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The behavior of household finance on demographic characteristics in Pakistan

Muhammad Zubair Mumtaz[a] and Zachary Alexander Smith[b]

[a]School of Social Sciences & Humanities, National University of Sciences & Technology, Islamabad, Pakistan; [b]Tapia College of Business, Saint Leo University, St Leo, FL, USA

ABSTRACT

This study analyzes the effect of demographic characteristics on household finance in Pakistan. Using Household Integrated Economic Survey data and applying the proportional sampling technique, we determine that household size, secondary and tertiary education, gender, size of income, urban area, occupation, and province-wise residency are the important predictors of household finance. We split our dataset controlling for household size, age, and income. This study identifies a small variation in the determinants of household finance when examining the behavior of small- and large-sized households, young and mature households, and low- and high-income households. We compare our results with previous literature and report that the behavior of households varies in different countries due to different demographic characteristics. Hence, the behavior households vary across countries; however, there is no specific factor that varies as we move from country to country.

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1. Introduction

What determines household financial decisions? The economic theory undertakes the fact that consumers make household finance decisions by borrowing, investing, saving, or consuming funds depending on their preferences, expectations, and the costs-benefit analysis of borrowing and saving (see Stango & Zinman, 2009). Previous studies (e.g. Campbell, 2006; Gogolin et al., 2017; Renneboog & Spaenjers, 2012; Stango & Zinman, 2009) emphasize that psychological factors based on preferences, expectations, and problem-solving are important determinates of household financial decisions. Additionally, the psychological influences that affect household finance decisions are dependent on the demographic characteristics of households. Earlier studies (Curtis et al., 2017) document that the demographic characteristics vary from across countries, regions, etc. In line with the argument, it is important to examine how demographic characteristics influence household financial decisions.

CONTACT Muhammad Zubair Mumtaz zubair@s3h.nust.edu.pk

In his seminal work, Campbell (2006) proposes the concept of household finance and suggests that the behavior of households varies when they intend to participate in different types of financing. He argues that both demographics and risk factors are important determinants of household portfolio decisions. In general, households make decisions regarding their finances considering personal traits or demographics. Researchers (Dierkes et al., 2011; Gao & Fok, 2015) document that household financial decisions are affected not only by the philosophy of rational choice but also emphasize the personality traits of the individuals making decisions related to their household finances. In the wake of financial mistakes, financial economists are required to propose measures that overcome the incidence and welfare costs. It is important that academic finance influences consumer regulations, disclosure rules, and the provision of investment default options (Campbell, 2006). The research in this area is called household financial engineering which provides a powerful practical rationale for research in the study of household finance.

Many studies have examined the determinates of household finance by considering wealth and demographic factors (Campbell, 2006), economic attitudes (Renneboog & Spaenjers, 2012), personality traits (Brown & Taylor, 2014), social interaction (Hong et al., 2004), demographics and social interaction (Gao & Fok, 2015), social interactions and internet access (Liang & Guo, 2015), and individual values (Gogolin et al., 2017). Pakistan is a developing country and household's ability to obtain financing to meet their financial obligations is an issue. Households in Pakistan have limited funds and those that have additional resources do not know where to invest. Demographic traits play a particularly important role in explaining how households use financing. For instance, young people may have different needs when compared against older people and people living in urban areas may choose to allocate their resources differently than those that live in rural areas. Likewise, the number of household members, education, occupation, marital status, and other factors may influence investment opportunities. Considering these factors, we are interested in exploring the demographic characteristics that influence the financial decisions of households.

This study aims to examine the factors that affect household financial decisions in Pakistan. It is argued that the behavior of households varies when they are faced with different financing options (Campbell & Viceira, 2002). The behavior of households residing in developed and developing countries may be different because of their living conditions are different, the structure of their income, the financing opportunities available to them, and their age group. While reviewing the earlier studies, we find limited literature that examined the behavior of household finance in developing and emerging economies. Most of the studies have investigated the norms and behavior of household finance for individuals living in developed countries. One of the main reasons for limited literature in emerging and developing market economies is that researchers lack the information required to conduct this type of analysis. This gap in the literature motivates us to explore the demographic factors that affect household finance in Pakistan.

We use the Household Integrated Economic Survey conducted in 2015/16 to examine the demographic characteristics of household finance in Pakistan. To further extend our analysis, we split our dataset to examine the household behavior based on

the size, age, and income of the associated households. We also compare the results of the current study with earlier studies to determine the differences in the decisions related to demographics and individual characteristics of households.

The rest of the paper is organized as follows. Section 2 summarizes the related literature, Section 3 presents the data and variables used, Section 4 describes the econometric specification, Section 5 discusses the estimation results, and Section 6 concludes.

2. Overview of household finance and demographic characteristics

This section reviews the previous literature to develop the relationship between social/demographic factors and household finance. The ensuing paragraphs summarize the main findings of earlier studies.

2.1. Behavior of household finance and demographics in developed economies

In an early study, Campbell (2006) examine the relationship between wealth and the effect of demographics on household finance using the dataset of 4,304 participants in the United States. He considers public equity, private business, and the proportion of portfolio investment as dependent variables. He argues that age, education, level of income, number of children, and tolerance for investment risk are important predictors of household finance. The theory argues that portfolio preferences are based on investment decisions in terms of expected returns of risky assets during different time horizons (Bodie et al., 1992). The aging of investors affects the selection of the portfolio as they have a smaller time horizon relative to young investors (Campbell & Viceira, 2002).

Hong et al. (2004) examine the relationship between social interaction and stock market participation in the United States. In terms of social interaction, they identify how well the households know their neighbors, visit neighbors, and attend church. They indicate that sociability might be associated with optimism, which thereby affects stock market participation. Hong et al. (2004) report that social households who interact with their neighbors or attend church significantly prefer to participate in the stock market as compared against non-social households controlling for wealth, race, education, and risk tolerance.

In another study, Gogolin et al. (2017) examine the individual values and behavior of the household finance of Dutch participants. Using a household's savings, investment, and the share of investments as the proxies of household finance, they find that the difference in cultural values influences the financing behavior of households. Brown et al. (2016) study the effect of social interaction on household finance and report that social interaction depends on the sizeable amount of debt and assets of households.

