

Financial Health of Women: A Poisson Regression Analysis Approach

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Abstract Financial health of women is crucial as it enables them manage their financial commitments, respond to short-term financial shocks and be financially resilient. There is a marked difference between the financial health or wellbeing of women living in rural and urban areas. This study analyzes the factors that influence the financial health of women in rural and urban areas in Kenya using the Poisson regression model. The study data is based on the FinAccess survey of 2019 conducted by Central Bank of Kenya, Financial Sector Deepening Kenya and the Kenya National Bureau of Statistics. A comparison is made between the key factors influencing the financial health of the women based on area of residence. The presence of overdispersion in the data meant the use of quasipoisson instead of poisson model in the data analysis. The findings is that women in urban areas are more financially healthy than those in rural areas. The risk coping, age, invest score, ability to manage day to day, vulnerability, area of residence, widowed as a marital status and completed university are significant in influencing financial health of the women.

Keywords: women, financial health, poisson regression, urban, rural

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1. Introduction

A financial healthy household or individual has ability to pay debt [1], and this tends to increase with increase in financial inclusion. Financial health is a state of being and not a set of behaviours that lead to that state. In other words, financial health is what you achieve, financial capability is what you do and financial literacy is what you know [2]. Financial health is also defined as financial wellbeing that includes satisfaction with material and non material aspects of one's financial situation [2]. Another definition is that financial wellbeing is the ability of people to manage their financial commitments without stress, meet their needs comfortably and with enough financial resilience to respond to short-term shocks [3]. In another sense, financial wellbeing is a feeling of being financially healthy, free from worries, based on subjective evaluations or perceptions of one's financial situation in present and future engagements [4]. The term financial health and financial wellbeing will be used interchangeably in this study.

The availability of financial products and services intended for the rural folks rarely benefit rural women and underserved groups. There is lack of data points not only for the rural women, underserved but also the women living in slum areas. If the data is available, it can enhance more inclusive financial system for women and inform the

supply-side of the market [5,6]. Women empowerment through financial inclusion is geared toward a better gender equality by improving their well-being for global progress through provision of affordable and appropriate financial services to the women [5]. The concept of financial health of consumers is a gauge of how well the financial service sector is meeting its population's financial needs [2]. Imaginative financial services and products design to cater for the marginalized women and men can cover the gap in formal financial services. There is a global awareness in the financial services access disparity between women in rural and urban areas. This has limited the rural folks in gender empowerment and financial inclusion [7].

In most economies, women are overrepresented as the unbanked even in countries with high financial inclusion. In Kenya, 20% of the adults are unbanked and about two-thirds of them are women. This trend is observed in China and India where 60% of the unbanked adults are women. In Bangladesh, 65% of the adult women are unbanked and Columbia has 56%. Those unbanked are concentrated among the poorer households, among women as well as men [8]. People are better able to manage financial risk when they can save money and access credit. A survey in 2017 by Findex found that 54% of the respondents globally can come up with an emergency funds of 5% of their income annually. This is not only influenced by income but also the cultural differences across economies [8]. The acceptance of risk and return defines the

investment behaviour differences from individual to individual. In the 1990s, a survey in the United States found that women spend 40% more time performing research on mutual funds and less confident in investing abilities as compared to men. Women are less impulsive with 56% feeling more confident about their investing abilities compared to 64% of the men [9].

Financial health of an individual can have a deeply emotional component, just like other aspects of a person's life. Subjectivity in attitude and perceptions are common and thus getting a clear overall picture is difficult [10]. An individual's financial wellbeing is influenced by many factors, both within and beyond that person's control - it is more of a game, with feedback from each interaction that influence each other resulting to an endowment, the financial health [2].

The ability of the financial providers to measure financial health of their customers enables them to truly engage them in their dreams and struggles [10]. Women face a myriad of challenges in financial access, and more emphasis to assist them is required as these challenges affect their financial health. Gender gaps exist in financial access and financial health with rampant gender disparity and social exclusion in the developing countries [5]. The societal set up means women particularly in rural areas spend more time with household activities and this limits their ability to engage in financial endeavors [6]. Lack of property means no collateral to access credit with no ability to build their credit history. These demand-side challenges are more profound in the rural women as compared to the urban women.

