



Macroeconomic Determinants of Housing Finance in Pakistan

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ABSTRACT

The concept of human welfare cannot be imagined without housing as it is one of the basic needs of human life. It is alpha and omega for social inclusion and standard of living. The persons need a house for a variety of reasons including protection, security, space and other services and utilities attached with the houses. The people who do not have adequate housing facilities may encounter many pitfalls. This study explains the macroeconomic determinants of housing finance in Pakistan based on quarterly data ranging from 2005Q1 to 2018Q4. Vital factors that influence the housing finance in Pakistan are interest rate, per capita income, urbanization and wholesale price index. Findings expose that the interest rate and wholesale price index are negatively while per capita income and urbanization are positively related to housing finance of Pakistan.

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1. Introduction

The growth rate of the population in Pakistan is two per cent per annum. Pakistan is at number sixth among the most populous countries in the world and is ranked as the third-largest country in South Asia. The population is closely related to urbanization as the population and urbanization increase, the demand for housing also increases that lift the need for housing finance. The housing sector in Pakistan is still underdeveloped as compared with other developed and developing countries but it has growth potential. The issues that are big threats to growth are high land prices, high rates of interest and high prices of construction material. According to World Bank Report, at least 65 per cent of Pakistani households have no hope of livable houses in near future because of shortfall of five million house units persists, this would lead to a new slum in major cities. Moreover, the new trend of single-family and a decrease in average household size are other major issues (Sabir, 2014).

In Pakistan, there is an acute shortage of housing, especially for lower-income groups which are an extensive part of the whole population. Although the government of Pakistan have made efforts to improve the conditions in the housing and housing finance sector but various constraints restraints the growth of the housing finance sector. Recent studies reveal that shortage of formal financial sources is a supply-side problem. The formal sector provides only 1 to 2 per cent of all transactions of housing, whereas the informal financial sector provides 10 per cent of all housing transactions in the country, although the informal sector is not properly regulated, especially in terms of consumer protection. The average maturity period and loan to value ratio have decreased from 2008 reflecting that housing finance is less affordable for salaried class and lower-income groups. The mortgage debt ratio to GDP has declined from 1.5% in 1994 to 0.4 % in 2018. In the last two quarters of 2018, growth in housing finance has lifted after 2008 due to a decrease in interest rate. It is expected that the SBP posture of reducing the policy rate would help to increase the demand and affordability of housing finance in Pakistan. Despite all the obstacles in the housing finance sector, the government of Pakistan and SBP have announced the National Housing Policy (NHP) in 2001 and Housing Advisory Group in 2008 respectively for the development of housing finance system and to develop resource mobilization strategy and to enforce effective laws (SBP, 2014).

The housing finance system of Pakistan has covered a long distance from the former stage of government dominance to the existing market-oriented system. Although the government and SBP have made great efforts to improve the condition of housing finance still there is a shortage of houses. Very limited studies on the key factors of housing finance as a whole for rural and urban areas have done. The present study is a pioneer study about the determinants of housing finance in Pakistan. The rest of the paper is structured as: The second section of the paper focuses on the broad literature review of the determinants of housing finance. Section three is about the model, data and methodology. Section four presents result and discussions. Section five elaborates the conclusion and policy recommendations.

2. Literature Review

There are various studies on housing finance that are multidimensional. An effort has been done to sort out the literature with related aspects under widely define areas. The empirical studies on housing finance can be discussed in following dimensions:

2.1. The Role of Borrowers Income on Home Loans

Various factors influence demand for housing finance such as borrowers' income, home loan interest rates and inflation rate. Gelfand (1970) examined the impact of credit terms and conditions on lower and middle-income group housing demand. Credit terms include interest rates, down payments and maturity period of the mortgage loan, and credit conditions. The study found that demand for housing was more sensitive to carrying charges in the credit conditions. Arcelus and Meltzer (1973) examined the positive influence of real income and the negative influence of rental price on housing demand. Further, Kirby (1976) analyzed that the supply and demand interface was vital for price creation as these prices allocate buyers to dwellings whose rate was matched by their income. By using the Brainard-Tobin portfolio approach, Rosa (1978) explored that mortgages increased with the rise of real disposable income, net worth and house prices. Dynarski and Sheffrin (1985) emphasized that the transitory income put a greater effect on the decision of the buyer to purchase a house.