Cooper and Zhu (2016) develop a life-cycle model for determining a household's financial decisions and report that higher education is associated with a lower entry cost of the stock market and a large discount factor. Using a propensity towards risk aversion versus individualism from households located in Germany and Singapore,

Breuer et al. (2014) analyze the factors that cause household finance by giving a choice either to invest in equity or risk-free assets. They report that most of the households prefer to participate in risk-free instruments. They also identify that individuals' attitudes concerning financial risks affect financial decision behavior. Renneboog and Spaenjers (2012) examine the change in economic attitudes and financial decisions between religious and non-religious households using saving, equity investment, and the percentage of stock investment as proxies for financial decisions. In addition, they incorporate religious affiliation, demographics, wealth/income, psychological, and economic parameters to determine the financing attitude of households. They report that in general economic attitudes vary between religious and non-religious households. Moreover, they document that Catholic households are risk-averse and Protestant households are financially more responsible.

To test the household sociability related to holding risky assets, Dierkes et al. (2011) determine that the effect of sociability is higher among young households. They also report an economically significant interaction between age and the effect of sociability on the probability of holding risky assets. Brown and Taylor (2014) use the British Household Panel Survey and argue that extraversion significantly influences household finance in terms of debt and assets. However, the relationship between personality traits and household finance various across the nature of debts and assets in the household portfolio.

To determine the psychological biases, Stango and Zinman (2009) suggest that exponential growth bias provides a practical narrative for both interest/payment and future value bias that is based on cognitive psychology. On the behavior of households, the interest/payment bias is strongly associated with savings, borrowings, portfolio choices, and the net worth of households. Among others, Guiso et al. (2008) measured the effects of trust on international stockholding behavior, Georgarakos and Pasini (2011) investigated both household sociability and regional trust, and Breuer et al. (2014) gauged the impact of national culture on the portfolio structure in a cross-country comparison.

2.2. Behavior of household finance and demographics in developing economies

Gao and Fok (2015) analyze around 12,000 households using the dataset from the 2010 Chinese Family Panel Studies. To measure household financing activities, they employ deposits, risky assets (i.e. stocks and mutual funds), and formal and informal financing. They argue that household size, education, agricultural hukou, age, gender, and household income influence the decisions to invest in risky assets and save in the same manner. To contrast formal and informal financing, they identify that household heads with higher education are more likely to rely on formal financing. In conclusion, they found that households with strong family and social interaction are more likely to borrow, save, and invest in risk assets.

In terms of measuring the gap between urban and rural household finance in China, Sui and Niu (2018) report the probability of participating in multiple financial products is smaller in rural households. The gap between urban and rural households is attributed to differences in education, financial literacy, income, wealth, and the

local supply of finance. Curtis et al. (2017) examine the demographic profiles in Japan, China, and India. They find that changing age profile affect a large proportion of household saving rates across countries.

Previous studies show that most researchers examined the financing behavior of households in the developed markets. The literature relating to demographic characteristics and household finance is limited in developing countries. As the financing pattern and behavior of households varies from country to country, it is important to investigate how households located in Pakistan behave when making their financial decisions. This seems to be a gray area that motivated us to shed light on the predictors that drive household finance in Pakistan. The purpose of this study is to examine the financial decision making of households that compel them to deposit their funds in banks, invest in shares/bonds or other securities, and borrow from the banks. In this study, we employ demographic factors to determine what factors influence the financial decisions of households.

3. Data and sampling

The data used for the analysis was obtained from the Household Integrated Economic Survey conducted in Pakistan during the 2015 and 2016 periods. Pakistan's Bureau of Statistics developed its sampling framework for both urban and rural areas. The data is gathered from households and individuals across four provinces. The data covers a series of socio-economic indicators (e.g. literacy rate, primary enrolment rates, household consumption expenditure, and income from various sources). This survey covers 24,238 households and 157,638 individuals. The dataset is appropriate to analyze household finance due to the availability of important parameters.

In this study, we use proportional sampling technique wherein the researchers split a finite population into subpopulations and then uses random sampling method in each subpopulation. Proportional sampling is like proportional allocation in finite population sampling but it can also be applied to other survey sampling circumstances. For a finite population with population size 'N', the population is divided into 'H' strata as per given characteristics. The size of the hth stratum is presented as 'N_h' and $\sum_{h=1}^{H} N_h = N$. The proportional sampling indicates a design with total sample size n as: $n_h = n\frac{N_h}{N}$ and $\sum_{h=1}^{H} n_h = n$. Hence, a simple random sample with sample size n_h would be chosen within each stratum. In line with this method, we choose our sample from four provinces, and the number of sample households in each province is determined using the stratified sampling method proportional to size. Finally, we select the data of 2,608 households for our analysis from four provinces.

To evaluate the demographic factors of different aspects of household finance, we investigate households' financial activities at different levels. First, we consider the net savings of the household during the last year and construct a dummy variable, that is the existence of net savings of households, which takes the value of one and zero otherwise (Gogolin et al., 2017; Sui & Niu, 2018). Second, the ownership of risky assets which seems an important indicator of financial market participation. Standard portfolio theory (Markowitz, 1991) envisages that it is favorable for households to hold part of their portfolio in risky assets to earn the risk premium. The risky assets

Table 1. Variable definitions.

