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CONSUMER DECISION MAKING FOR RESIDENTIAL MORTGAGES

Sudeb Mitra
University of Colorado, Denver
Sudeb.Mitra@ucdenver.edu

Steven Walczak
University of Colorado, Denver
Steven.Walczak@ucdenver.edu

Abstract

The housing market is a key component of the US economy. Stability of the housing market and equity of residential property help to determine consumer confidence and their net worth. Confidence for homeowners is key to any consumer driven economy like that of the United States. However, a decade of low interest rate, lack of a basic credit standard, greed, and competitions among lending institutions created a housing bubble that eventually burst around the middle of 2007. This caused a severe financial meltdown in 2008. While other papers look at the meltdown from a financial market perspective, this paper will look into consumers' ability and biases towards selection of a quality mortgage. We examine various factors including educational background, risk aversion, investment self efficacy, and social position that influence consumers' ability to choose an appropriate mortgage. The results indicate that investment self efficacy has at least some impact on the quality of the mortgage decision.

1. Introduction

The US and world financial market meltdown in 2008 was triggered by the corresponding housing market collapse. Yandle [1] indicates that one of the main reasons behind this meltdown is involvement of uncertain risks associated with securities, in particular mortgage backed securities (MBS). The causes of the housing market collapse are many –decade long period of low interest rates for mortgages, low or no standard for credit resulting in low quality mortgages, fraud, and others. Previous research [2-4] has examined the financial market perspective of the meltdown; however few have researched the consumer decision making process. From the consumer's point of view, there are multiple criteria to consider. The main objective of most consumers is to minimize their overall perceived cost. However the perception of cost is itself a multi-cirteria value, including having a: lower interest rate (to reduce the cost of borrowing and increase disposable income), lower term (to reduce stress from indebtedness), cash availability and equity (ability to make loan payments), low or no initial deposit required, and no money down cash out option to extract accumulated equity. All of these criteria need to be carefully evaluated in making a mortgage financing decision. These various criteria may be further subdivided into costs of the mortgage and perceived quality of the mortgage (to fit the borrower's goals and life-style). Quality typically conflicts with the costs of the mortgage. However, consumers' choices of risky, unwanted, and unaffordable mortgages are a contributing factor to this meltdown. This paper addresses consumers' mortgage decision making processes, and subsequent decision quality from the consumers' perspective.

Mortgages are probably one of the biggest and most important financial transactions for many consumers in their lifetime. The consumer decision making process depends on numerous criteria and may vary based on the amount, terms, and type of transaction. US home ownership was around 67% at its peak. It is important to understand how and why consumers make decisions regarding their mortgage selection.

The main contribution of the paper is to determine factors or criteria that influence consumers' decision making processes such as: financial self-efficacy, cognitive bias, and risk taking attitude. We will also explore the impact of other factors including consumers' social position, educational background, and interest towards and knowledge of financial markets.

The housing market is the key to the overall economy. When the housing market collapsed around 2007, many considered the subprime market to be the catalyst for its downfall [5]. Crotty and Epstein [6] argued the meltdown was further precipitated by lack of oversight and inactivity by the federal government during the initial stages of this crisis.

When a buyer purchases a house, they typically initiate a mortgage with a particular interest rate, which depends on the buyer's credit score and income factors. Credit score is an important variable from the buyer's perspective. Mortgages are called subprime, Alt-A, and prime market based on credit score. These individual mortgages are grouped together to create MBS and sold in the secondary market to regenerate liquidity. This added liquidity is sold again to issue a new mortgage. The Veteran's Administration, Freddie-Mac, and Fannie-Mae support the mortgage market system by offering Federal Housing Administration (FHA)

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mortgages to all potential house owners. MBS can have a combination of mortgages from several different mortgage market segments. Since the start of the housing crisis, private investors have been reluctant to buy MBS because of lack of transparency of its composition and its associated risks. Their reluctance to buy MBS creates illiquidity in the secondary market, which is critical in supporting the housing market.

In order to provide liquidity to support the housing market, the federal government started spending money to buy mortgages by buying MBS from the market. These efforts came first in the form of the trouble asset relief program (TARP) and then in the form of quantitative easing (QE1 & QE2) by the Federal Reserve. These direct or indirect efforts by the Federal Reserve have resulted in lower, more affordable mortgage rates which helped a lot of potential home owners who otherwise would not have qualified for a conventional loan that required high credit scores and a higher down payment between 10%-20% of the house price to buy a house. We know some of the reasons for this downfall from lending institutions and the financial market perspective. But it is important to consider whether consumers choose a financial mortgage based on multiple criteria in their minds and the quality of decision regarding their own mortgage with full understanding of the consequences. It is also important to know how they evaluate the quality of their mortgage decision.

The rest of the paper is organized as follows. Section 2 summarizes related work to find constructs for quality of the mortgage decision making process from a consumer perspective. Section 3 describes the data collection and data analysis methods. Section 4 describes results and consequent refinement of the model. Section 5 concludes the study with limitation and future work.

