collinearity levels

As already indicated, logistic regression assumes that there is no perfect multi-collinearity among regressors. The study made use of Spearman’s correlation coefficient measure which is a non-parametric test. The results are shown in Table 1:

TABLE 1: Spearman’s correlation coefficients

	Age	Income	Education	Gender	Location
Age	1				

Income	0.075	1			
Education	0.039	0.06	1		
Gender	-0.0030	0.029	0.46	1	
Location	0.074	0.033	0.046	-0.0046	1

Source: Calculated from survey results

As can be seen from the table, multi-collinearity is absent as the bivariate correlation coefficients are less than absolute 0.8. Such results are expected in Zimbabwe where most of the educated young adults are still unemployed (therefore not likely to earn much if at all). Correlation between age and income is positive though small. This is expected to some extent, as an individual increases in age his chances of promotion and making some investments increases, other factors held constant. Same relationship was established between income and location. Correlation between gender and location is very small as expected. The same applies for gender age.

4.2 Omnibus test

The omnibus tests of model coefficients are presented in Table 2 below. The test assesses whether adding predictors to the constant only model (indicated block) increased our ability to predict the dependent variable.

Table 2: Omnibus tests of model coefficients

		Chi-square	df	Sig.
Step 1	Step	40.934	5	.000
	Block	40.934	5	.000
	Model	40.934	5	.000

Source: Calculated from Survey Results.

As the p-value of our model (indicated model) is less than 5%, the predictors used in the model significantly increased our ability to predict financial literacy.

The model summary in Table 3 and the Hosmer and Lemeshow test in Table 4, both measure the goodness of fit of our model.

4.3 Model summary

Table 3: Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke Square	R
1	284.736 ^a	.146	.204	

Source: Calculated from Survey Results.

a) Estimation terminated at iteration number 5.

Since the indicated R-squares indicated in the above table (Cox and Snell and Nagelkerke) are pseudo, they are difficult to interpret, though they indicate the explanatory power of our model. The 2 log likelihood statistic of our model is significantly different from the block model figure (425.66) indicating that our predictors are doing a good job.

4.4 Hosmer and Lemeshow Test

Table 4: Hosmer and Lemeshow Test

Step	Chi-square	Df	Sig.
1	2.433	8	.965

Source: Calculated from Survey Results.

Looking at the Hosmer and Lemeshow test, we fail to reject the null hypothesis indicating that our model can predict financial literacy significantly.

4.5 Logit output

Table 5 below shows the estimated logit coefficients whereby financial literacy was the dependent variable.

Table 5: Variables in the Equation

	B	S.E.	Wald	Df	Sig.	Exp(B)	95.0% C.I. for EXP(B)	
							Lower	Upper
Age	.010	.010	.975	1	.324	1.010	.991	1.029
Income	.003	.001	23.310	1	.452	1.003	1.002	1.004
education(1	.543	.294	3.398	1	.005	1.720	.966	3.063
gender(1)	-.070	.289	.058	1	.039	.933	.529	1.643
location(1)	.547	.290	3.557	1	.059	1.729	.979	3.054
Constant	-2.069	.694	8.898	1	.003	.126		

a. Variable(s) entered on step 1: age, income, gender, location education,

Source: Calculated from Survey Results.

In this study, age does not significantly affect the level of financial literacy noting that the p-value is way above 5%. As the odds ratio is close to one (1.010) and the estimated coefficient not significantly different from zero (0.010) the odds of financial literacy are equal on all ages. This is contrary to conclusion made by Lucarchi et al. (2008) who noted that age significantly affect financial literacy levels. Our results concur with findings made by Bushan et al. (2013). This is expected given the economic conditions which the nation was under for the past decade. The political and financial constraints hindered many from attaining tertiary education where financial literacy concepts are taught, which the young generations is now accessing.

Income, like age, does not significantly affect financial literacy level (p-value greater than 5%). All income groups have equal chances of being financial literate (indicated by a coefficient of 0.003 and odds ratio of 1.003). This is expected in Zimbabwe where the informal sector is the source of income for most households. As such earnings can be generated through legal and illegal means ignoring the formal channels where some sort of financial literacy is required to prosper. Informal sector includes the unregistered small to medium enterprises, cross-border traders and back-yard economic activities which rarely require much financial literacy to thrive. Our results are contrary to conclusions reached by many authors including Braunstein & Welch (2002), Lusardi 2002 and Jacob et al.2000.

