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Research Article

Determinants of Household Leverages in Faisalabad

Saaima Ijaz¹, *Imran Qaiser², Samra Subhani³

¹ Department of Economics, Government College University Faisalabad.

² Department of Economics, Government College University Faisalabad.

³ National Business School, The University of Faisalabad, Saleem Campus, Faisalabad.

ABSTRACT

This study is an attempt to explore the socioeconomic determinants of household leverages in Faisalabad. Primary data for this study have been collected through a structured questionnaire from 250 households. Households had borrowed money from formal and informal institutions. Structural Equation Modeling results reveal that household leverages was high among households belonging to urban areas, nuclear families, educated class, older household heads and self-employed. Financing cost, Volatile income and income affected by covid 19 were the other important determinants of household leverages. The hedonic price model was used to evaluate the level of home-value mis-estimation by conducting another regression only for those households whose heads have their own homes. The results revealed that household leverages were significantly high for those households who overestimated their home-value.

Key Words: Household Leverages, Structural Equation Modelling, Covid-19, Income Volatility, Hedonic Price Model

INTRODUCTION

Household leverage had a crucial role in the 2008-2009 Great Recession, with highly indebted households in the United States seeing larger declines in job status and consumption spending. Surge increase in household debt to GDP led to declined GDP growth with a high rate of unemployment. The negative relationship between changes in household debt to GDP and subsequent output growth is larger in countries with tighter monetary policy limitations (Mian et al., 2017). In Pakistan, literature on household leverage is very insufficient no exact data is available on the size of household debt although household leverages becoming more common in Pakistan. State Bank of Pakistan reported that consumer financing in terms of documented/formal loans was Rs.700 billion in 2018-2019. The Access to Finance Survey 2015 SBP reports that household informal borrowing was Rs.1104 billion. The annual household debt in Pakistan was Rs 6061.16 billion HIES (2017-2018). During July-March of FY2021, consumer finance flows have been increased by Rs 131.7 billion having a growth rate of 24.6 percent as opposed to Rs 15.3 billion with a growth rate of approximately 2.8 percent in the preceding year (State Bank of Pakistan). In recent years' consumer financing increased for house construction, auto loans, and personal debt. Income volatility, higher dependency ratio, and unskilled labor forced household to remain indebted over a long period because the lower level of income unable households to pay off their obligations According to David Graeber, such households lived in a condition of permanent debt dependency (Graeber, 2014). Several studies have observed the association among household debt, house prices, household income, and consumption.



Correspondence

Imran Qaiser

iq_fspk@yahoo.com

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Household consumption was positively and significantly related to housing prices by relaxing borrowing constraints. Moreover, consumption related to higher income groups and older households with lower Debt-to-income ratios experienced an increasing trend in house prices while changes in house prices rarely affected consumption in higher Debt- to-income or lower-income groups (Choi et al., 2015). Household consumption is sensitive to adverse income shocks in economic scenarios where people are heavily indebted and have limited liquid assets, thereby impeding collective spending growth (Jung & Kim, 2020).

Risk in the labor market is influenced by households' decisions related to asset portfolio choices and income volatility. When households faced increased income insecurity, they reduced overall risk exposure by reducing price risks in asset selection (Chang et al., 2021). Over-indebted households seem to be more responsive to fluctuations in income level and interest rates, therefore an increase in household leverage causes in decrease in consumption and in the long run weaker internal economic growth. Debelle (2004); Juselius & Drehmann, (2015); Xing et al., (2021). At the same time, more investment is allocated to household borrowing, which reduces the demand for nondurable and durable items (Zhang & Guo, 2020). Households purchasing patterns and general economic well-being negatively impacted by excessive indebtedness and debt burden trajectories although debt payment responsibilities obstruct spending pattern which determined by households socioeconomic variables specifically highly indebted households were to be the most vulnerable having low quality of nutrition and health status as compared to households without financial obligations (Ditimi et al., 2021).

A major portion of the reduction in consumption during the Global Financial Crisis(GFC) can be attributed to a rise in Household Leverage before Global Finance young and highly leverage households reduced spending more after crisis as compared to average households (Kovacs et al., 2018). The burden of debt affected pre-retirement middle-aged households consumption behavior as opposed to younger aged households, In addition, the consumption elasticity of highly indebted families were much larger than that of households with little to no debt (Nakajima, 2020). Under strong policy interventions rising income inequality had a strong positive influence on the expansion of household leverage and also on banking crises, thus a higher debt-to-income ratio is linked to a greater risk of financial disaster after asset bubble bursts furthermore housing bubble led to financial fragility of households (Gu et al., 2019).

Every household regardless of income has expressed a great desire to educate their children. if the poor's families' real income rises children's education becomes more important (Jenkins et al., 2019). The effect of households leverage on education spending was not well recognized moreover, in underdeveloped countries, increased households leverage that deteriorates households' education expenditure behavior due to a lack of credit management and disposable income (Gerlach-Kristen & Merola, 2019; C. Li et al., 2016).

Pakistan's economy has been fighting to remain stable before the outbreak of COVID-19 but it was not in danger of collapsing, while pandemic has had a disastrous effect on Pakistan economy, bringing it close to bankruptcy. However

economy of Pakistan seems unable to handle the pandemic's tremendous disruption (Sareen, 2020). According to (Mahmud & Riley, 2021), household income, life satisfaction, and expenditure on food were decreased as a response to COVID-19 lockdown while net borrowing of Rural Ugandan households increased. Fallon and Lucas, (2002) found that during the financial crisis debt level had risen especially from microfinance institutions and among villages. Households experienced decline in real wages these households respond to this drop in income through increased labor participation.