2. Literature Review

Mortgage financing is one of the highest value transactions from a consumer's perspective. So, it is expected the consumer will make the decision with due diligence. However, the result of the financial and housing market meltdown contradicts that expectation. To understand consumers' decision making process, Dalal and Bonaccio [7] stated how decision-makers' react to alternatives and the approach they pursue. Consumers' preference to choose the right alternatives and recommendation is the key to a successful and correct decision. Consumers' social support also impacts decision accuracy and decision autonomy.

Vitt [8] describes how people make financial decisions and states consumer-financial decisions involve psychological, physical, and social values that are rooted in feelings and emotions. He states that consumer behaviors can appear as irrational and even irresponsible. Consumers should make a judicious decision particularly when it is of such a high value and which can impact their social, psychological, and financial life in a very decisive way in the long term. However, the perceived costs and benefits of the consumer decision making process are important to consider. Morrison & Vancouver [9] studied how perceived costs and benefits affect people seeking information across multiple types and sources of information using a within-person approach to data collection and analysis. Their results demonstrate that individuals selectively seek different types of information, and utilize different sources, based on assessments of corresponding costs and benefits. Hilton[10] reviews the seven deadly sins in individual decision-making showing how the financial decision-maker may fall prey to them. He also suggests how knowledge can be used in improving efficiency in financial strategy, marketing, and human resource management for selection, training, decision-aiding, and control.

Kuusela, Spence, and Kanto [11] studied how a stable factor affects decision making, focusing on expertise results in decision processes. Their study determines the effect of expertise on pre choice decision processes and final outcomes. They reviewed how individuals use brand-related information when making decisions varies depending on the stage in the decision process. When faced with complex decisions individuals often start by using relatively easy-to-execute, non-compensatory decision rules to reduce the awareness set to a smaller, more manageable choice set. Walczak and Fishwick [12] made similar cognitive economy enhancing techniques to improve decision making shown in more general zero sum game situations.

Sorce, Loomis and Tyler [13] studied the extent of the influence of adult children on the consumer decisions of their elderly parents regarding their influence on a recent purchase of their elderly parents and on the housing decisions of their parents. Two thirds of the adult children reported having at least a "fair" amount of influence on a recent decision of their parents.

3. Hypotheses and Constructs

Informed consumers depend on information from different resources and make their decisions based on from the source of the information and its corresponding reliability and trustworthiness. Decisions may be made based on the consumer's inherent bias towards their own trustworthy peer

influence, level of comfort, perceived cost associated to make the decision, expert opinion, and ease of execution, even if the decision may not be the best possible one.

Based on above discussion we hypothesize:

H1: Consumers' cognitive bias negatively influences the quality of mortgage financing.

Education, awareness, and knowledge of the financial tools available make consumers aware of financial pitfalls. The consumers' interest and eagerness to know make them to explore more financial tools. This awareness can potentially make a difference in the mortgage decision making process. Though formal education is not a sure indicator of successful and correct decision making regarding mortgage selection, it provides the knowledge base to consumers to make informed decisions or ask relevant questions. Araña and León [14] find that the number of years of education, and not personal income, are positively correlated with the probability of choosing a non-compensatory decision rule. They also noted by manipulating specific emotions (sadness, disgust), that emotions of the same valence can have opposing causal effects on the decision rule choice. Horton and Weidenaar [15] state that economic education improves our understanding and ability to identify, analyze and interpret the economic aspects of a mortgage. Comprehension of the economic realities of one's world enhances self-confidence and self-esteem [6]. Accordingly, both intellectual and emotional barriers are lowered for the making of rational individual decisions. Self-confidence and self-esteem are important in terms of consumers' ability and behavior to make a quality decision.

Individuals' personal knowledge of financial tools and exposure to the mortgage financing process enhances the ability to make a better decision. Penn [16] states that individuals have a particular interest in skill formation. Life changes, material and non-material well-being, are all a function of an individual's position within the occupational division of labor. Individuals are influenced by a variety of significant others, e.g., parents, siblings, friends. Trust and reliance on significant others may sometimes supersede the detailed analysis one would have gone through otherwise.

Similarly it is important to determine the right term for the mortgage or to evaluate whether paying points to reduce monthly payment makes sense or not. Lesseig and Fulmer [17] discuss the appropriate maturity of the mortgage and the number of points to pay to reduce the mortgage interest rate. They state that the mortgage-maturity decision must be part of an overall financial plan that considers long-term investing options, insurance needs, age, tax planning, risk and similar matters. Luna and Reid's [18] research proposes the use of a decision tree approach in mortgage selection. People choose mortgage types to minimize their costs, basing their decisions largely on expected future interest rates. They used a decision tree to help analyze this situation and generate the decision tree to help assess the economic consequences of various mortgage alternatives. Based on the above discussion we hypothesize:

H2a: Consumers' educational background positively influences decision making regarding mortgage financing.

H2b: Consumers' interest in financial tools and financial markets positively influences decision making regarding mortgage financing.