Variables	Definition
Dependent variables	
Savings	1 if a household has net savings in 2015/16, 0 otherwise
Risky assets	1 if a household has invested in shares/ bonds or other securities, 0 otherwise
Borrowings	1 if a household has borrowed from a bank, 0 otherwise
Independent variables	
Household size	Number of people residing in the household
Education: illiterate	1 if a household is illiterate, 0 otherwise
Education: primary	1 if a household obtained a primary education, 0 otherwise
Education: secondary	1 if a household obtained a secondary education, 0 otherwise
Education: tertiary	1 if a household obtained tertiary education, 0 otherwise
Male	1 if a household head is male, 0 otherwise
Age	Age of household head (in years)
Married	1 if a household head is married, 0 otherwise
Household income	Household income of head (Rupees)
Own house	1 if a household is living in their own house, 0 otherwise
Urban	1 if a household is located in an urban area, 0 otherwise
Occupation: agriculture	1 if a household head occupation is in the agriculture industry, 0 otherwise
Occupation: waged	1 if a household head is a salaried person, 0 otherwise
Occupation: self-employed	1 if a household head is self-employed, 0 otherwise
Province: KPK	1 if a household head is located in Khyber Pakhtunkhwa province, 0 otherwise
Province: Punjab	1 if a household head is located in Punjab province, 0 otherwise
Province: Sindh	1 if a household head is located in Sindh province, 0 otherwise
Province: Balochistan	1 if a household head is located in Balochistan province, 0 otherwise

This table presents a description of the variables used in this study.
Source: Authors' calculations.

variable takes the value one if a household participates in owning shares/bonds or other securities and zero otherwise (Renneboog & Spaenjers, 2012). The third indicator associated with financial market participation concentrates on access to short-term credit and accordingly a dummy variable is created which is one if a household borrowed funds from a bank and zero otherwise (Gao & Fok, 2015).

Prior studies and modern portfolio theory describe many reasons that lead to households' ownership of financial instruments. These factors may vary across different household sizes, incomes, and age groups. We include an age-squared term to capture the non-linear age effect in the regression. The extensiveness of data permits us to evaluate these factors in length. Considering earlier studies and modern portfolio theory, we use demographic characteristics as a regressor that may influence the financial decisions of a household (Guiso & Sodini, 2012; Sui & Niu, 2018). Table 1 presents a description of the variables employed in this study. We incorporate age, gender, marital status, and the province of the household head. We also control for household size, whether the household is located in an urban/rural area, whether their house is owned/rented, and the level of education which are important determinates and likely to influence consumption requirements, spending decisions, the responsibilities of household members, and the amount of resource available for saving and investing. Furthermore, we include the households' employment characteristics which show whether the household is engaged in the agriculture business, a salaried person, or self-employed. These characteristics also regulate their personal financial experience as well as the coverage of households which may affect the ownership of financial products.

The financial decisions are largely dependent upon household income. According to Sui and Niu (2018), income and wealth are closely related to households' ability to

Table 2. Summary statistics.

	N	Mean	Median	SD	Min.	Max.
Savings	2,608	0.603	1	0.489	0	1
Risky assets	2,415	0.074	0	0	0	1
Borrowings	2,448	0.109	0	0	0	1
Household size	2,608	6.164	6	2.383	1	14
Education: illiterate	443	0.170	0	0.376	0	1
Education: primary	902	0.346	0	0.476	0	1
Education: secondary	833	0.319	0	0.466	0	1
Education: tertiary	435	0.167	0	0.373	0	1
Male	2,608	0.855	1	0.258	0	1
Age	2,608	44.046	44	12.144	15	73
Married	2,608	0.969	1	0.175	0	1
lnHousehold income	2,608	12.553	12.539	0.625	9.465	14.306
Own house	2,608	0.784	1	0.412	0	1
Urban	2,608	0.502	1	0.500	0	1
Occupation: agriculture	645	0.247	0	0	0	1
Occupation: waged	1,374	0.527	1	0	0	1
Occupation: self employed	589	0.226	0	0	0	1
Province: KPK	535	0.205	0	0.404	0	1
Province: Punjab	945	0.362	0	0.481	0	1
Province: Sindh	822	0.315	0	0.465	0	1
Province: Balochistan	306	0.117	0	0.481	0	1

This table presents summary statistics of the variables used in this study.
Source: Authors' calculations.

fulfill the costs of participation in the financial market and willingness to take financial risk. Due to the non-availability of household wealth, we exclude it from the analysis.

A summary of the statistics associated with the data is exhibited in Table 2. The results show that on average 60.3% of the households managed to save money in the last year. We can also observe that 7.4% of all households invested in risky assets such as stocks/bonds or other securities. In the sample, 10.9% of all households obtained short-term credit. The analysis of the study around household size which shows that as the size of the household increases the household might be less able to participate in the financial markets. On average, the household size is 6.2 with minimum and maximum sizes are 1 and 14 respectively. The other important variable is the education of households. By categorizing it into illiterate, primary, secondary, and tertiary education, the results show that 34.6% of households received primary education, 31.9% received secondary education, 16.7% receive tertiary education, and the rest of households are illiterate. 85.5% of the respondents are male and the average age of a household is reported at 44 years. Interestingly, 96.9% of households are married while others are unmarried. A major portion of households is located at their own houses (i.e. 78.4%) and 50.2% of the sample population are residing in urban areas.

4. Econometric specification

In this study, household finance activities are considered as dependent variables categorize as binary variables, thus, we use the probit model to estimate our results. In a probit model, binary outcome represents the dependent variable with the occurrence of two possibilities like yes or no.

Probit regression is a distinct type of Generalized Linear Models where the bivariate outcome $p \in (0, 1)$. Let, $EY = p$. The probability function is expressed as:

$$probit(EY) = \Phi^{-1}(p) = \Phi^{-1}(P[= 1]) \quad (1)$$

where Y has a Bernoulli distribution with parameter p (success probability $p \in p \in$). Equation (1) transforms the expectation of 0/1 as a dependent variable. The probit of the mean is showed as a linear blend of the covariates X, i.e. we have a linear predictor

$$probit(EY) = X\beta \quad (2)$$

where β is a vector of unknown variables. The maximum likelihood-based technique is used for parameter estimation.

To study how the probability of participation of household finance ($HF^* > 0$) varies according to individual characteristics (Sui & Niu, 2018), the following probit model is calculated[1]:

$$P(HF^* > 0) = \Phi(\acute{\beta}X) \quad (3)$$

where Φ shows the distribution function of a standard normal random variable, X is the vector of observable regressors, and β is a vector of parameters.