Household leverage in Pakistan has risen dramatically in recent years. A higher debt to income ratio hurts one's mental health. Household leverage is associated with bad health, mental disorders and lower level of well-being. Across many studies have found that financial burdens like consumer finance and home foreclosures have demonstrated the substantial signs of unhappiness, general psychological suffering, suicidal thoughts and emotional disorder (Brown et al., 2005; Drentea & Reynolds, 2012; Hojman et al., 2016). Sweet et al., (2013) have suggested that greater debt-to-asset ratio is associated with greater apparent stress, depression, weak self-reported general health, and higher blood pressure. Debt becomes the most serious problem when it caused to over-indebtedness defined as a situation in which household's funds were insufficient to meet all payments of commitments and incapable to cover living expenditures over a long period. Over-indebted households were experienced inferior satisfaction of life and adverse emotional well-being along with weaker health and sleep quality as compared to non-over indebted households. Burden of leverage was attributed to serious psychological implications upon individuals,

including anxiety, stress, worse mental and physical health along with debt encourages suicidal thinking and heart disease (Blázquez & Budría, 2015; Sweet et al., 2013). Debt “ may be a more sensitive measure of financial Well-being than income” as debt implies cumulative hardships over time (Drentea & Lavrakas, 2000). It is revealed that household debt, specifically the consequences of education debt and leverage for housing from sources other than bank source, had a substantial adverse influence on happiness as well as well-being. Furthermore, housing debt would bring households under psychological and economic stress (Liu et al., 2020). (Angel, 2016) studied the effect of over-indebtedness on health among twenty-five European countries, and found that households that took debt over the previous twelve months significantly increased the chance of reporting bad health. The burden compared to without indebted households, so it was evidenced that debt collection costs support the relationship between debt and health, while the social stigma effect was weak. By making a comparison between European and Asian countries, the household leverage situation is almost the same. (Amit et al., 2020; Turunen & Hiilamo, 2014) examined the consequences of debt and found that Asian indebted households were more suffered suicide ideation, depression, stress and anxiety than those households that were not in debt. According to Kukk, (2016), higher leveraged households (debt-to-income ratio) were more financially vulnerable.

The main contribution of this study is to provide evidence about the mental health of leveraged households in Pakistan. Apart from financial stress, researchers from several fields have revealed that household leverage has an impact on the economic and psychological well-being of households. Cai et al., (2021) investigated the impact of the household leverage on family well-being in Malaysia, across different measurements of well-being, that is consisting of economic well-being, emotional well-being, and health of households and relations of households. It was found that growing leverage ratio trends are associated with worse well-being across multiple dimensions. In comparison to other dimensions of well-being the influence of household leverage has been sufficiently appears on emotional well-being. All indicators of psychological well-being were strongly connected to household debt. This effect includes not only burden, but also unhappiness and nervousness.

MATERIALS AND METHODS

This study was conducted in department of Economics in October 2021 and took around three months to complete. It was based on primary data collected from 250 houses. The convenience sampling technique has been used for the selection of sample. According to (Kumar, 2018) Convenience sampling is a non-probability sample approach that is mostly guided by the researcher and it is convenience in terms of choosing suitable respondents, easy availability, geographic closeness, known contracts, and ready approvals for the research. Due to time and cost constraints, this study used a non-probability sampling technique to choose respondents from respective households.

For data collection from the indebted households a self-administered questionnaire was used. Structured questionnaires were used to obtain data from households. Pilot study was conducted on 15 respondents and change in the questionnaire were made accordingly. Questionnaires have the advantages of being the most reliable and efficient tool for data collection (ibid). In terms of reliability and validity the accuracy of the data collected was highly dependent on the data collection instruments. The term “head of household” has no formal definition, although it is generally defined as the main financial provider, decision maker, and eldest member of the family (Nenova et al., 2009).

The data collection method was extremely difficult and hard. Several problems occurred during data collection, including respondent’s lack of awareness of their total monthly expenditures, savings and funding. The data collection method was time-consuming and expensive. The study’s respondents were all household heads and making it impossible to reach intended household heads. The first step is to identify those households that have taken on debt, which is challenging. Next, the researcher must approach these households, which was difficult. The survey questions contained sensitive information such as household income, financial assets, physical assets, property value, and total debt, households were unwilling to participate. Another issue was that illiterate households did not comprehend the questionnaire, thus it took a long time to ask each question one by one whereas educated households, such as bankers, teachers, and managers, do not have time to respond to the survey questions.

The target population lived in different tehsils of Faisalabad, the researcher had to incur substantial travel costs in order to reach them. As a female researcher faced security issues while interviewing the male household head and travelling alone. Collected data was stored in an adequate manner to facilitate statistical analysis which included software and statistical manipulation. For analysis quantitative data from the questionnaire was loaded into a statistical package for social sciences (SPSS version 22). The processed data was entered into the Stata 14

software for estimating the results. Structural Equation Modelling has been used to explain and understand the association among variables. The statistical output was interpreted and discussed throughout the results and findings presentation.

Estimation of Structural Equation Modelling

SEM (structural equation modelling) has been used to complete the analysis. It is distinguished from other modeling approaches because it examines both direct and indirect effects on pre-assumed causal relationships. When a third mediator variable intervenes between two other related constructs, this is referred to as mediation. In the PLS-SEM path model, a change in the exogenous variable causes a change in the mediator variable which causes a change in the endogenous variable. As a result, the existence of the relationship between two constructs is controlled by a mediator variable that explains why two variables are related by positing an intervening or mediating variable that is M as a link between an explanatory variable X and an outcome variable Y.