Consumers' social position may impact their ability to make better quality investment decisions. Flemming [19] shows how a person's social position may significantly influence his preference toward risk, and points out the value that a sociological perspective might have in developing theories of decision-making involving risk. He also indicates that social position may be strongly correlated with educational opportunity. Many research articles [20-22] consider racial discrimination and ability to access mortgages. Bostic[23] assesses cultural affinity as a potential explanation for observed racial disparities in mortgage rejection rates. He provided two aspects of the theory – the taste-based cultural affinity hypothesis which asserts that lenders have a blanket preference for members of the same race and the common bond hypothesis which asserts that cultural affinity allows lenders to better assess the credit quality of members of the same race. Social categorization theory supports the idea that social affinity is stronger between individuals with similar racial characteristics [24,25] and the similarity attraction paradigm supports preferences for similar social backgrounds [26].

Belch and Willis [27] evaluate husbands' and wives' influence in the family decision making and showed how it has changed over time. The changes may have affected the nature of decision making in the family. Based on resource theory, individual personal resources relative to others are the basis of power. Relative income, education, time availability, and social status are contributing factor to the power. Based on these discussions, we hypothesize:

H3: Consumers' social position positively influences the quality of the mortgage decision.

It is also important to consider consumers' ability, confidence, or propensity to take risk and their perceived investment self-efficacy. Forbes, James and Kara [28] surveyed potential sources of investing self-efficacy in a large sample of working adults. The effect of investment knowledge on belief in one's future capability of orchestrating a plan to achieve investment goals was mediated by confidence. Employees' applied investment knowledge accuracy was low, 57%, and investment knowledge was reliably related to confidence. However, confidence and investment knowledge accuracy were independent, implying an inability to inhibit poor investment decisions or an inability to exploit investment opportunities.

The self-confidence and self-efficacy of financial decision making also varies between genders. Endres, Lee, Chowdhury, and Alam [29] researched whether men are more confident than women in complex financial decision making. Two problems exist in their measurement of confidence bias - lack of theoretical basis and failure to adjust for measurement error. To address these limitations, they investigated men's and women's investment self-efficacy and personal goals as compared to their actual performance in a complex financial task. Men's investment self-efficacy and personal goals were significantly higher than women's.

In deciding which type of mortgage is appropriate or best for them, consumers' risk aversion and investment self efficacy is quite notable. Coulibaly and Li [30] examine the determinants of the choice between fixed and adjustable rate mortgages. The results from a logit model of mortgage choice indicate that pricing variables and affordability are important considerations. They also find that factors, such as mobility expectations, income volatility, and attitudes toward financial risk largely influence mortgage choice, with more risk-averse borrowers preferring fixed-rate mortgages. For households that are less risk averse, the mortgage type choice decision is less sensitive to pricing variables and income volatility, and affordability factors are not significant.

When consumers rely on their social support or significant others for important decisions like mortgage financing, the risk taking factor is moderated. Stone, Yates, and Caruthers, [31] examined people's level of risk taking when making monetary decisions for other people rather than for themselves. They experimented with the role of regret and their results show that regret concerns led to increased risk avoidance both when participants made decisions for other people as well as when making decisions for themselves. They found men were more risk seeking than were women in both situations. Their studies suggest that many of the findings from risk research on individual decision making regarding financial situations generalize to decision making for others

Risk-taking as an attribute or characteristic of personal preferences has been investigated extensively from both psychological and economic perspectives. Psychologists have asked whether risk propensity exists as a stable personality trait and how the tendency to take risks manifests itself across different domains of social and personal life. Lo, ,Repin, and Steenbarger, [32] research the role of emotional mechanisms in financial decision-making. The rationality of financial markets is a contested issue in modern financial economics. Critics of the efficient markets hypothesis argue that investors are generally irrational, exhibiting a number of predictable and financially ruinous biases, often attributed to psychological factors. Tigges, et al [33] state that everyday financial decisions are made by using a number of risk-oriented behaviors, both positive and negative. They investigated the relationships between personality traits and financial decisions comparing financial risk behavior between East and West German citizens. One type of sample was drawn from the general East and West German populations. The other was drawn from the readers of the leading business magazine in East and West Germany. It was confirmed West Germans are more risk-oriented than East Germans and that readers of the business magazine are more risk-oriented than the non-readers. Business magazine readers differ from the average population. They show higher degrees of almost all relevant risk factors. These results may be explained by differences in socialization, where "capitalistic" and "socialistic" values, respectively, are supposed to have dominated theory and practice over long periods of time. Sarmiento [24] states that systematic relaxation of risk pricing for subprime loans during the U.S. housing bubble exploded the market.

H4: Consumers' investment self-efficacy positively influences mortgage financing decision choice and quality.

H5: Consumers' risk taking behavior positively influences mortgage financing decision choice and quality.

The research model depicting the various decision making factors investigated in our research with the corresponding hypotheses is displayed in Figure 1.