Following the same model, we identify the predictors of household finance classified into net savings, participation in risky securities, and short-term credit. The purpose of employing the different parameters is to analyze the effect of behavioral factors on household finance which are likely to be different for net savings, investment in risky assets, and short-term borrowings. These are three different predictors for measuring the behavior of household finance. For instance, (a) net savings of households may vary depending upon their expenses that can be fulfilled in a year. In the case that savings equal expenses, then net savings will not exist and (b) participation in investing in risky assets (e.g. stock, bonds, or other securities which may provide higher returns; however, it is the choice of the household to expose their investment to higher risks which may provide higher returns), and (c) borrowing of short-term credit, which may be obtained by a household to meet his/her expenses occurring in a year. The model includes the variables commonly used in the applied literature to examine the determinants of household finance (Gao & Fok, 2015; Renneboog & Spaenjers, 2012).

5. Results and discussion

5.1. Effect of demographics characteristics on household finance

We initially model the relationship between financial decisions and household composition which include household size, income, and residency in a province, controlling for individual characteristics. Financial decisions are classified based on net savings, participation in risky assets, and short-term credit using probit technique.

Table 3. Demographic characteristics and household finance.

	Savings		Risky Assets		Borrowings	
	Coeff.	*t*-value	Coeff.	*t*-value	Coeff.	*t*-value
Household size	−0.1144	−10.06***	−0.0053	−0.31	0.0314	2.05**
Education: primary	0.1093	1.46	0.0916	0.76	−0.0061	−0.06
Education: secondary	0.1735	2.28**	0.0981	0.80	−0.1488	−1.41
Education: tertiary	0.1450	1.66*	0.2366	1.76*	−0.0661	−0.55
Male	0.2410	2.33**	−0.0399	−0.25	0.0596	0.43
Age	0.0059	0.40	−0.0262	−1.19	0.0186	0.88
Age-squared	−0.0001	−0.58	0.0003	1.28	−0.0002	−1.03
Married	0.1447	0.94	0.2921	1.09	−0.1267	−0.62
lnHousehold income	0.0408	0.95*	0.0424	0.65	0.0267	0.45
Own house	0.3153	1.04	0.3938	0.80	−0.1231	−0.33
Urban	0.2475	4.41***	0.1503	2.04**	−0.1492	−1.97**
Occupation: agriculture	0.0972	1.28	−0.1424	−1.22	−0.0670	−0.62
Occupation: waged	0.1135	1.78*	−0.0749	−0.79	0.0230	0.27
Province: KPK	0.1811	2.38*	0.3438	2.91***	0.4223	4.24***
Province: Sindh	0.1121	1.58	0.0674	0.59	−0.1832	−1.73*
Province: Balochistan	0.0925	1.05	0.5178	4.17***	0.6840	6.57***
Constant	1.2159	1.72*	−1.2345	−1.13	−1.2995	−1.35
Number of obs	2,608		2,415		2,448	
Log (pseudo) likelihood	−1680.41		−620.98		−790.75	
Pseudo *R*-squared	0.0410		0.0292		0.0649	
Probability $> \chi^2$	0.0000		0.0031		0.0000	

Note. ***, **, and * show significant at 1, 5, and 10% level. For household education, the base category is 'illiterate'; for occupation, the base category is 'self-employed'; and for province-wise location, the base category is 'Punjab'.
Source: Authors' calculations.

Table 3 exhibits the findings of household demographics and financial decisions. The results show that household size is inversely proportionate to the propensity to save and the probability of investing in risky assets. This illustrates that as the financial burden increases with household size and the ability to save and invest in risky assets declines. Generally speaking, financing requirements increase with the level of household size. The coefficient of household size is positive and significantly affected by short-term credit, which suggests that large households are more likely to borrow funds.

The coefficients of primary, secondary, and tertiary education are positive except that the primary education variable is insignificant in the saving equation. Comparing the results of savings, we determine that secondary education households saved more than tertiary education households. A similar pattern is observed for risky assets; however, the coefficient of tertiary education is only significant. This shows that households that obtain greater levels of education tend to invest a part of their portfolio in risky assets to obtain excess returns. The coefficients of primary, secondary, and tertiary education are negative in terms of short-term credit but insignificant which indicates that higher- and lower-educated households are less inclined towards borrowing funds.

Male households are more likely to save but less likely to invest in risky assets (Gao & Fok, 2015; Sui & Niu, 2018). Similarly, male household heads are more likely to borrow short-term credit but this variable is insignificant. In the saving equation, the coefficient of age (age-squared) is positive (negative). The age variable shows that the propensity to save increases with the age of household heads. In all financial decisions, the coefficient of age and age-squared presents an inverted U-shaped

relationship. We can infer from the results that with an increase in age, households are less reluctant to invest in risky assets but over time their level of borrowing increases. Implying that they have financial resources but simultaneously their financial burden increases (e.g. education expenditures), which tends to increase the level of borrowing. Married households are more likely to save and invest in risk assets.

High-income households are more likely to save and invest in assets. The savings equation is significant at a 10% level illustrating that higher-income households have more financial resources so they tend to save more. With a higher level of income, they are more likely to invest in risky securities to earn higher returns and simultaneously to borrow short-term funds. Household income is, however, insignificant in both the risky assets and borrowing models. We find an insignificant association of homeownership with household finance. Household residents in urban areas are more likely to save and invest in risky assets, most likely due to the accessibility of financial resources, but they are less inclined to obtain short-term credit. Households working in agriculture and waged workers have a higher propensity to save. This variable is significant in terms of waged workers ensuring that households save their funds.

The coefficients of households residing in KPK, Sindh, and Balochistan are positive in the saving equation. We consider Punjab province as a base variable and find that all households located in these provinces are more likely to save than Punjab province. The significance of savings of households in the KPK province is more prominent. The coefficients of KPK and Balochistan province are positive and significant in the risky asset equation; however, the Sindh province is insignificant. Households located in KPK and Balochistan provinces are more likely to invest in stocks or other securities. Concerning short-term credit, the results report that households of the KPK and Balochistan province were involved in obtaining funds to fulfill their financing requirements whereas the coefficient of Sindh province is negative indicating that households are borrowing fewer funds when compared to the Punjab province. In summary, we find that household size, level of education, gender, household income, and occupations are important factors in determining household finance.