When the dependent variable is continuous two methods are used for calculating the mediated effect and both methods provide similar estimates of mediation. In the first regression equation, the dependent variable is regressed on the independent variable. The mediating variable is added as an independent variable in the second regression equation. The difference in independent variable coefficient in the two regression equations is equal to the magnitude of the mediated or indirect effect. When the mediator variable is included in the model and the coefficient of the explanatory variable is zero, the effect of the independent variable is completely mediated by the mediating variable. When the mediator is included in the model and the independent variable coefficient is zero, the effect of the independent variable is completely mediated by the mediating variable.

Hypothesis of Structural Equation Model

Ho = There is direct significant relationship between Covid-19 and Household Leverages

H1 = There is an indirect significant relationship between Covid-19 and Household Leverages with an intermediation of volatility

Econometric Equation

Household Leverages = $\alpha_0 + \alpha_1 \text{Covid} + \alpha_2 \text{CV} + \varepsilon_1$

Household Leverages = $\beta_0 + \beta_1 \text{Covid} + \beta_2 \text{Volatility} + \beta_3 \text{CV} + \varepsilon_2$

Volatility = $\lambda_0 + \lambda_1 \text{Covid} + \varepsilon_3$

α_1 is the total effect of Covid-19 on household leverage

β_1 is the direct effect of Covid-19 by assuming Volatility constant

$\lambda_1 \times \beta_2$ is the indirect effect of Covid-19 on household leverages

CV is the covariate such as age, education, family system, region, interest rate, average propensity to consume (APC), Dependency ratio, Self-employed, per capita income of households

Hedonic Price Model Estimation

The hedonic price method (HPM) is also known as the hedonic demand theory or hedonic regression. This method is used to estimate the value of the characteristics of a commodity that influence its market price indirectly. It's also used to estimate a commodity's demand (Herath & Maier, 2010).

Hypothesis of Hedonic Price Model

Ho = There is an insignificant relationship between home value estimation and household Leverages

H1= There is a significant relationship between home value estimation and household Leverages

Estimation Equation

$$\begin{aligned} \text{Lnph} = & \alpha + \beta_1 \text{age} + \beta_2 \text{floor} + \beta_3 \text{size} + \beta_4 \text{rooms} + \beta_5 \text{street width} + \beta_6 \text{security wall} \\ & + \beta_7 \text{conerplot} + \beta_8 \text{material floor} + \beta_9 \text{material wall} + \beta_{10} \text{material roof} + \beta_{11} \text{hcon} \\ & + \beta_{12} \text{disroad} + \beta_{13} \text{dispschool} + \beta_{14} \text{dispark} + \beta_{15} \text{dish} + \beta_{16} \text{disbank} + \beta_{17} \text{discenter} \end{aligned}$$

Description of the variables

The following variables have been used in Structural equation modelling for analysis

Dependent variables

Household leverages

Household leverage varies throughout time, as it is determined by the original amount borrowed, the repayment deadline, and the household's ability to repay. Three approaches are used to calculate household leverages:

Household leverages were taken as a dependent variable to empirically achieve the objective of the study.

Firstly, household leverage is measured by the ratio of the total debt to the total annual income of households

$$\text{Leverage ratio} = \frac{\text{Total debt}}{\text{Total annual income}}$$

Secondly, household leverage is measured by the ratio of total debt to financial assets of households.

$$\text{Leverage ratio} = \frac{\text{Total debt}}{\text{Financial assets}}$$

Thirdly, household leverage ratio is measured by the total debt-to-physical assets of households.

$$\text{Leverage ratio} = \frac{\text{Total debt}}{\text{Physical assets}}$$

The total debt of the household includes both formal and informal debt. Bonds, bank accounts, stock market shares, cash, and other financial assets are examples of financial assets, whereas physical assets include real estate, gold, silver, land, buildings, machinery, and vehicles.

Furthermore, leverage1 is equal to **Total debt / Total annual income**

Leverage2 shows total **debt / financial asset**,

Leverage3 indicates total **debt / physical asset**

Independent variables

Table 1. Detail of independent variables is given below:

Variable	Type of Variables
Covid-19 Pandemic	Yes= 1 No=0
Age of household head	No. of Years
Education of household head	No. of Years
Family system of household head	Joint= 1 Nuclear=0
Region of household head	Rural=1 Urban=
Interest rate	In Pak Rs
Average propensity to consume	$\frac{\text{Consumption of household in years}}{\text{Personal income of households in a year}}$
Dependency Ratio	Number of dependents / Total family size
Employment status of household head	Self-employed=1 Employed=0
Per capita Income of household head	Pak Rs

Mediating Variable

Detail of mediating variable is given below:

Income volatility

Income volatility is used in structural equation modelling as an intermediating variable.

$$\text{Volatility} = \frac{\text{Highest income} - \text{Lowest Income}}{\text{Highest income} + \text{Lowest income}}$$

Results and Discussion

The above table shows the relationship between the dependent variable (Leverage1) and the independent variable (Covid-19). It is demonstrating that Covid-19 has a direct negative and statistically significant influence on the debt-to-income ratio. It is significant at a 5% level of significance. The households who suffered more have more volatile income. This is due to the fact that the closure of business and sudden lockdown owing to Covid-19 forced households to stay at home because of this shock households' income has been decreased so it directly influenced the debt-to-income ratio of households. Temporary income households were not sure about their future income as a consequence of negative income shock caused by covid-19 households reduced their leverage ratio significantly. The Covid-19 pandemic has posed a great threat to the lives and livelihoods of the less educated and less paid households than to those of the more educated and higher paid households. It has been revealed that Covid-19 exacerbated income inequalities among Pakistani households. During the lockdown period middle-income

households have experienced the sharpest declines in income. Furthermore, households in a developing economy like Pakistan are often caught in a vicious cycle of poverty. Due to the high percentage of income spent on consumption, low-income households have very little savings.