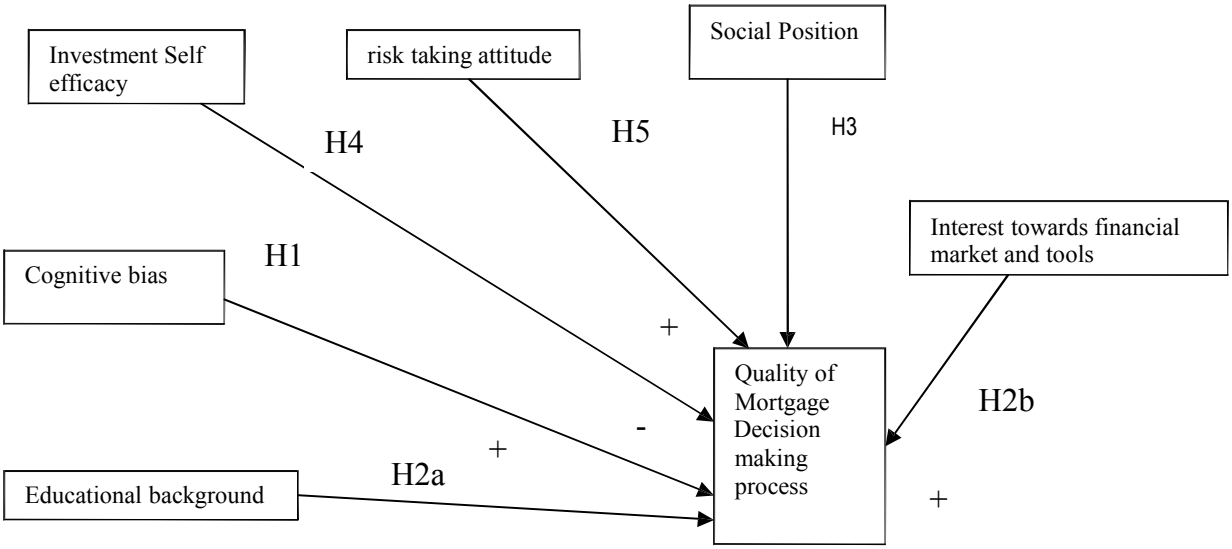

Figure 1. Model Diagram of Factors Influencing Mortgage Decision Making

3. **Data Collection**

In order to look into the validity of our model, we conducted a survey of homeowners or potential home owners who are planning to buy a home in near future. The survey was conducted using Survey Monkey and sent to a variety of subjects through the following channels: LinkedIn professional networking, yahoo finance network groups, email invitation to graduate students, and to the clients of some mortgage brokers. There were 141 completed surveys. The respondents were 73% male and 27% female. Only 6 of the respondents were students.

Education wise distribution:	
High School and eqv	5%
Bachelor and eqv	40%
Masters and eqv	36%
Doctorate and eqv	20%

Income wise distribution:	
<50,000	8%
50,000-100,00	25%
100,000-150,000	32%
150,000-250,000	19%
250,000 and up	7%

Age wise distribution:	
20-30	12%
31-40	28%
41-50	40%
51-60	18%
61 and up	2%

Table1. Sample distribution

4. Data analysis

The mortgage decision making process involved multiple decision criteria, including: minimal cost of financing, minimum monthly payment, lower interest rate, and lower terms. Multi-Criteria Decision-Making (MCDM) models have multiple different analysis methods like weighted sum method (WSM), weighted product method (WPM), analytical hierarchy process (AHP) etc. However, Sorooshian et al [34], Noor Azizah KS Mohamadali [35] proposed Structural Equation Modelling (SEM) methods to validate evaluation framework for multi-criteria decision techniques using AMOS or PLS approach. We intended to use Structured Equation Modeling (SEM) for data analysis with AMOS for our study.

The data was preprocessed for missing values and completeness. Surveys with more than 3 missing values were eliminated resulting in 95 usable completed surveys. Only a few completed surveys with less than 3 missing data were replaced with the mean of nearby points to establish the missing value. Mean substitution makes only a trivial change in the correlation coefficient and no change in the regression coefficient, but the standard error could be impacted. Initial analysis tested for construct validity on the measurement items. Component factor analysis with maximum likelihood technique is used to test construct validity. Items under all constructs are considered and eliminated progressively to generate the highest Cronbach's alpha. We also required at least 3 items per construct to ensure robustness in the measurement of the corresponding decision making factors. Measurement items with low Cronbach's alpha are

eliminated from the SEM. Hence we eliminated interest and social position from our model. Due to the strong theoretical findings that education positively influences financial investments [15,6], the education construct was kept even though we found it had a low Cronbach's alpha score. This may have been caused by the survey population not having a large variance in education. The construct items chosen and corresponding Cronbach's alpha is listed in Table 2. Constructs with a Cronbach's alpha of at least 0.6 were kept along with the Education construct and these are included in a SEM. We used IBM SPSS AMOS tool which gives the power to perform, specify, estimate, assess, and present the model to see hypothesized relationships among variables. The AMOS approach encompasses multivariate analysis and extends standard methods – including regression, factor analysis, correlation and analysis of variance.