A p-value of 0.005 indicates that educational level significantly affect financial literacy. An individual with a degree and above is 0.543 times more likely to be financial literate compared to the one with lower qualifications. Thus, as education levels increases, the odds of somebody being financial literate rises. In fact, as the level of education increases, the odds of being financially literate increases by a factor of 1.720 or 70%, other factors held constant. This is driven mainly due to the introduction of entrepreneurship courses in most academic programs in most higher and tertiary education institutions. Our findings are in agreement with conclusions made by Hilgert et al 2003 and Atkinson & Messy 2012, but are contrary to what Lusardi & Mitchell 2008 noted.

Gender tends to affect financial literacy significantly as its corresponding p-value is less than 5%. This is in line with the findings made by Bernheim 2009&Guiso&Jappelli 2010. As females were coded 1, their odds of financial literacy increases by a factor of 0.933 compared to males (which is a decrease effectively). This actually means the odds of being financial literate falls by 6.7% to females in Zimbabwe. This effectively indicates that the odds of being financially literate increase for males. This can be due to gender imbalances, in which case females were actually 'second citizens' in terms of economic activity, education and income level. Thanks to the new era advocating for equal opportunities among males and females world over, including Zimbabwe.

Financial literacy is not significantly a function of residential area at 5% level of significance. Naturally, income determines the preferred residential area to a large extent. In which case, in Zimbabwe, such income is not related in any way to either education or employment status. At 10% significance level, low density suburbanites tend to be more financially literate by a factor of 1.729 compared to other areas, other factors held constant. This is contrary to the findings made by Loprest 2001 and Cancian2001 who noted that geographical or residential location determines the level of financial literacy.

6. RECOMMENDATIONS

In light of the above, the following recommendations are made to the Reserve Bank of Zimbabwe (RBZ) and other stakeholders to promote financial literacy as under:

- **RBZ financial literacy website.** A link on financial education in the RBZ website, containing material in English, Shona, Ndebele and the rest of other vernacular languages, which includes comic books on money and banking for children, films, messages on financial planning and games on financial education.
- **Financial Literacy Centres (FLCs).** These may be opened by various banks with focus on the spread of Financial Literacy, to create awareness about financial products and provision of counseling facilities for customers of banks.
- **Outreach visits** by employees of Reserve Bank of Zimbabwe to remote villages. The objective of these visits is to understand the ground level position, spread awareness about benefits of being connected to the formal financial system and disseminate information about the functioning of RBZ.
- **Awareness** is done by distributing pamphlets, comic books, enacting plays and skits, arranging stalls in local fairs, exhibitions, participation in information / literacy programmes organized by press as well as releasing books on financial planning for students and new professionals.
- **Setting up of a monetary museum** by RBZ to create awareness about money and banking among the general public and spread knowledge about the history of money.
- **Mass media campaign** tie ups with educational institutes, financial awareness workshops/ help lines, books, pamphlets and publications on financial literacy by NGOs, and financial market players.

5. CONCLUSIONS

The concept of financial literacy centres on key lessons for financial decision-making, it explores how people can enhance their skills and abilities to make more informed economic choices. In the absence of increased financial literacy, people will be increasingly at the threat of making poor financial decisions which will leave them to confront financial hardships, including an uncertain old age. Thus financial literacy plays a significant role in influencing accountable attitudes and behaviours with regard to the administration of personal finances and this translate to a successful adult life.

The results of the research ratify preceding expectations and previous readings, by pointing out: women as having lower financial literacy levels (Chen & Volpe 2002,

Lursadi & Mitchell, 2011, Mottola 2013) and individuals with lower educational levels (Lursadi & Mitchell, 2011) having low financial literacy rates. Residential location and age were found to be insignificant in determining financial literacy. This concurs with the conclusions made by Lisa & Bilal 2012).

In Zimbabwe, income and financial literacy rate are not significantly related since the source of household income is largely informal. The relationship between these two variables is likely to be bi-directional. Financially literate individuals tend to make optimal financial decisions which increase their income. On the other hand, individuals with high income are capable of attending financial seminars and even further their education with ease while on one hand and on the other hand financially literate can generate more income.

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