As a result, having access to debt is essential in getting these households out of this dilemma. Commercial banks are generally reluctant to lend low-income households after the covid-19 shock. So more affected households by the sudden negative shock of Covid-19 have considerably reduced their leverage ratio. The results of Leverage 2 indicate that Covid-19 has a direct positive and statistically insignificant influence on the debt-to-financial asset ratio. It is insignificant at a 10% level of significance. The reason is that low-income households are devastated by the threat of losing their livelihoods due to negative shocks caused by Covid-19. The results indicate that Covid-19 has an insignificant influence on the debt-to-physical asset ratio of households. It is insignificant at a 10% level of significance. Covid-19 had a direct impact on households' businesses. As a result, more households became financially vulnerable. When households are in financial distress, banks perceive them as loan defaulters and are less willing to lend to them.

Table 2. Results of Structural Equation Modelling (SEM) for Leverage1, Leverage 2, Leverage 3

Variables	Leverage 1		Leverage 2		Leverage 3	
	Coefficient	Std. Error	Coefficient	Std. Error	Coefficient	Std. Error
Direct effect						
Covid	-0.93302	0.364824	0.009157	0.877181	0.192341	0.141443
Indirect effect						
Covid	-0.29247	0.159151	-1.29391	0.410063	-0.09482	0.061124
Total effect						
Volatility	-0.89226	0.470203	-3.94746	1.130554	-0.28928	0.182298
Covid	-1.22549	0.333042	-1.28475	0.814215	0.09752	0.128845
Age	-0.00673	0.01465	-0.01564	0.035816	-0.01	0.005668
Education	0.073449	0.028373	0.094722	0.069365	0.000777	0.010977
Family system	-0.70249	0.224782	-0.66367	0.549544	-0.1238	0.086962
Region	-0.2262	0.283471	-0.70403	0.693025	-0.23732	0.109667
Interest rate	-0.03994	0.011596	-0.02318	0.028351	-0.00808	0.004486
Apc	-0.7674	0.621331	3.122534	1.519018	-0.51731	0.240376
Depratio	-0.25051	0.428913	2.623972	1.048598	-0.09038	0.165935
Self-employed	0.062837	0.275538	-1.16448	0.67363	-0.13109	0.106598
PYF	-0.00217	0.001132	-0.00452	0.002767	-0.00062	0.000438

Indirect Effect of SEM

The above-mentioned results indicate that Covid-19 has an indirect statistically significant influence on the debt-to-income ratio. It is significant at a 10% level of significance. The results of empirical estimates results show that income volatility act as a mediator between Household leverage (debt-to-income ratio) and Covid-19. Different households are affected differently by the Covid-19 pandemic. Different sources of income may have differential influences on the likelihood of an income decrease. Households' income that came from business / self-employed is more likely to face decline in income. On the other hand households, expenditures are increasing for a variety of reasons. Due to the unexpected expenditure households had to spend more on healthcare and household items during the covid-19 period.

The results of leverage 2 explained that Covid-19 has an indirect negative but statistically significant impact on the debt-to-financial asset ratio. It is highly significant at 1% level of significance. The income volatility acts as a mediator between leverage2 and covid-19. Volatility makes it more difficult for Pakistani households to save, build assets, and plan for the future. In order to bridge the gaps in their finances, middle-income households turn to debt.

The results of leverage 3 exhibited that Covid-19 has an insignificant impact on the debt-to-physical assets of households. It is insignificant at a 10 % level of significance.

Total effect of SEM

The above table demonstrates that income volatility is negatively associated with household leverage (leverage1) and it is significant at 5% level of significance. Income volatility is obtained through the range coefficient ratio. In the first step, range1 is computed which is equal to the highest income level less lowest income level Then computed range2 this is obtained by adding the highest income level and lowest income level. Finally, income volatility is

acquired by dividing range1 to range2. The reason for the negative relationship between volatility and household leverage is that of more uncertain income of the households makes it difficult to borrow more money as compared to the predetermined income level of the households. Covid-19 is negatively associated with the debt-to-income ratio of households and it is highly significant at a 1 % level of significance. Because of this self-employed household were suffered more in the pandemic period than stable job holder households, as a result, the leverage ratio of self-employed households was decreased. Age of the household is insignificant at a 10 % level of significance.

Education of the household head is positively associated with the debt-to-income ratio and it is significant at 5% level of significance. The fact behind is that more educated households have been taken into higher debt. The justification of the positive association between household leverage and education is that households with higher education have better jobs which leads to higher income, as a result, the debt-to-incomes ratio of such households increases.

The positive association between household head education and household leverage is explained by the permanent income hypothesis, which states that education plays an important role in determining a household debt-to-income ratio. Households with a higher degree of education are more likely to have greater financial knowledge, job stability, and higher future earnings which allows them to accumulate a higher debt-to-income ratio.