5.2. Effect of demographics and household finance controlling the household size

To extend our analysis for examining the demographics and household finance, we divide our sample into small- and large-sized households. Below and above the average household size is categorized into small- and large-sized households, respectively. In this section, we determine how the small- and large-sized households behave in their financing decisions.

Table 4 presents the estimation results of demographics and household finance controlling for household size. The coefficient of secondary education of large-sized households is only positive and statistically significant in the saving equation. We also find that primary and secondary educated large-sized households are more inclined to borrow short-term credit to meet their financial burdens. The relationship

Table 4. Demographics and household finance controlling the household size.

	Small-sized households			Large-sized households		
	Savings	Risky assets	Borrowings	Savings	Risky assets	Borrowings
Education: primary	0.0787	0.0502	0.2453*	0.1467	0.1456	−0.2374*
	(0.72)	(0.30)	(1.67)	(1.34)	(0.82)	(−1.66)
Education: secondary	0.0584	0.1660	0.0089	0.2477**	−0.0316	−0.2579*
	(0.53)	(1.02)	(0.06)	(2.20)	(−0.17)	(−1.73)
Education: tertiary	0.0248	0.1722	0.0946	0.1670	0.2645	−0.1821
	(0.19)	(0.90)	(0.52)	(1.35)	(1.36)	(−1.11)
Male	0.0981	0.0184	0.0923	0.1819	−0.3408	−0.1499
	(0.78)	(0.09)	(0.53)	(0.90)	(−1.24)	(−0.58)
Age	0.0074	−0.0032	0.0039	0.0026	−0.0350	0.0326
	(0.33)	(−0.10)	(0.12)	(0.13)	(−1.13)	(1.10)
Age−squared	−0.0002	0.0001	−0.0001	−0.0001	0.0004	−0.0003
	(−0.65)	(0.36)	(−0.31)	(−0.32)	(1.06)	(−1.11)
Married	0.1837	−0.1221	0.1414	−0.0153	0.1478	−0.3565
	(0.86)	(−0.39)	(0.47)	(−0.06)	(0.65)	(−1.22)
Household income	0.0225	0.0002	0.0492	0.0946	0.1073	0.0145
	(0.36)	(0.00)	(0.58)	(1.51)	(1.08)	(0.17)
Own house	−0.2131	0.2002	0.0606	0.0139	0.0808	0.0509
	(−1.30)	(0.85)	(0.35)	(0.12)	(0.29)	(0.30)
Urban	0.4265***	0.0641	0.2631**	0.0870	−0.0132	−0.0874
	(4.97)	(0.55)	(2.32)	(1.08)	(−0.10)	(−0.82)
Occupation: agriculture	0.0099	−0.1399	0.0844	0.3635***	−0.1851	−0.1935
	(0.09)	(−0.92)	(0.56)	(3.13)	(−0.97)	(−1.23)
Occupation: waged	0.0755	−0.1685	0.2518*	0.2011**	0.0240	−0.1871
	(0.79)	(−1.28)	(1.91)	(2.22)	(0.17)	(−1.59)
Province: KPK	−0.0618	0.4087**	0.7531	0.0828	0.2799*	0.2050
	(−0.55)	(2.35)	(5.11)	(0.78)	(1.68)	(1.48)
Province: Sindh	0.6857***	0.2399	−0.1277	−0.5041***	−0.1146	−0.2413
	(6.75)	(1.56)	(−0.85)	(−4.74)	(−0.64)	(−1.58)
Province: Balochistan	1.0706***	0.6649	0.8288***	−0.7954***	0.3679*	0.5540***
	(7.06)	(3.97)	(5.67)	(−6.10)	(1.92)	(3.61)
Constant	0.5895	−1.8992	−1.5841	1.0103	0.6097	−1.0308
	(0.64)	(−1.43)	(−1.24)	(1.07)	(0.42)	(−0.80)
Number of obs	1,404	1,302	1,331	1,204	1,082	1,117
Log (pseudo) likelihood	−780.87	−335.66	−389.35	−796.00	−279.43	−390.94
Pseudo *R*-squared	0.1118	0.0346	0.0997	0.0458	0.0372	0.0506
Probability $> \chi^2$	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

***, **, and * show significance at 1, 5, and 10% level. *t*-stats are reported in parenthesis. For household education, the base category is 'illiterate'; for occupation, the base category is 'self-employed'; and for province-wise location, the base category is 'Punjab'.
Source: Authors' calculations.

between primary educated small-sized households and short-term credit is statistically significant which reflects that they get funds from banks to fulfill their necessities.

Males of large-sized households are more likely to save but less likely to invest in risky securities. However, males of small-sized households may be persuaded to invest in risky assets. An important finding of this study is that male small-sized households borrow short-term funds at a greater rate when compared against large-sized households. The justification, for this reason, is that the coefficient of savings of male small-sized households is smaller than large-sized households. The coefficients of age in terms of small- and large-sized household's financial decisions are more or less the same but insignificant. Married small-sized households are more interested in saving, however, they behave in a more risk-averse manner when compared against large-sized households. There is no distinction between small- and large-sized heads of

households because they save funds, invest in risky assets, and borrow short-term credit when required. By critically analyzing the results, the coefficients of household income of large-size households are higher than small-sized households which reflects that they are more inclined to save funds, participate in risky securities, and obtain short-term credit.

The coefficient of own house in terms of small-sized households is negative in the savings equation because individuals seem to be more interested in investing in risky securities. The coefficients of small-sized households residing in urban areas are positive and significant in the savings and short-term credit equations. Small-sized household residents in urban areas are more likely to save and to meet their financial burdens by obtaining short-term credit. Large-sized households working in agriculture and waged workers are more likely to save their funds but the savings of agriculture households are higher. The results suggest that small-sized households residing in the Sindh and Balochistan provinces save more funds whereas in the KPK province individuals are more likely to invest in risky assets and to obtain short-term credit in Balochistan. Large-sized households residing in Sindh and Balochistan save funds; however, to fulfill their financial burdens they may obtain short-term credit. We also determine that the large-sized households of the KPK and Balochistan provinces are more likely to invest in risky securities to earn higher returns.