Construct	Items	Cronbach's alpha
Self Efficacy	SelfEfficacy_1, SelfEfficacy2_1, SelfEfficacy3_1	0.625
Education	ED1, ED2_1, ED5_1	0.566
Cognitive Bias	CogB1, CogB2, CogB4T	0.738
Interest	Int1_1, Int3T_1, int5_1	0.311
Social Position	SocialPos1, SocialPos2	0.588
Risk	Risk3T,Extra100SaingsRank, Extra1000CDorSARank	0.716

Table 2. Cronbach's alpha score for mortgage decision making factors (From SPSS)

5. Results

After completing the factor analysis a Cronbach's alpha score for reliability was performed with the results shown in Table 2. Prior research [25,26] supports keeping constructs with a Cronbach's alpha score of at least .6 as the lower limit for exploratory research.

The SEM model was then constructed for all constructs with Cronbach's alpha scores above .6 and the Education construct using AMOS (see Figure 2 in Appendix 1). SEM AMOS use to analyze our mortgage decision factors model for model validity and statistical goodness of fit as is well established and appropriate [34]. The results from AMOS are shown in Appendix II. Based on the result we found chi-square values to be 128.582 for degrees of freedom of 86 with a probability level = .002 which is statistically significant. Also, from Table 3, we can see only investment self efficacy has a significant influence on perceived quality of the mortgage decision and other factors have minimal effect.

The Comparative Fit Index (CFI) is considered a reliable measure of fit with small samples. There is no single evaluation rule on which everyone agrees. Hu and Bentler [36] provide rules of thumb for deciding which statistics to report and choosing cut-off values for declaring significance. Malhotra et al. [37] states model fit is assessed in terms of comparative fit index (CFI), goodness-of-fit index (GFI), and root mean square error of approximation (RMSEA). A model is considered to be satisfactory if CFI > 0.95, GFI > 0.90, and RMSEA < 0.06 [36, 37]. When RMSEA values are close to .06 or below and CFI and TLI are close to .95 or greater, for example, the model may have a reasonably good. Brown [39] states that the comparative fit index (CFI) evaluates fitness of a user-specified solution in relation to a more restricted, nested baseline model, in which the covariance among all input indicators are fixed to zero. CFI ranges from 0 for a poor fit to 1 for a good fit. Our CFI value is .838.

The Tucker-Lewis index (TLI) is another index for comparative fit that includes a penalty function for adding freely estimated parameters [39]. Netemeyer [40] provided two fit indices that have been viewed as robust to sampling characteristics: the Tucker–Lewis index (TLI) and comparative fit index (CFI). Values in the .90 range have been noted as designating adequate fit for these indices. Our TLI value is 0.774.

We know from previous research [41, 42] Incremental Goodness of Fit (IFI) as a goodness of fit is suggested to be a value between of 0.9 and 0.95. Our IFI value is .857

Our Root Mean Square Error of Approximation (RMSEA) is .073. Values less than .06 indicate good fit, and values greater than .10 indicate poor fit.

Based on that thumb rule, our result is not perfect but not far off either.

	Estimate	S.E.	C.R.	P
Self Efficacy	.703	.165	4.270	.001
Risk	.204	.182	1.121	.262
Education	.054	.084	.648	.517
Cognitive Bias	-.147	.194	-.759	.448

Table **3**. SPSS AMOS Result

6. Limitations and Future work

One of the most important limitations of our study is small sample size. Since we tried to collect data from people who own a home or are planning to buy one with 6 months to a year, in the present market condition, this criteria limited the size of our purposive sample. We hope to get more data in the future to overcome this limitation. While significant effort was made to collect data from different types of people to respond to survey, the sample may still have a bias towards people with internet connection and higher income/education bias. There was also disparity between genders in the survey. Future studies will be focused on refining the model and using subgroups of samples like gender, education, and finance self-efficacy to understand the model.

There are other approaches to be considered such as the Graphic Chain Model which will increase the validity of the model and may provide deeper insight into mortgage decision making process.

There could be other factors on which the consumer decision making process depends. The quality of the mortgage decision was evaluated as the consumers' perceived quality. More direct measurement of actual mortgage investment quality may help eliminate further bias. Also, though subjects are from all over US, they were mostly concentrated in the Denver metropolitan area, which may have inherent bias and an external validity issue, since this area of the country was largely insulated from early housing market crisis effects.

An unusual finding of the current study is the low influence of education on the mortgage decision making process, which appears to contradict findings of prior research [15,6]. While this may be explained with the more homogenous sample as opposed to prior research, it bears further investigation to determine if in fact educational differences in the population at large are shrinking and thus having less of an impact on financial decision making. Future research will investigate more heterogeneous educational backgrounds that may better reflect the home purchasing population at large to determine if education level remains a viable factor in distinguishing financial decision making

7. Conclusions

Mortgage based securities (MBS) and its inherent lack of transparency was one of the reasons for the financial meltdown in 2008. While many academic papers looked at this financial meltdown from a market perspective, this paper tries to find the reasons why consumers made these mortgage decisions and developed a model of influential decision factors for mortgage decision making. We explored factors like cognitive bias, risk aversion, educational background, and investment self efficacy to find out the potential relationship and degree of association to perceived decision making quality. We used structured equation modeling (SEM), specifically SPSS AMOS, to validate the proposed decision factor model. The result showed investment self efficacy had some influence on quality of decision making but other factors had limited or no influence. We need to validate this result with wider populations and for various subpopulations to validate our model.