The family system of households is negatively related to a leverage ratio and it is significant at a 1% level of significance. The reason behind this is that people who were living jointly participate less in household decisions than individuals who live in a nuclear family system. Joint families provided support to a family member not need to borrow from outside the family on the other hand, nuclear households were taken more debt. Region is insignificant at 10% level of significance. It is demonstrated that households that belong to rural area less participated in the debt-to-income ratio of households as compared to households that belonged to urban areas.

Interest rate is also negatively associated with a household leverage ratio and it is highly significant at 1% level of significance. The low-interest rate has been linked to more debt in households. As interest rates decreased, households increased their debt-to-income ratio significantly. When interest rates increase, households with a higher debt to income ratio reduce their expenditure more than those with a lower debt to income ratio. Average propensity to consume (APC) is derived by dividing the total annual consumption by their total annual income. APC is insignificant at 10 % level of significance. The dependency ratio (dep ratio) is insignificant at 10 % level of significance. While for leverage 2 Self-employed is positively associated with debt-to-income ratio and it is insignificant at 10 % level of significance. Income class has a negative influence on the debt-to-income ratio and it is insignificant at 10 % level of significance. The negative impact of income class illustrates that low-income household have been less participated in debt-to-income ratio as compared to middle-income class.

The results of the table for leverage 2 show that income volatility is negatively associated with debt-to-financial assets and it is highly significant at 1% level of significance. This means that as income volatility has been increased among households has led to a decline in debt-to-financial assets. Income volatility plays a significant mediator role by decreasing household leverage ratio indirectly. Covid-19 has an insignificant effect at 10% level of significance. The age of the household is insignificant at a 10 % level of significance. Education has a positive coefficient with debt to financial assets and it is insignificant at 10% level of significance. Family system has not significantly affected debt-to-financial assets. Debt-to-financial assets was found to higher among people living in the nuclear family system as compared to people living in a joint family system. Region is insignificant at 10% level of significance. The result indicates that the residents living in urban areas have higher debt-to-financial assets as compared to residents living in rural areas. Hence, people who belonged to urban areas are more educated and have higher financial assets as opposed to rural households. The interest rate is insignificant at 10% level of significance. At an interest rate increase, people avoid taking debt.

The average propensity to consume has a positive influence on Debt-to-financial assets and it is significant at 5% level of significance. Low-income households have a higher propensity to consume. The fact is that low-income households frequently participate in dissaving. They frequently deprive their disposable income of necessities and take out debt against their future earnings. The consumption expenditure of households was considerably increased on the other hand people have no sufficient money for finance their daily consumption this situation forced households to borrow money. Dependency ratio (Dep ratio) is positively associated with household debt-to-financial assets and it is significant at 1% level of significance. The dependency ratio is obtained by dividing the number of dependents by total family size. Households having more dependent demand more debt. Self-employed has negatively associated with debt-to-financial assets and it is significant at 10% level of significance. In comparison to regular workers, the income of self-employed households is more volatile. Self-employed households with failing

businesses have borrowed money from nonbank borrowers rather than banking institutions. This makes them more vulnerable to exogenous shocks of Covid-19 and higher interest rates. The estimation results showed that self-employed individuals have been borrowed more money as compared to regular workers. This is because regular worker households seem to earn substantially greater annual disposable income than self-employed households. Furthermore, self-employed households have faced difficulties in repaying debt which forced them to liquidate their possessions. The (PYF) is the personal income of household head by dividing the family size of the household head by a thousand. PYF has an insignificant effect at 10 % level of significance. The results of leverage 3 indicate that income volatility plays no mediating role between Covid-19 and Debt-to-financial assets of households. It is insignificant at a 10% level of significance. Covid-19 has also inversely impacted on debt-to-physical assets of households. Covid-19 has insignificant at 10% level of significance. The age of the households has a negative but significant influence on the Debt-to-physical assets of households. Age has significant at a 10% level of significance. In comparison to older households, younger households appeared to have taken out more mortgage loans. Because older households have enough savings to buy a house with their own money but younger households do not have enough money to buy durable items like a house. Due to the shortage of capital younger households preferred to borrow money to purchase homes.

The number of young people taking out mortgages has been steadily increasing. The current findings support the life cycle hypothesis which argues that people with insufficient savings are more likely to take a risk and invest when they are young. Younger households have used loans for investment purposes. Buying a home is seen as a large investment by the younger households. The purchase of a home gives young households a sense of self-sufficiency and responsibility resulting in increased leverage. There are various reasons for taking out debt at a young age, including the fact that the responsibilities of elder households differ from those of younger households. Because young household's heads have fewer responsibilities than elder's household thus, housing finance is more required by the younger household heads. In the early years of life, people work and earn money and their future wages are predicted to rise. The probability of future income increases is one of the factors used to decide the amount to be allocated to young households.

Education has no impact on debt-to-physical assets and it is insignificant at a 10% level of significance. The family system of household heads does not influence the debt-to-physical assets of households and it is insignificant at a 10 % level of significance. The region of the household head is negatively associated with debt-to-physical assets of households. It is significant at a 5% level of significance. The results indicate that the probability of being participated in debt-to-physical assets among households residing in rural areas is lower than compared of households residing in urban areas. The majority of households living in rural areas were illiterate, with insufficient awareness about bank credit facilities. As a result, debt demand among rural households has not increased considerably. Interest rate is negatively related to the debt-to-physical assets of households. It is significant at a 10% level of significance. The negative relation suggests that as the interest rate increases demand debt decreases. Households avoid borrowing money at a higher interest rate.