5.3. Effect of demographics on household finance controlling the household age

This section analyses the relationship between demographic characteristics and household finance by segregating the sample based on household age (Table 5). The average age of our sample is 44 years. Using this information, we classified households that were less than or equal to 44 years of age as young households and households that were more than 44 years of age as a mature household.

The coefficient of household size is negative which indicates that as the size of the household decreases there is a higher probability of net savings without taking into account the age of households. This finding is consistent with earlier studies as the size of the households increase, the greater the expenses are required to satisfy their needs thereby resulting in a lower level of net savings. The relationship between primary/tertiary education and savings is insignificant; however, the coefficient of secondary education is significant at the 10% level which illustrates that young households may save funds. The reason behind this finding is that young households may have lower liabilities, thus, they may have the possibility to save their funds. Consistent with this finding, secondary education and short-term credit have an inverse relationship which indicates that young households may save funds to fulfill their needs; thus, they are not required to borrow short-term funds.

Young male households may save funds due to a smaller financial burden; this evidence is statistically true from our analysis. However, male households neither invest in risky securities nor raise short-term credit if they are mature or young. We also find that the marital status of young or mature households does not affect household finance. Prior studies reported the existence of a strong correlation between

Table 5. Demographics and household finance controlling household age.

	Young household (≤44 years)			Mature household (>44 years)		
	Savings	Risky assets	Borrowings	Savings	Risky assets	Borrowings
Household size	−0.1323***	−0.0157	0.0361	−0.0965***	0.0084	0.0226
	(−7.91)	(−0.62)	(1.60)	(−6.13)	(0.36)	(1.06)
Education: primary	0.1159	0.0636	0.0065	0.1267	0.1289	−0.0241
	(1.07)	(0.37)	(0.05)	(1.20)	(0.74)	(−0.17)
Education: secondary	0.2166**	0.0229	−0.1547**	0.1453	0.1752	−0.1472
	(2.00)	(0.13)	(−1.03)	(1.35)	(1.00)	(−0.97)
Education: tertiary	0.0639	0.2721	−0.0244	0.2343*	0.2308	−0.1244
	(0.51)	(1.43)	(−0.14)	(1.91)	(1.20)	(−0.72)
Male	0.3238**	0.1264	−0.1992	0.0915	−0.2158	0.1122
	(2.41)	(0.58)	(−1.13)	(0.55)	(−0.91)	(0.47)
Married	0.1373	0.1333	0.0139	0.4917	−0.1932	−0.7333
	(0.87)	(0.51)	(0.06)	(1.20)	(−0.60)	(−1.56)
lnIncome	0.0473	0.0181	−0.0474	0.0208	0.1168	−0.0055
	(0.79)	(0.20)	(−0.57)	(0.34)	(1.25)	(−0.07)
Own house	0.0586	0.3033	−0.0992	0.3429*	0.5736**	−0.0003
	(0.30)	(0.87)	(−0.34)	(1.74)	(2.12)	(−0.00)
Urban	−0.1507*	−0.1261	−0.2308**	0.3553***	0.2204*	0.0774
	(−1.86)	(−1.01)	(−2.13)	(4.53)	(1.86)	(0.73)
Occupation: agriculture	0.1370	−0.0325	0.0643	0.0439	−0.2281	−0.2254
	(1.26)	(−0.19)	(0.42)	(0.41)	(−1.41)	(−1.45)
Occupation: waged	0.1540*	−0.0273	0.0749	0.0633	−0.1425	−0.0280
	(1.69)	(−0.20)	(0.59)	(0.71)	(−1.09)	(−0.24)
Province: KPK	0.3013***	0.6183***	0.4593***	0.0589	0.1390	0.4013***
	(2.68)	(3.39)	(3.02)	(0.56)	(0.86)	(2.96)
Province: Sindh	0.1631*	0.1814	−0.0954	0.0789	0.0539	−0.2621
	(1.65)	(1.04)	(−0.66)	(0.79)	(0.34)	(−0.24)
Province: Balochistan	0.1650	0.6924***	0.8087***	0.0392	0.3915**	0.5795***
	(1.31)	(3.68)	(5.47)	(0.32)	(2.27)	(3.87)
Constant	0.9206	−2.4531*	−0.9180	0.8416	0.6973	−0.7350***
	(1.12)	(−1.90)	(−0.80)	(0.91)	(0.55)	(−0.58)
Number of obs	1,285	1,198	1,202	1,323	1,217	1,246
Log (pseudo) likelihood	−815.00	−292.62	−389.15	−858.60	−321.11	−398.78
Pseudo *R*-squared	0.0485	0.0462	0.0785	0.0406	0.0299	0.0577
Probability $> \chi^2$	0.0000	0.0000	0.0000	0.0000	0.1375	0.0000

***, **, and * show significant at 1, 5, and 10% level. *t*-stats are reported in parenthesis. For household education, the base category is 'illiterate'; for occupation, the base category is 'self-employed'; and for province-wise location, the base category is 'Punjab'.
Source: Authors' calculations.

household income and household finance because as household income increases, the chance of saving funds and investing in risky assets increases. Our analyses are silent in this regard because the household income of young and mature persons does not affect financial decisions. We may infer from the results that age may not be a good proxy to include in studies of both household income and household finance.

Residents that own their house may be inclined to save funds because they are mature enough. This finding suggests that residents that own their homes may save their funds as it is not the case when analyzing individuals that rent their house. Based on their savings, the mature households seem to invest more of their funds in risky assets. Both savings and risky assets are significant variables in the case of mature households that own their house. In the case of young households, the relationship between household ownership and household finance is insignificant. Young households residing in urban areas save fewer funds due to the paucity of financial

resources. To meet financial requirements, young households residing in an urban area may likely to obtain short-term credit, this finding is statistically significant. Alternatively, mature households living in urban areas are likely to save funds over time and this option of gathered funds enables them to invest in risky securities to earn higher returns.