8. References

[1] Yandle, Bruce, (2010).Lost Trust The Real Cause of the Financial Meltdown. Independent Review; Winter2010, Vol. 14 Issue 3, p341-361, 21p

[2] Barua, Samir K & .Gujarathi, Mahendra (2009). Global Economic Meltdown: Greenspan's Legacy. The Journal for Decision Makers; Jul-Sep2009, Vol. 34 Issue 3, p9-14.

[3] Kaboub, Fadheli, Todorova, Zdravka; Fernandez Luisa (2010), Inequality-Led Financial Instability: A Minskian Structural Analysis of the Subprime Crisis.International Journal of Political Economy; Spring2010, Vol. 39 Issue 1, p3-27, 25p

[4] McVea, Hany (2008). Hedge fund administrators and asset valuations - does it all add up?, Journal of Financial Regulation & Compliance; 2008, Vol. 16 Issue 2, p130-141, 12p

[5] Zimmerman, Thomas, (2007). The Great Subprime Meltdown of 2007. Journal of Structured Finance; Fall2007, Vol.13 Issue 3, p7-20, 14p

[6] Crotty, James, Epstein, Gerald (2009).Avoiding Another Meltdown.Challenge (05775132); J an/Feb2009, Vol.52, Issue 1, p5-26, 22p

[7] Dalal, Reeshad S. & Bonaccio, Silvia (2010).What types of advice do *decision*-makers prefer? Organizational Behavior & Human Decision Processes; May2010, Vol. 112 Issue 1, p11-23, 13p

[8] Vitt, Lois A (2004). Consumers' Financial Decisions and the Psychology of Values; Journal of Financial Service Professionals; Nov2004, Vol. 58 Issue 6, p68-77, 10p

[9] Morrison, Elizabeth W & Vancouver, Jeffrey B (2000). Within-Person Analysis of Information Seeking: The Effects of Perceived Costs and Benefits. Journal of Management; 2000,v26 Issue 1, p119-137

[10] Hilton, Denis J (2001). The Psychology of Financial Decision-Making: Applications to Trading, Dealing, and Investment Analysis. Journal of Psychology & Financial Markets; 2001, Vol. 2 Issue 1, p37-53

[11] Kuusela, Hannu, Spence, Mark T. & Kanto, Antii J. (1998). Expertise effects on prechoice decision processes and final outcomes. European Journal of Marketing; 1998, Vol. 32 Issue 5/6, p398-576, 19p

[12] Walczak, S. & Fishwick, P. (1997). A Quantitative Analysis of Pattern Production and Its Relationship to Expert Performance. Journal of Experimental and Theoretical Artificial Intelligence, 9 (1), 83-101.

[13] Sorce, Patricia, Loomis, Lynette, Tyler, Philip R (1989). Intergenerational Influence on Consumer Decision Making. Advances in Consumer Research; 1989, Vol. 16 Issue 1, p271-275, 5p.

[14] Araña, Jorge E, León, Carmelo J (2009). Understanding the use of non-compensatory decision rules in discrete choice experiments: The role of emotions; Ecological Economics; Jun2009, Vol. 68 Issue 8/9, p2316-2326

[15] Horton, Robert V., Weidenaar, Dennis J (1975). Wherefore Economic Education?; Journal of Economic Education; Fall75, Vol. 7 Issue 1, p40-44

[16] Penn, Roger(1999). The Dynamics of Decision-making in the sphere pf skills' formation. Sociology; Aug99, Vol. 33 Issue 3, p621-638

[17] Lesseig, Vance P., Fulmer Jr., John G (2003).;Including a Decreased Loan Life in the Mortgage Decision.Journal of Financial Planning; Dec2003,Vol. 16 Issue 12, p66-70

[18] Luna, Robert E , Reid, Richard A (1986) Mortgage Selection Using a Decision Tree Approach. Interfaces; May/Jun86, Vol. 16 Issue 3, p73-81

[19] Fleming Jr., John J (1973). Social Position and Decision Making Involving Risk. Human Relations, Feb73, Vol. 26 Issue 1, p67-76, 10p

[20] Ladd, Helen F.,(1998).Evidence on Discrimination in Mortgage Lending, Journal of Economic Perspectives, Spring98, Vol. 12 Issue 2, p41-62, 22p

[21] Benson, Clea (2011). A Renewed Crackdown On Redlining., Bloomberg Businessweek; 5/9/2011, Issue 4228, p31-32, 2p

[22] Ezeala-Harrison, Fidel,Glover, Glenda B.(2008). Journal of Economic Issues (Association for Evolutionary Economics); Mar2008, Vol. 42 Issue 1, p75-96, 22p

[23] Bostic, Raphael W(2003). A Test of Cultural Affinity in Home Mortgage Lending. Journal of Financial Services Research; Apr2003, Vol. 23 Issue 2, p89, 24p

[24] Sarmiento, C. (2009). Regime changes in sub-prime margins under the US housing bubble. Applied Financial Economics, 19, 175–182.