The interest rate is the premium that a lender charges to a debtor for borrowing money. It is usually represented as a percentage of the loan amount, represented annually. The regression confirms that low-interest rates are associated with higher household leverage. The results show that housing loans are available at low-interest rates, so the demand for housing loans at low-interest rates has expanded dramatically among households. Average propensity to consume (APC) has a negative but statistically significant influence on the debt-to-physical assets of households.

APC is significant at a 5 % level of significance. APC is the ratio of domestic expenditure to the personal income of the household head. The negative association indicates that as the Average propensity to consume of households has increased, the debt-to-financial assets of households decreased. As APC rises, household expenditure rises, and if household income remains constant, household savings decline, resulting in demand for debt, yet such households lack the financial ability to repay debt. Households were obliged to quit taking debt as a result of this situation. The dependency ratio (Depratio) of households is insignificant at a 10% level of significance. Self-employed has no impact on the debt-physical assets of households. Household personal income (PYF) is insignificant at a 10 % level of significance.

Table 3. Results of Hedonic Price Modelling

Lnph	Coefficient	Std. Error	t-statistic	P-value
Age	0.007542	0.002067	3.65	0.000
Floor	0.182354	0.067507	2.7	0.007

Size	0.042344	0.013772	3.07	0.002
Rooms	0.118594	0.028906	4.1	0.000
Street Width	-0.00495	0.00367	-1.35	0.179
2. Security wall	-0.2773	0.097888	-2.83	0.005
2. Corner plot	-0.0071	0.09968	-0.07	0.943
Material floor				
2	0.184392	0.113453	1.63	0.106
3	0.186159	0.370281	0.5	0.616
Material wall				
2	-0.07179	0.635725	-0.11	0.91
3	-0.7814	0.749822	-1.04	0.299
4	-0.29849	0.650122	-0.46	0.647
2. Material roof	-0.24645	0.093949	-2.62	0.009
Houconition	-0.2399	0.051827	-4.63	0.000
Disroad	0.088624	0.043471	2.04	0.043
Dispschool	0.032307	0.021189	1.52	0.129
Dispark	-0.02233	0.012453	-1.79	0.074
Dishospital	0.011755	0.012191	0.96	0.336
Disbank	-0.04022	0.015762	-2.55	0.011
Discenter	-0.01074	0.005326	-2.02	0.045
_cons	15.29999	0.652872	23.43	0.000

The semi-log simple linear regression analysis (hedonic model) has estimated by using an equation in which the log of house price (Lnph) is used as a dependent variable and House age, number of floors, size of a house in Marla, numbers of rooms, street width of the house, security wall, corner plot, material of the floor, material of walls, material of the roof, house condition, and distance variables are used as an independent variable. The coefficient of regression is directly employed to understand the association of variables with house prices as a result of regression analysis. As the above table shows age of the house is positively associated with the house price. It is highly significant at a 1% level of significance. As the age of the house increases, the property value will also increase. The older a house is, the more probable it was extensively improved at some point throughout its life. Housing maintenance like construction of the new kitchen, rooms, installation of an air conditioning system, and installation of a new roof is the most popular house improvement, thus leading to an increase in house price. The number of house floors is positively related to house prices. It is significant at a 1 % level of significance. The positive link indicates that the price of a property with multiple floors is higher than a house with only one story. Households have paid higher prices for properties with more floors. House size has a positive correlation with house prices. It is significant at a 1% level of significance. The positive relationship indicates that houses with more rooms have higher prices than houses with only one room, therefore, as the number of rooms in a house grows the prices of the property rise significantly. This also suggests that individuals are willing to pay a higher price for additional rooms in Faisalabad city. Street width of the house has no impact on house price and it is insignificant at 10% level of significance. Security wall has a negative effect on house prices and it is highly significant at a 1 % level of significance. The negative relationship indicates that households that lived in a house without a security wall around the street pay lower prices than those who lived in a house with security walls. As a consequence, homeowners are more prepared to pay for a safe home, resulting in an increase in secured home prices in Faisalabad. Corner Plot has no effect on house prices and it is insignificant at a 10 % level of significance. Material of the floor and material of walls have no effect on house price determination and both are insignificant at 10% level of significance. Material of roof is negatively associated with house prices. It is highly significant at a 1% level of significance. Households who lived in Lentered houses paid more than those that lived in non-Lentered houses. Because Lentered roofs are more expensive than non-Lentered roofs therefore households charged higher prices for Lentered houses.

House condition is negatively associated with house prices and it is highly significant at 1% level of significance. Households paid high prices for well-furnished houses as compared to unfurnished houses. Distance to the main road (Didroad) has a positive effect on house prices. It is significant at a 5 % level of significance. The positive

relationship indicates that houses located near the main road are worth more than houses located far away because property prices are higher near the main road. Distance to the public school (Dispshool) does not affect house price and it is significant at a 10% level of significance.

Distance to the public park (Dispark) is negatively but statistically significantly associated with house prices. It is significant at a 5% level of significance. According to the negative association households that resided far away from a public park paid lower housing prices than those who lived closer to a public park. This demonstrates that households are willing to pay more for houses near public parks. Distance to the public hospital (Dishospital) is insignificant at a 10% level of significance.

Distance to the bank (Disbank) is negatively associated with house prices. It is significant at a 5% level of significance. The negative relationship shows that households that lived far away from a bank paid lower house prices than those households that lived closer to a bank. This illustrates that people are willing to pay a higher price for a house near a bank.

Distance to city center (Discenter) is negatively associated with house prices. It is significant at a 5% level of significance. Distance to city center is measured in Kilometers. Property prices in the city center are higher than those at a greater distance from the residence and the city center. The negative relationship indicated that households living in houses located more distance from the city center had lower property values and paid lower house prices than those living in houses closer to the city center. People are more prepared to pay a higher price for a home in the city center because all facilities are available to residents. In this study, the city center clock tower of Faisalabad was used, therefore households that lived in Faisalabad city paid greater house prices than those who lived outside.