Moreover, Sa-Aadu and Sirmans (1995) concluded that the borrower's choice among adjustable mortgage rates versus fixed-rate depended on the annual income plus percentage change in the income of the borrower. Srinavas (1996) stated the reasons for the non-allocation of loans by the commercial banks such as low level of incomes, low level of assets, uncertain incomes of urban poor. Similar results

were found by Saleh (1999) with the help of data collected through the multi-clustered sample of households, residents of Jakarta living in informal settlements. Hendershott et al.(2000) revealed that the elimination of interest subtraction resulted in borrowers lowering the first LTV ratio and this impact differed with loan size, tax bracket and household age. On the other hand, Quigley and Raphael (2004) examined that choice of housing mostly was based on the estimation of the stable income of household rather than on current income, because it would not possible for the household to regulate housing consumption by small variations in income. A further study was conducted by Bandyopadhyay and Saha (2009) and found out that almost 90 per cent of borrowers fit in the category of “employed”, and leftovers were either unemployed, self-employed or pensioners. Thamodaran (2014) pointed out that housing finance was a fundamental association in the potential for translating the social urban and housing investment creation into benefits and property strips for people including the low-income groups. Araujo et al. (2020) have observed that the limits of loan-to-value ration involves the challenges of identification because the inhibited borrowers are no longer observed directly after the policies have implemented.

2.2. The Role of Interest Rate on Home Loans

Interest rate is one of the most important factors in housing finance. Wallich (1971) stated that the elasticity for the housing finance demand in connection with interest rate may give the wrong impression in the way that elasticities to a great extent rely on debt services to income of borrowers. Further, Arcelus and Meltzer (1973) revealed that the interest rate and housing services rental price were the main determinants of housing demand, and they together had a negative effect. On the other hand, Smith (1976) developed a hypothetical model of a building of apartments and analyzed that the demand for housing increased due to a lower mortgage rate because it cancelled the effect of the high rate of inflation and wages rate. Kent (1980) examined the housing finance demand as a negative function of home loan real rates of interest. Green and Shoven (1986) showed that the interest rate was a crucial factor to determine the average age of prepayments. Consequently, it can also be observed that the effective time period to payment of mortgage loan depended on the interest rate. Clauretje and Herzog (1990) discovered that when the prices of property and interest rate increased, the losses on loans for lenders decreased. Khan (2003) reported that the high mortgage rates were the reasons behind the limited or almost no access to the finance for housing for the most of population in Pakistan. While Green and Wachter (2005) observed that mortgage insurance also played a key role in the growth of mortgage finance and had positively influenced both borrowers and lenders. Some researchers pointed out that the increased house prices fostered the need for greater housing loans, while the reduction in mortgage rates encouraged affordability. Further, the studies of Chandrasekar and Krishnamoorthy (2010) concluded that interest rate and availability of mortgage both put a significant positive impact on housing demand. Kumar et al. (2012) revealed that the interest rates of the home loan had a negative impact on home loan demand. Bhutta and Ringo (2021) analyzed the impact of the interest rate on buying the home and find out that binding DTI restrictions are the significant feature of mortgage market which intensify the influence of the shocks of interest rate.

2.3. Role of inflation and House Prices

Some authors reviewed the impact of inflation on housing finance demand. Titman (1982) evaluated that when the after-tax cost of capital decreased, and the purchase price of housing increased then the rental rates declined with an increase in anticipated inflation rates. Similarly, Boehm and McKenzie (1982) determined that inflation decreased the opportunities of homeownership by increased interest rates. The interest cost compensated for the positive effects of tax exemptions and capital gains. On the other hand, Reidy (1983) argued that the rise in inflation and interest rate worsen the housing industry condition while the results of Alm and Follain (1984) indicated that the reasonable increase in

the inflation rate encouraged housing demand because of compact user cost. Further, Renaud (1996) had a view higher inflation rate, higher interest rates and reduced wages were the individual key aspects that can restrict the housing demand. Zhang et al (2012) in their study, identified a few key prices and monetary variables in the interpretation of housing price dynamics, including, mortgage rate, real effective exchange rate, producer price and broad money supply. Khan et al. (2022) revealed a negative influence of urbanization, regressor age and real exchange rate on housing prices, while the positive effect of remittances, real interest rate and broad money on housing prices in Pakistan.