[25] Narasimhan, Ram & Jayaram, Jayanth (1998). "Causal Linkages in Supply Chain Management: An Exploratory Study of North American Manufacturing Firms.".Decision sciences (0011-7315),29(3), p.579.

[26] Nunnally, J. C. (1967). Psychometric theory. New York: McGraw-Hill.

[27] Belch, M. & Willis, L. (2003). Family decision at the turn of the century: Has the changing structure of households impacted the family decision-making process? Journal of Consumer Behavior, vol 2.2, p111-124.

[28] Forbes, James, Kara, S. Murat (2010). Confidence mediates how investment knowledge influences investing self-efficacy.Journal of Economic Psychology; Jun2010, Vol. 31 Issue 3, p435-443, 9p

[29] Endres, Megan Lee, Chowdhury, Sanjib K, Alam, Intakhab (2008). Gender Effects on Bias in Complex Financial Decisions. Journal of Managerial Issues; Summer2008, Vol. 20 Issue 2, p238-254, 17p

[30] Coulibaly, Brahima, Li, Geng(2009). Choice of Mortgage Contracts: Evidence from the Survey of Consumer Finances.Real Estate Economics; Winter2009, Vol. 37 Issue 4, p659-673, 15p,

[31] Stone, Eric R , Yates, Andrew J , Caruthers, Allison S(2002). Risk Taking in Decision Making for Others Versus the Self. Journal of Applied Social Psychology; Vol. 32 Issue 9, p1797-1824

[32] Lo, Andrew W, Repin, Dmitry V, Steenbarger, Brett N (2005). Fear and Greed in Financial Markets: A Clinical Study of Day-Traders. American Economic Review; May2005, Vol. 95 Issue 2, p352-359

[33] Tigges, Peter, Riegert, Axel, Jonitz, Lothar, Brengelmann, Johannes, Engel, Rolf R.(2000). Risk Behavior of East and West Germans in Handling Personal Finances. Journal of Psychology & Financial Markets; 2000, Vol. 1 Issue 2, p127-134,

[34] S. Sorooshian, Z. Norzima, I. Yusof, M.Y. Rosnah (2011). Multi-criteria structured educational factors for project managers, Proceedings of the IETEC'11 Conference,KualaLumpur,Malaysia. http://ietec-conference.com/ConferenceProceedings/ietec/papers/Conference%20Papers%20Non-Refereed/NR4_77.pdf

[35] Noor Azizah KS Mohamadali, Modelling Students' Perception on User Acceptance Factors - Multi-criteria Decision Analysis (MCDA) Techniques, IMA seminar, http://ima.ac.uk/slides/mnk-10-05-2011.pdf.

[36] Hu, L., P. M. Bentler. 1999. Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. Structural Equation, Model Vol.6,Issue1,p1-55.

[37] Naresh K Malhotra, Sung S Kim, James Agarwal (2004). Internet Users' Information Privacy Concerns (IUIPC): The Construct, the Scale and a causal model, Information Systems Research; Dec 2004; vol15, No4, p336-355.

[38] Bearden, W. O., R. G. Netemeyer, M. F. Mobley. 1993. Handbook of Marketing Scales: Multi-item Measures for Marketing and Consumer Behavior Research. Sage Publications, Newbury Park, CA.
[39] Brown, T. A. (2008), Confirmatory Factor Analysis for Applied Research. American Statistician, Vol. 62 Issue 1,p91-92.
[40] Netemeyer, Richard G. (1996).Development and Validation of Work -- Family Conflict and Family -- Work Conflict Scales, Journal of applied psychology (0021-9010), 81 (4), p. 400
[41] Sawyer,Alan Page, Jr., Thomas J. (1984). The Use of Incremental Goodness of Fit Indices in Structural Equation Models in Marketing Research, Journal of Business Research; Sep1984, Vol. 12 Issue 3, p297-308, 12p
[42] Bentler. Peter M., Bonett, Douglas G (1980). Significance tests and goodness fit in the analysis of covariance structures, Psychological Bulletin 88, p588-606.