Table 4. Structural Equation Modelling on the sub-sample with Home value Misestimating as a control variable

Direct effect	Coefficient	Std. Error	z-Statistic	P-value
Covid	-0.66542	0.482843	-1.38	0.168
indirect effect	Coefficient	Std. Error	z-Statistic	P-value
Covid	-0.25163	0.218119	-1.15	0.249
Total effect	Coefficient	Std. Error	z-Statistic	P-value
Volatility	-0.72127	0.617841	-1.17	0.243
Covid	-0.91705	0.433351	-2.12	0.034
Age	-0.02717	0.018792	-1.45	0.148
Education	0.076985	0.037186	2.07	0.038
Family System	-0.76156	0.281185	-2.71	0.007
Region	-0.08222	0.355954	-0.23	0.817
Interest rate	-0.05142	0.014617	-3.52	0.000
Apc	-1.36338	0.806035	-1.69	0.091
Depratio	0.36965	0.54403	0.68	0.497
Self-employed	0.022169	0.365729	0.06	0.952
PY	-0.00361	0.001394	-2.59	0.01
PV	0.925752	0.273922	3.38	0.001

Direct Effect of SEM

The above table shows the association between the dependent variable (Leverage1) and the independent variable (Covid-19). It is demonstrating that Covid-19 has no influence on the debt-to-income ratio of households. It is insignificant at a 10% level of significance. The households that suffered more have more volatile income. Household leverage has been severely diminished among the households that have suffered the most. This is because business closures and unexpected lockdowns as a result of Covid-19 forced households to stay at home, resulting in a drop in household income which had a direct impact on household debt-to-income ratios.

Indirect Effect of SEM

The results indicate that there Covid-19 has no significant effect on household leverage (debt-to-income) and it is insignificant at a 10% level of significance.

Total effect of SEM

The above table shows the results of Structural Equation Modelling by using Home value misestimating as a control variable. Households often make the wrong estimation when self-assessing their home wealth. Some household overestimate their Home value and some households underestimate their home value. The real home value of households was calculated using the hedonic price model. A further semi-log hedonic price model is used to obtain predictive value. The results show that income volatility is insignificant at a 10% level of significance. Covid-19 has an insignificant at 10% level of significance. The age of the household is insignificant at a 10 % level of significance. Education is positively associated with the debt-to-income ratio of households and it is significant at a 5% level of significance. The fact behind this is that educated households have a certain future income so on the basis of high income they can easily avail of debt. Hence, the debt-to-income ratio among educated households is higher than compared of uneducated households. Family system is negatively associated with Debt-to-income ratio of households but statistically significant. The family system is highly significant at a 1 % level of significance.

The negative association indicated household heads living in joint family system less participated in the debt-to-income ratio as compared to households who were living in a nuclear family system. Because household heads living in a joint system are supported by the family members at a time of need thus their leverage ratio is significantly low then households living in joint family system. Region is insignificant at a 10% level of significance. The interest rate is negatively associated with debt-to-income ratio of households. The interest rate is highly significant at a 10% level of significance. The negative relation between household's leverage and interest rate shows that at a higher interest rate households avoid taking debt while on low-interest rate households were more likely to participate in household's leverage.

The average propensity to consume has a negative influence on the Debt-to-income ratio of households and it is significant at a 10% level of significance. The negative association indicates that as the APC increased the debt-to-income ratio of households decreed. The fact behind is that due to Covid-19 the sudden shock the income of households decreased but their domestic expenditure has been increased, they have no income to repay future loans so they significantly decreased their debt demand. Dependency ratio (Depratio) is insignificant at 10% level of significance. Self-employed is positively associated with the debt-to-income ratio of households and it is insignificant at 10% level of significance.

The per capita income (PYF) of household's head is negatively related to the debt-to-income ratio of households. It is significant at a 5 % level of significance. Per capital income is obtained by the personal income of household head by dividing the family size of the household head in thousand. The predictive value is positively associated with the debt-to-income ratio of households. it is highly significant at a 1% level of significance. The positive association indicates that house overestimate their Home value. The debt-to-income ratio has been increased among households who overestimate their Home value as compared to households who underestimate their Home value. Households that overestimate their home value provide the impression of having a larger property value which gives financial institutions confidence. Banks were more willing to lend money to households with greater Home value then to those with lower Home value.

Direct effect of SEM

The above table demonstrates the relationship between debt-to-financial assets of households and Covid-19. The results show that Covid-19 has a direct negative and significant effect on debt-to-financial assets.it is significant at 5% level of significance. The negative association implies that financially vulnerable households have significantly reduced their household leverage throughout the period of Covid-19.

In the Direct effect of SEM

The indirect results of covid-19 with an intermediation on volatility show that Covid-19 has an insignificant effect on debt-to-financial assets of households. It is insignificant at a 10% level of significance. It is seeming the more volatile income households have more deleveraged.