The goal of this study is therefore to identify the factors that influence the financial health of women in rural and urban areas in Kenya using Poisson regression. We found no similar study on the financial health of women in urban and rural areas. In terms of contributions, this study stands out due to: use of Poisson regression to analyze factors that influence financial health of women in rural and urban areas, and enhance the scanty research in financial health of women.

2. Financial Health of Women

The economic, social empowerment and development of the household of rural women improves with access to finance [6]. The rural women being more limited in access to financial services due to economic, sociocultural, legal and even educational barriers like financial literacy. Financial institutions need to adopt sustainable and gender-sensitive practices to overcome both the supply-side and demand-side constraints of access to finance. Women empowerment in economic, social and political dimensions increases with financial inclusion. A study in India [5] observed that women in urban and slum zones have access to financial institutions but face economic, financial and social risks.

The credit risk of peer groups for men and women was examined [11] and found that women groups only tend to exhibit higher credit scores when compared to men only groups. Generally, women peer groups had lower credit scores variability and lower credit risk as compared to the men groups. This was evident even for the low income

earners segment of the respondents. A study on the investment attitude of women using factor analysis found that married women are more curious than the unmarried women. Young women were more likely to invest in shares, insurance, mutual funds and fixed deposits than the older women [9].

A literature review [1] from research on financial vulnerability singled out two studies. First one with six variables: age, occupation status, family type, gender, country and number of earners in the household. The conclusion, using cluster analysis, households that are vulnerable tend to be often in difficulties in the past twelve months, and feel that the situation might not improve. The second study considered the variables: economic, social and psychological factors. Financial vulnerability increased with increase in pervasive poverty among the households. As noted [7], to improve the rural women financial health, policy regulations and initiatives must be designed to correct the imbalances evident and not generate unintended negative consequences.

A conceptual model [2] indicates that financial health is an outcome of the socio-economic characteristics of an individual, their knowledge, skills and attitudes, habits, actions and other external factors like income. The role of income and financial health remain hotly contested by researchers. A survey by Financial Consumer Agency of Canada found that 23% of financial health variability was due to behaviour, 19% influenced by economic factors, 12% due to social factors, 12% to psychological factors and 4% to experience and knowledge [2]. A research to understand gender gap in financial wellbeing indicated that the gap may be preference based, market driven, social, cultural or otherwise, as experienced by men and women. On financial decisions, gender differences in risk have been demonstrated, with clear implications for financial outcomes [3]. In a study to develop eight indicators for financial health, the data points that measured customer variability were age, education level, income level, employment status, income volatility, risk tolerance, household composition, and goals/aspirations [10].

An hypothesis and financial health model was developed [12] to test variables like money management, income generation, risk management, prudent borrowing and investment, and access to professional guidance. The model assumed that enhanced financial literacy allows people to make better and more informed financial decisions. A weak link is observed between financial health and financial education as it is a multi-stage continuous process that produces financial health. The actual decision making process is informed by many factors like market conditions, product and service access, socio-economic status, and regulations, among others [12].

The Center for Financial Services Innovation developed eight indicators to measure financial health [10]. The indicators identified are: you spend less than your income, bills are paid in full and on time, have sufficient living expenses in liquid savings, you have long term savings or assets, sustainable debt load, a prime credit score, appropriate insurance and ability to plan ahead of expenses. The indicators were developed through a comprehensive process of deep industry research and expert consultations [10].

A study to analyze financial wellbeing and overall life satisfaction of low income individuals in a Bolsa Family Program in Brazil noted that the people in the sample are satisfied with life. The study variables are age, marital status, household size, house ownership, occupation, education level, income and type of occupation [4]. The observation was that the respondents with high life satisfaction and low financial wellbeing had precarious financial conditions from past due accounts and negative credit records. A promotion of rural women financial inclusion implies establishing and fostering essential enablers to inclusion. This is by setting concrete and quantifiable policy objectives to advance women financial health in rural areas [7].