The results show that young waged workers may save more funds. The significance of this variable suggests that waged workers like to save their funds if they are young. However, the rest of the variables associated with waged workers and working in agriculture variables, are insignificant. Households located in the KPK or Sindh provinces may have the option to save funds without knowing the age of households. The coefficients of the KPK and Balochistan provinces are positive and significant which suggests that young households may like to invest in riskier securities to obtain higher returns. Interestingly, mature households residing in all the provinces may not save any funds, as the relationship is insignificant. Mature households living in the Balochistan province may invest in risky assets. The findings also indicate those mature households located in the KPK or Balochistan provinces may like to obtain short-term credit to meet their financing requirements relative to Punjab province.

5.4. Effect of demographics on household finance controlling household income

We divide our dataset based on low and high household income to examine how these households make financial decisions. The estimation results in terms of household income are reported in Table 6. The savings model identifies that the coefficient of household size is negative and significant which explains that the probability of saving funds depends upon the household size; however, the level of income is not a matter of concern. With an increase in income and size, households may emphasize meeting their expenses but they may access short-term financing if their resources are insufficient.

In the risky assets' equation, the coefficient of tertiary education is positive and statistically significant which illustrates that households with low income may like to prefer investments in risky assets. It is not the case that all households with a low income may prefer to explore risky investments but, in our case, the sample households might be interested in investing in some risky assets. The relationship between the different levels of education and risky assets/short-term borrowings is insignificant. The propensity of savings for male low-income households is higher which demonstrates that households with lower income are more cautious and save their funds for future times. Households residing in the KPK or Balochistan provinces may place more emphasis on participating in risky securities relative to the Punjab province. It is interesting to note that households located in these provinces may maximize their earnings by investing in these securities. Another finding that emerged from these results is that households living in the KPK or Balochistan provinces may like to borrow funds to cover their expenses. This evidence holds for both low and high household incomes. The other variables such as age, age-squared, marital status,

Table 6. Demographics and household finance controlling household income.

	Low household income			High household income		
	Savings	Risky assets	Borrowings	Savings	Risky assets	Borrowings
Household size	−0.1234***	0.0062	0.0057	−0.1009***	−0.0204	0.0581***
	(−7.71)	(0.26)	(0.27)	(−6.17)	(−0.84)	(2.60)
Education: primary	−0.0024	0.2515	−0.1717	0.2185**	−0.0221	0.1495
	(−0.02)	(1.39)	(−1.17)	(2.19)	(−0.13)	(1.06)
Education: secondary	0.1333	0.1435	−0.1688	0.2090**	0.0635	−0.1317
	(1.20)	(0.77)	(−1.13)	(1.99)	(0.38)	(−0.87)
Education: tertiary	0.0551	0.3760*	−0.1121	−0.1009*	0.1325	−0.0421
	(0.43)	(1.86)	(−0.65)	(−1.95)	(0.71)	(−0.25)
Male	0.2822*	−0.1409	−0.1004	0.1743	0.1427	−0.0563
	(1.91)	(−0.64)	(−0.52)	(1.22)	(0.62)	(−0.28)
Age	0.0148	−0.0284	0.0290	−0.0074	−0.0321	0.0103
	(0.74)	(−0.93)	(0.97)	(−0.34)	(−0.98)	(0.34)
Age-squared	−0.0001	0.0003	−0.0003	0.0000	0.0004	−0.0002
	(−0.75)	(1.01)	(−0.99)	(0.08)	(1.02)	(−0.51)
Married	0.0641	0.5303	−0.2416	0.2095	0.2181	−0.0772
	(0.26)	(1.10)	(−0.72)	(1.06)	(0.65)	(−0.29)
Own house	−0.0235	−0.1086	0.0833	−0.0692	0.0638	0.0665
	(−0.17)	(−0.42)	(0.32)	(−0.38)	(0.29)	(0.27)
Urban	0.2596***	0.3032**	0.0803	0.2248***	0.2655**	−0.2411**
	(3.30)	(2.57)	(0.75)	(2.75)	(2.14)	(−2.15)
Occupation: agriculture	0.0363	−0.2414	0.0606	0.1465	−0.0771	−0.1974
	(0.33)	(−1.38)	(0.40)	(1.38)	(−0.47)	(−1.27)
Occupation: waged	0.1271	−0.0336	−0.1110	0.0809	−0.1328	0.1443
	(1.41)	(−0.25)	(−0.90)	(0.89)	(−0.96)	(1.16)
Province: KPK	0.1733	0.4122**	0.5240***	0.1672	0.3370**	0.3440**
	(1.55)	(2.30)	(3.46)	(1.58)	(2.06)	(2.52)
Province: Sindh	0.0693	0.1803	−0.1233	0.1646	−0.0147	−0.1997
	(0.70)	(1.09)	(−0.83)	(1.58)	(−0.09)	(−1.26)
Province: Balochistan	0.0545	0.6599***	0.7280***	0.1253	0.3689**	0.6685***
	(0.40)	(3.46)	(4.40)	(1.07)	(2.18)	(4.85)
Constant	0.3900	−1.7606**	−1.7225**	1.5831	−0.9978	−1.9431***
	(0.78)	(−2.17)	(−2.35)	(1.17)	(−1.32)	(−2.66)
Number of obs	1,305	1,215	1,229	1,303	1,200	1,219
Log (pseudo) likelihood	−825.98	−307.77	−381.89	−850.59	−305.77	−400.43
Pseudo *R*-squared	0.0442	0.0482	0.0650	0.0396	0.0281	0.0830
Probability $> \chi^2$	0.0000	0.0084	0.0000	0.0000	0.2799	0.0000

***, **, and * show significant at 1, 5, and 10% level. *t*-stats are reported in parenthesis. For household education, the base category is 'illiterate'; for occupation, the base category is 'self-employed'; and for province-wise location, the base category is 'Punjab'.
Source: Authors' calculations.

owned house, and occupations do not affect household finance when we sorted their income level.