Table 5. Structural Equation Modelling on the sub-sample with Home value Misestimating as control variable

Direct effect	Coefficient	Std. Error	z-Statistic	P-value
Covid	-5.79264	2.5877	-2.24	0.025

indirect effect	Coefficient	Std. Error	z-Statistic	P-value
Covid	-1.21032	1.166296	-1.04	0.299
Total effect	Coefficient	Std. Error	z-Statistic	P-value
Volatility	-3.46925	3.311194	-1.05	0.295
Covid	-7.00295	2.321114	-3.02	0.003
Age	0.025812	0.100651	0.26	0.798
Education	0.052138	0.199173	0.26	0.793
Family System	-1.28428	1.506083	-0.85	0.394
Region	0.148243	1.906561	0.08	0.938
Interest rate	-0.14525	0.078294	-1.86	0.064
Apc	0.890164	4.317283	0.21	0.837
Depratio	9.842966	2.913934	3.38	0.001
Self-employed	0.177872	1.958917	0.09	0.928
PY	-0.02117	0.007464	-2.84	0.005
PV	1.934541	1.467179	1.32	0.187

Total Effect of SEM

The results show that volatility has an insignificant effect on debt-to-financial assets. It is insignificant at a 10 % level of significance. The total effect of Covid-19 has a significant and negative effect on household leverage. Covid-19 is highly significant at 1% level of significance. The negative association indicates that decline in household income caused by the Covid-19 pandemic influences on household ability to repay their debts. Late debt payments have a deleterious effect on a household creditworthiness, which reduces household leverage significantly. Age of the household head has no impact on household leverage. Education of the household head has no impact on debt-to-financial assets and it is insignificant at a 10% level of significance. Family system and Region also have no impact on household leverage and are insignificant at a 10 % level of significance. Interest rate has a negative and significant impact on debt-to-financial assets and it is significant at 10% level of significance. APC is insignificant and has no impact on household leverage. Dependency ratio (Depratio) is positively and significantly associated with debt-to-income ratio. It is highly significant at a 1% level of significance. The fact behind is that the dependency ratio increases as number of dependents increases. The increase in dependency ratio led to a considerable rise in household leverage. Self-employed ha not impact on household leverage. Per capita income (PY) of household has negative and significant impact on household leverage. This indicate that low per capita income household demand more debt. Predicted value has no impact on debt-to-financial assets.

Direct Effect of SEM

The above table shows the relationship between leverage3 (Debt-to-physical assets) and covid-19. The results indicate that Covid-19 has no impact on household leverage and is insignificant at a10% level of significance.

Indirect Effect of SEM

The results show that Covid-19 is negatively and significantly associated with debt-to-physical assets. Covid-19 is significant at a 10% level of significance. The significance shows that income volatility played a fully mediating role between Covid-19 and Household leverage. The negative association illustrate that more volatile income households have decreased their leverage ratio during a specific period of Covid-19.

Total Effect of SEM

The results show that income volatility is negatively and significantly associated with household leverage. It is significant at a 10% level of significance.

Table 6. Structural Equation Modelling on the sub-sample with Home value Misestimating as control variable

Direct effect	Coefficient	Std. Error	z-Statistic	P-value
Covid	-0.07002	0.063664	-1.1	0.271
Indirect effect	Coefficient	Std. Error	z-Statistic	P-value
Covid	-0.05217	0.029252	-1.78	0.074
Total effect	Coefficient	Std. Error	z-Statistic	P-value
Volatility	-0.14955	0.081464	-1.84	0.066
Covid	-0.12219	0.057388	-2.13	0.033

Age	-0.00109	0.002489	-0.44	0.661
Education	0.012142	0.004924	2.47	0.014
Family system	-0.14912	0.037237	-4	0.000
Region	-0.0574	0.047138	-1.22	0.223
Interest rate	-0.00815	0.001936	-4.21	0.000
Apc	-0.2285	0.106742	-2.14	0.032
Depratio	0.185951	0.072045	2.58	0.01
Self-employed	-0.0063	0.048433	-0.13	0.897
PY	-0.00027	0.000185	-1.47	0.142
PV	0.061918	0.036275	1.71	0.088

Thus, negative association indicates that more volatile income households significantly reduced their household leverage as compared to certain income households. Age of the household has no impact on debt-to-physical assets and insignificant at a 10% level of significance. The education of the household head has a positive and significant impact on household leverage. The positive relation shows that level of education increases the debt-to-physical assets ratio also increases. Family system is negatively and significantly related with household leverage. It is highly significant at a 1% level of significance. By means this household leverage have increased among nuclear households than households who lived in joint family system. The interest rate is negatively and significantly associated with household leverage. It is highly significant at a 1% level of significance. This indicate that as interest rates increased household leverage decreased. Average propensity to consume (Apc) is negatively and significantly related to household leverage. Apc is significant at a 5% level of significance. Dependency ratio (Depratio) has a positive and significant impact on household leverage. It is significant at a 1% level of significance. This illustrates that household heads have more dependent on their income significantly increased debt-to-physical assets ratio. Self-employed and per capita income (PV) of households have no impact on household leverage.

Predicted values (PV) is positively and significantly associated with debt-to-physical assets of households. PV is significant at a 10% level of significance. Predicted values is used to evaluate the extent of home value mis-estimation. The justification behind positive association is that household overestimate their home value and households is high among those households who overestimate home value. Household also make errors in estimating the worth their home; some household overestimate home value, while other underestimate home value.

CONCLUSION

Household leverages have increased briskly throughout the world and economic decisions are also influenced by it. In recent years, Pakistani households have experienced a dramatic increase in household leverages for house construction, auto loans, and emergency needs. In Pakistan, literature on household leverage is insufficient no exact data available on the size of household leverages.

Our findings suggest that households are more risk averters as they avoid taking loans with volatile income and if the income is affected by Covid-19 lock down. The household who over estimate their home value has significantly higher level of household leverage than those who under estimate home value.

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