A study on socioeconomic factors that influence credit usage show that males are less likely than their female counterparts as household heads to currently have credit [13]. The relative risk for currently have credit to never had credit of male head relative to female head decreased by a factor of 0.915, with other factors held constant. Based on this study, female household heads are more likely to currently have credit as compared to the male household heads.

In summary, the financial health of the women tend to increase with increase in credit access. This increases their social and economic empowerment. The role of income on financial health is hotly contested and thus not included in this study.

3. Methodology

We apply the Poisson regression to estimate the significant variables that influence the financial health of women based on area of residence as urban or rural. The response variable is the financial health count score and the nine predictor variables are: vulnerability index, invest score, risk cope, managing day to day, marital status, education, age, household size and residence. A summary statistics of the predictor and response variable is presented with residence as the grouping variable. The data is a combination of count (financial health, risk coping, household size and invest scope), continuous (age) and categorical variables (residence, manage day to day, vulnerability index, marital status and education level).

The study data is based on the FinAccess survey of 2019 which is a collaboration between Central Bank of Kenya, Financial Sector Deepening Kenya and the Kenya National Bureau of Statistics [14]. The survey targeted

respondents aged 18 years and above with sampling ensuring estimates at national, regional and residence level are included. The survey data can provide useful insights for decision making on financial deepening and greater inclusion in Kenya. Therefore, this data provides a good starting point for promoting evidence-based decision making process for the financial health of women in Kenya.

4. Data Analysis and Results

The financial health score count data overdispersion test showed the presence of overdispersion and the quasipoisson instead of poisson regression was applied in the R statistical software. Overdispersion occurs in circumstances when the observed variance of the response variable is larger than would be predicted by the poisson distribution.

In Table 1, the women in urban areas are on average more financially healthy (mean=3.77, SD=2.10) than the rural women (mean=2.84, SD=1.92). On the risk coping scale, urban women have a higher score (mean=1.32, SD=0.934) than rural women score (mean=0.997, SD=0.896). Women in urban areas are better in investments (mean=0.798, SD=0.893) as compared to rural women (mean=0.485, SD=0.724). The indicators show that urban women as compared to rural women are more financially healthy, better in investing and with ability to cope with risk. The average age and household size of the rural women is 41.4 years and 4.33, and the urban women is 35.4 years and 3.59 respectively. Thus, the sample from the urban area was younger with lower family size. The expectation would be that the rural women have elevated financial health having lived longer as compared to the urban counterparts, but the data is pointing to a different direction.

The ability to manage day to day for urban is 59.3% as compared to 44.9% for the rural women. An indication that women in urban areas are more financially healthy to deal with any financial challenges as compared to rural women. On the vulnerability index, the urban women are less vulnerable as compared to rural women. The most vulnerable are rural women at 11.1% and urban at 7.45% with least vulnerable being in urban at 72.3% and rural at 56.6%. Thus, rural women are more vulnerable than urban women and this is an indicator of the financial vulnerable position of women in rural areas. An increase in vulnerability decreases financial health.

Table 1. Summary Statistics for response and predictor variables

Variable	Rural			Urban		
	Mean	Standard dev.		Mean	Standard dev.	
Financial health	2.84	1.92		3.77	2.10	
Household size	4.33	2.29		3.59	2.09	
Age	41.4	18.2		35.4	15.0	
Risk coping	0.997	0.896		1.32	0.934	
Invest scope	0.485	0.724		0.798	0.893	
Manage day-to-day	Yes	No		Yes	No	
Percent	44.9	55.1		59.3	40.7	
Vulnerable	Most	Vulnerable	Least	Most	Vulnerable	Least
Percent	11.1	32.3	56.6	7.45	20.3	72.3