2.4. The Role of Terms and Conditions of Housing Finance

Besides the rate of interest and inflation, housing finance demand is influenced by different terms and conditions of home loans. Affordability is generally measured by user cost and house carrying cost with respect to the household's average income in a specific city. In this regard Hence, Chetterjee (1982) highlighted the difference of housing affordability in different groups of income by observing the effects of credit terms combinations, ranging from favorable to unfavorable. Pesando (1992) was also in favor of affordability as a critical factor to housing and indicated that the buying cost of a house can be determined by the terms of credit such as rate of home loan, terms of the contract, loan-to-value ratio and home price and they were closely related to housing affordability issue. Further, Buckley (1994) recommended with respect to India, that housing finance demand must be analyzed by considering the effect of significant holdings of precious metals and gold in the country, which increases the probability of household's portfolio of adjustments to positively affect household's repayment capacity and down payment. Furthermore, Taylor and Jureidini (1994) explored with the help of ratio analysis that in Australia the requirements of repayments for female borrowers were constantly higher over 10% than for males. In the USA, He (2000) found from the period of 1975-2000 that returns of stocks adjusted by the inflation were a significant effect on the borrower's ability to gather money for the payment of mortgage and to qualify for the housing loan. Canepa and Khaled (2018) reported that household fragility, as well as housing affordability, significantly influences the bank loan risk during providing attention towards the household indebtedness and housing affordability role. Moreover, Agnello et al. (2019) indicated that a movement towards the more liberalized mortgage sector is linked with long housing booms, while a rise in securitization is associated with short bursts of housing.

2.5. Development of Market-Based Housing Finance

Numerous studies have been carried out on housing finance and most of them favor the market-based housing finance system. Out of which, Chen and Gao (1993) observed that initiation of steady devolution and mixing of the market system into a pivotal planned system resulted in positive and significant changes in China's housing scenario. Also, the boom in housing construction owing to decentralization and expansion of housing finance. On the other side, Order (1994) evaluated that the intervention of government in the sector of housing finance increased after Great Depression and it would be more sensible to consider it differently in the present situation. Similarly, Garg (1998) also considered that government should play a promotional role despite involving in the direct provision of housing units. Moreover, Uy (2006) emphasized the establishment of a liquid and active secondary market of housing mortgage and believed that such market is important for the development of sustainable and viable sources of housing finance for the long term period. Warnock and Warnock (2007) revealed that proper credit information system and well improved legal rights positively impact the size of the housing finance market while the instability of macroeconomic had a negative impact and suggested that the lending of long term funds is more positively effective if the country is in a position of an efficient liquidity crisis management system. Warnock and Warnock (2008) posited on the role of government in primary markets will be important for improving the management risk as well as costs of transactions in the market of housing finance and priming that the market to become an

important part of capital markets. Nenova (2010) find out that the smooth operation increases the efficiency of the housing finance market and the supply of housing units increase by the availability of finance which in turn enhances the borrower's ability to fulfil their dream of better housing.

3. Model, Data and Methodology

A model in research is the abstraction and representation of actual situations or objects. It depicts the interrelationship between different factors and variables in terms of cause and effect. Research methodology is a systematic way to solve any problem. Every researcher needs to design the methodology as it provides the working plan of the research. Appropriate data collection is important to sustaining the integration of research. The selection of accurate data collection instruments and understandable instructions for their use can reduce the chances of occurring of errors.

3.1. Model Specification

This section examines the determinants of demand for home loans. The model shows the impact of macroeconomic variables on demand for home loans.

Model: Macroeconomic Factors and Demand for Home Loans

The objective of the model is to examine the impact of macroeconomic variables on demand for home loans. The functional structure of the model is given below:

$$\ln(DHL) = f(INT, PCI, URB, WPI) \quad (1)$$

Equation (1) defines the functional form of the model where demand for home loans consider as a dependent variable and interest, per capita income, urbanization, wholesale price index and trends are independent variables. We are using a log-linear model, the econometric form of this equation is described as:

$$D_{HL} = \delta_0 + \delta_1 INT + \delta_2 PCI + \delta_3 URB + \delta_4 WPI + \varepsilon \quad (2)$$

Where:

Ln(DHL) = Log of Demand for Home loans (Disbursement Amount Million Rs)

INT = Interest rates (Weighted Average Interest rate %)

PCI = Per Capita Income (National Income/Population)

URB = Urbanization (Urban Population/ Total Population)

WPI = Wholesale Price Index (in Percentage)

3.2. Data: Sources and Definition

Data collection is the most important part of the research. The validity and reliability of data depend on the sources and type of data. This section comprises sources of data collection. Data collection techniques used in this research is purely secondary, which is second-hand data that has been collected for some other purpose. Data was collected from different sources and the main sources of data for this research were: Quarterly reports of housing finance from 2005Q1 to 2084Q4 published by the State Bank of Pakistan and World Development Indicators (2017).