9. Appendix I

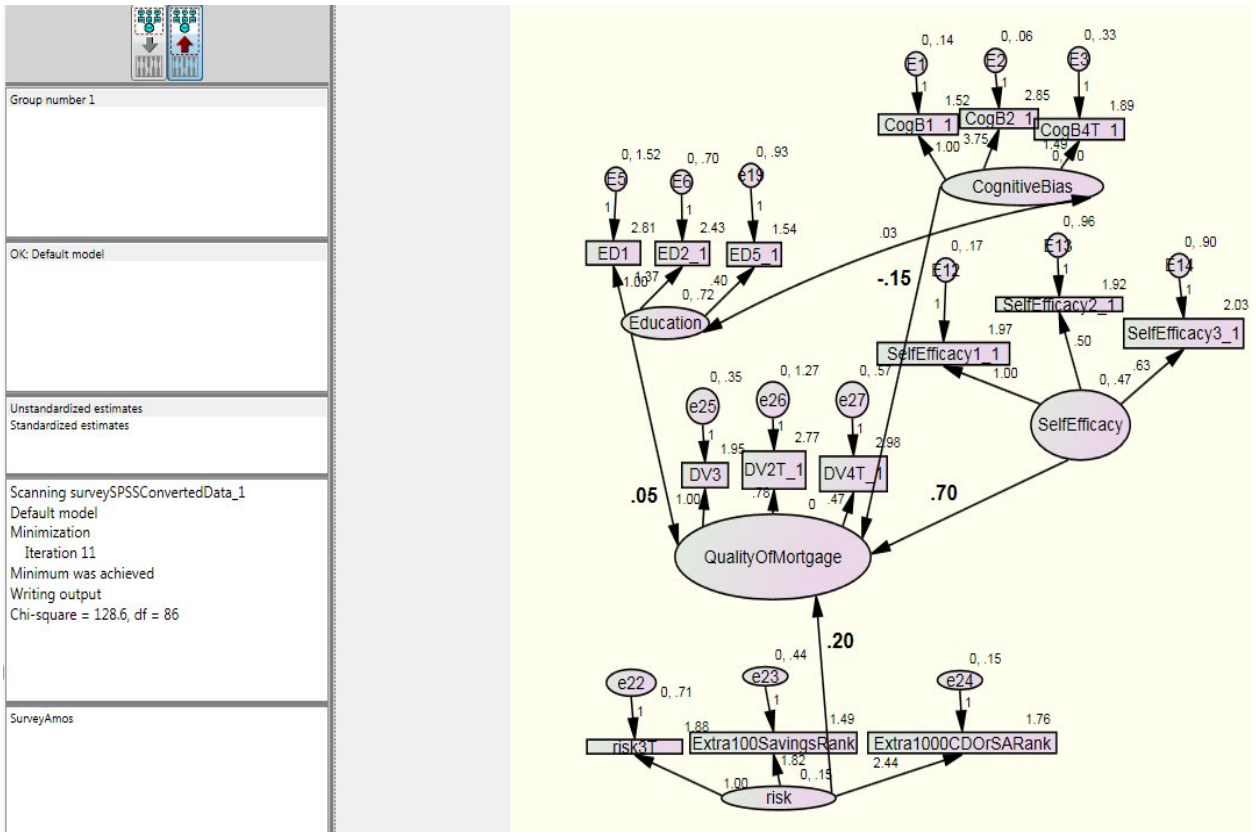

Figure 2. AMOS model of factors influencing mortgage decision making

Appendix II. **SPSS AMOS Result**

CMIN

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	49	128.582	86	.002	1.495
Saturated model	135	.000	0		
Independence model	15	382.882	120	.000	3.191

Baseline Comparisons

Model	IFI Delta2	TLI rho2	CFI
Default model	.857	.774	.838
Saturated model	1.000		1.000
Independence model	.000	.000	.000

RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	.073	.045	.098	.086
Independence model	.153	.136	.170	.000

Chi-square = 128.582
Degrees of freedom = 86
Probability level = .002

Notes for Model (Default model)
Computation of degrees of freedom (Default model)

Number of distinct sample moments: 135
Number of distinct parameters to be estimated: 49
Degrees of freedom (135 - 49): 86
Result (Default model)

Minimum was achieved

Regression Weights: (Group number 1 - Default model)

			Estimate	S.E.	C.R.	P
QualityOfMortgage	<---	SelfEfficacy	.703	.165	4.270	***
QualityOfMortgage	<---	Risk	.204	.182	1.121	.262
QualityOfMortgage	<---	Education	.054	.084	.648	.517
QualityOfMortgage	<---	CognitiveBias	-.147	.194	-.759	.448
ED1	<---	Education	1.000			
ED2_1	<---	Education	1.369	.646	2.118	.034
CogB1_1	<---	CognitiveBias	1.000			
CogB2_1	<---	CognitiveBias	3.752	.722	5.199	***
CogB4T_1	<---	CognitiveBias	1.492	.267	5.588	***
SelfEfficacy1_1	<---	SelfEfficacy	1.000			
SelfEfficacy2_1	<---	SelfEfficacy	.503	.186	2.703	.007
SelfEfficacy3_1	<---	SelfEfficacy	.630	.193	3.271	.001
ED5_1	<---	Education	.397	.162	2.452	.014
risk3T	<---	Risk	1.000			
Extra100SavingsRank	<---	Risk	1.823	.525	3.474	***
Extra1000CDOrSARank	<---	Risk	2.437	.800	3.046	.002
DV3	<---	QualityOfMortgage	1.000			
DV2T_1	<---	QualityOfMortgage	.778	.290	2.680	.007
DV4T_1	<---	QualityOfMortgage	.470	.192	2.450	.014