Table 2. A Poisson regression model analysis

	Estimate	Std. Error	t-value	Pr(> t)
(Intercept)	0.0603	0.0261	2.31	0.0208
Household size	0.0014	0.0018	0.74	0.4585
Age	-0.0009	0.0003	-2.93	0.0034
Risk coping	0.2989	0.0047	64.19	0.0000
Invest score	0.2407	0.0044	54.52	0.0000
Manage day-to-day – No				
Yes	0.4205	0.0104	40.54	0.0000
Vulnerability index - Most vulnerable				
Vulnerable	0.1312	0.0196	6.71	0.0000
Least Vulnerable	0.3261	0.0195	16.75	0.0000
Residence – Rural				
Urban	0.0158	0.0077	2.06	0.0398
Educational level – None				
Other	-0.0697	0.0733	-0.95	0.3421
Completed Primary	0.0162	0.0138	1.17	0.2414
Completed Secondary	0.0052	0.0149	0.35	0.7282
Some Primary	0.0231	0.0133	1.74	0.0816
Some Secondary	0.0253	0.0155	1.63	0.1037
Some Technical	0.0387	0.0259	1.49	0.1351
Some University	-0.0127	0.0311	-0.41	0.6838
Technical training	-0.0172	0.0180	-0.95	0.3397
Completed University	-0.0774	0.0210	-3.68	0.0002
Marital Status – Single				
Divorced/separated	-0.0203	0.0184	-1.10	0.2705
Married/Partner	0.0000	0.0093	0.00	0.9968
Refused to Answer	0.1280	0.1840	0.70	0.4869
Widowed	-0.0365	0.0162	-2.25	0.0246

In Table 2, age, risk coping, invest scope, managing day-to-day, vulnerability index, area of residence, having completed University education and being widowed had a significant influence on financial health of the women in rural and urban areas. If the respondent age increased by one year, the difference in the logs of expected counts would be expected to decrease by 0.0009 units ($p=0.0034$), while holding the other variables in the model constant. This is evident as the rural women mean age is 41.4 years with lower financial health as compared to the urban women mean age of 35.4 years with higher financial health. A unit increase in risk coping increased financial health by 0.2989 unit while invest scope unit increase increased financial health by 0.2407 unit with the findings being statistically significant ($p<0.001$). A unit increase in ability to manage day-to-day increased financial health by 0.4205 unit ($p<0.001$) for yes responses as compared to no responses, with those in urban areas having an increased financial health by 0.0158 unit ($p=0.0398$) higher than those in rural areas.

A unit increase in being vulnerable increased financial health by 0.1312 unit ($p<0.001$) while least vulnerable increased financial health by 0.3261 unit ($p<0.001$) as compared to the most vulnerable women. Thus, the more vulnerable, the lower the financial health as compared to be less vulnerable. If the respondent completed university, this decreased the difference in the logs of financial health by 0.0774 unit as compared to those with no education and the findings are significant ($p=0.0002$). Higher education does not significantly increase the financial health of women. An increase of being widowed decreasing financial health by 0.0365 unit ($p=0.0246$) as compared to the single

women. The possible reason could be loss of income that the widowed enjoyed before they lost their partner.

Therefore, an increase in risk coping mechanism, ability to invest and manage day to day finances increased the financial health of the women. The women in urban areas as compared to rural areas had a better financial health status. An increase in age reduce the financial health of the women. Single women had better financial health than widowed women which could be attributed to the household size while women with no education level had a better financial health than those who had completed university education level.

5. Conclusion

Financial health of women is crucial to enable them manage financial shocks on short or long term basis, financial commitments and ability to meet their financial obligations. The key factors that negatively influence financial health of women in rural and urban areas is age, University completion and being widowed. Risk coping, investment score, ability to manage day to day, vulnerability index, and area of residence had a positive influence on financial health of women. The women in urban areas have higher financial health as compared to their rural counterparts. This evidence points to the need for the women in rural areas to get more focused attention to increase their financial inclusion which increases their financial health. Future research can compare women and men financial health in rural and urban areas, as well as increasing the number of study variables.

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