5.5. Discussion and a comparison with earlier studies

This section compares our findings with previous studies to identify the differences in the determinates that cause household finance decisions. In previous studies, researchers argued that the behavior of households depends on age, income, size of household, occupation, marital status, education, etc. They document that the behavior of households is diverse across different countries (Curtis et al., 2017).

This study is an attempt to examine the factors that affect household finance in Pakistan. Many studies have examined the determinates of household finance in developed countries but the literature in developing countries is limited. As the

behavior of households varies in developed and developing countries, this study adds in the literature by analyzing the factors that contribute to household finance in Pakistan. In this study, we follow the determinants used by Gao and Fok (2015). We find the same results between household finance and size as identified by Gao and Fok (2015) which infer that household size is negatively associated with the propensity to save and the probability of investing in risky assets. As financial requirements increase with household size, the possibility to save and invest in risky securities decreases. This increase in financing burden compels the large size households to fulfill their needs by getting short-term credit.

In terms of household education, we find the same results in the savings and risky assets equations as reported by Gao and Fok (2015). In all categories of education, households may like to save their funds as well as they may prefer to invest in stocks, bonds, or other securities. In the context of borrowing equation, Gao and Fok (2015) identify the coefficients of secondary and tertiary education are positive and significant while we report a negative and insignificant relationship. This illustrates that Chinese households probably obtain short-term credit to fulfill their financing requirements as their education level increases. The results of the male variable are also similar (see Gao & Fok, 2015; Gogolin et al., 2017), which suggest that a male is more likely to save funds but less likely to invest in risky securities. This finding supports the idea that women are more risk-averse than men (Arano et al., 2010; Charness & Gneezy, 2012; Mohammadi & Shafi, 2018). With regard to borrowings, Gao and Fok (2015) justify that male household heads obtain short-term credit through formal financing due to the higher economic status of a male in Chinese society.

The age of households is another important parameter of household finance. Our findings are different when compared against earlier studies with regard to the savings and risky asset equations. Gao and Fok (2015) find that the age of household heads and propensity to save are inversely proportionate which illustrates that a rise in the age of household increases financial burden due to relatively low income. This study determines a positive relationship illustrating that an increase in the level of age enhances the savings of households owing to comparatively higher income.

The married household variable was not employed by Gao and Fok (2015), however, it is insignificant in other studies. Among others, household income acts as a catalyst to determine household finance. We find the same results as reported by Gao and Fok (2015) while Gogolin et al. (2017) identify an inverse relationship between income and household finance. Gao and Fok (2015) argue that high-income households are more likely to save and invest in risky assets. Likewise, an increase in the level of income enhances the likelihood to borrow short-term funds. Based on the Dutch households' survey, Gogolin et al. (2017) suggest as income increases the probability of household savings decreases due to increases in their expenditures. Interestingly, an inverse relationship exists between household income and risky assets which indicates that as the Dutch household income increases, the possibility of investing in risky securities decreases. This evidence might be different than earlier studies; however, it is insignificant.

Gao and Fok (2015) find homeownership has a strong association with risky investments but we determine a positive and significant relationship between

homeownership and the savings of households. This makes sense that homeowners may save funds instead of paying for a rented house, this indirect amount is referred to as a part of savings. Our finding is consistent with Gao and Fok (2015) reporting that household residents in urban areas are more likely to save and invest in risk assets. Researchers (Gao & Fok, 2015; Sui & Niu, 2018) further identify that households residing in an urban area may not like to borrow funds. In terms of occupation, these findings provide mixed results that depend on the number of households involved in particular job-related activities.

In conclusion, we find that the predictors of household finance depend on the behavior and characteristics of households (Renneboog & Spaenjers, 2012; Stango & Zinman, 2009). While analyzing different studies, we report the mixed results which indicate that besides the factors discussed above, individual norms and cultures may affect the decisions related to household finance. By combining the results of the above studies, we find that household size, education, income, gender, age, marital status, urban, and occupation are the important factors related to household financial decisions.

6. Conclusion

This study analyzes the demographic factors that affect household finance in Pakistan. Most studies examine the determinants of household finance in developed countries while literature in developing countries is quite limited. The behavior of household finance varies in developed and developing countries owing to different financing habits, individual values, and economic attitudes. This study examines the predictors that affect household finance in Pakistan using the Household Integrated Economic Survey.

This study finds that: (a) as household size decreases, households seem to save more funds and borrow less through short-term credit facilities, (b) as the level of education increases, the probability associated with these educated households' decisions to save funds and invest in risky assets increases, (c) male households are likely to save funds but less likely to invest in risky assets, (d) high-income households may be inclined to save and invest in risky assets, (e) the propensity to save and invest in risky assets for household residents residing in urban areas is higher, (f) only waged workers prefer to save but are less likely to invest in risky assets, and (g) households located in the KPK and Balochistan provinces are significantly involved in participating risky assets relative to the Punjab province.

We also segregate our dataset by controlling for household size, age, and income to investigate the factors that influence household finance. Controlling for household size, we split our sample into small- and large-sized households. We report that primary education, urban, waged workers, and provinces are the factors that affect small-sized household finance and primary and secondary education, occupation, the KPK and Balochistan provinces are statistically significant determinants of large-sized household finance decisions. We further classify households age into young and mature households and report that most of the determinates are the same influencing young and mature households. Likewise, most of the factors are

also the same for low-income and high-income households. Lastly, we compare our findings with earlier studies and argue that the behavior associated with household finance may vary from country to country due to the different demographic characteristics of households.

The policy implication of this study is to create awareness among households for a better understanding of different financing options so they can participate in saving funds, investing in different risky assets, and obtaining short-term credit from different financial institutions. The government may introduce financial literacy programs at the household level which enables them to be educated about different financing possibilities. The limitation of this study is to examine the effect of demographic characteristics on household finance without considering social and culture values of households. For future studies, it is proposed that both demand-side and supply-side effects are required to be considered for analysis.

Note

1. The prevailing method in applied economic studies that use surveys on households is to analyse participation in financial markets using a probit model where the dependent variable is treated as an all-or-non variable (Gao & Fok, 2015; Gogolin et al., 2017; Sui & Niu, 2018).

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