3.3. Research Methodology

The existing study is descriptive-empirical by nature. The methodology includes an extensive literature review and inductive reasoning applied to observed data on factors that are assumed to be linked with housing finance. The investigation of the study starts with an extensive review of the structure, issues and growth of the housing finance sector in Pakistan. The second part of the research is empirical analysis. To check the stationary of time series data utilized ADF test. Bound testing is used to check the presence of the long-run relationship. ARDL approach employ for the estimation of

parameters and to determine the cointegration utilized error correction Model.

4. Results and Discussions

4.1. Descriptive Statistics and Correlation Analysis

The results of descriptive and correlation analysis have been expressed in Table1 and 2.

Table 1: Descriptive Statistics of Key Variables

	DHL	INT	WPI	URB	PCI
Mean	1401.31	13.65	96.05	36.05	84665.88
Median	1555.50	13.47	90.17	36.00	81421.68
Maximum	4315.00	17.30	151.93	38.02	134244.3
Minimum	22.59	9.92	50.60	34.26	36417.31
Std. Dev.	1295.81	2.26	33.90	1.12	30773.37
Skewness	0.31	-0.23	0.14	0.10	0.13
Kurtosis	1.92	1.94	1.54	1.80	1.63
Jarque-Bera	2.58	2.22	3.67	2.44	3.20
Probability	0.27	0.32	0.15	0.29	0.20

Table 1. demonstrates the descriptive statistics of all the selected variables for this study over the period 2005Q1 to 2018Q4. The mean value of DHL is 1401. Among all the variables PCI indicates the highest average value which is 84665. The maximum and minimum values of DHL are 1555.5 and 4315 respectively. Like mean value, PCI also have the highest maximum and minimum values among all the variables. As standard deviation is the dispersion measure which indicates that from its mean value how much data differs. High S.D means the great dispersion from the data while low SD means low dispersion. Among the selected variables DHL and PCI show the greater dispersion having values 1295.8 and 30773.3 respectively. Other variables elaborate less dispersion.

To explain the asymmetry from the normal distribution is a statistical data skewness is used. The positive and negative skewness rely on the data points if data is right-skewed it means it is positive skewness and if data is left-skewed it shows negative skewness. The skewness value of DHL is 0.31. Among all the variables only one variable INT has a negative value of skewness that is -0.23. Moving towards Kurtosis which measures whether the data is light or heavy-tailed to a normal distribution. All variables in Table 1 indicates the kurtosis values less than 3 (platykurtosis) that requires normal distribution.

Table 2: Correlation Matrix of Key Variables

	DHL	INT	WPI	URB	PCI
DHL	1.00				
INT	0.60	1.00			
WPI	0.84	0.54	1.00		
URB	0.74	0.51	0.96	1.00	
PCI	0.80	0.53	0.99	0.99	1.00

As correlation indicates the degree of association between the variables hence, Table 2. presents the matrix of correlation of all the selected variables. DHL elaborates perfect correlation with DHL because with its variable there exists a perfect correlation. DHL have a positive correlation with INTT, WPI, URB and PCI but this correlation is moderate with INTT and strong with the rest of the variables. Further, INTT exhibits perfect correlation with its variables and positive and moderate correlation with

the rest of the variables. On other hand, WPI shows a positive and strong correlation with URB and PCI. URB also have the same situation.

4.2. ADF Test

In Table 3, the results of our ADF test has been presented. Table 3 investigates the integration order of all the variables we have used in our analysis by applying a unit root test based on ADF to inquire about the stationarity and non-stationarity of the data. Based on ADF, the variables used in this study have been checked for stationarity and non-stationarity with two types of equations i.e. intercept and intercept and trend.

Table 3: Results of ADF

Unit Root Test on Level							
Variables	Intercept	Lags	Intercept and Trend	Lags	None	Lags	Conclusion
DHL	-0.40 (0.88)	1	-4.79 (0.00)	0	2.24 (0.98)	0	I(1)
INT	-3.84 (0.05)	0	-2.04 (0.09)	0	4.30 (0.05)	0	I(0)
PCI	0.22 (0.97)	5	-2.64 (0.26)	5	0.91 (0.90)	5	I(1)
WPI	-0.81 (0.79)	9	-1.67 (0.73)	9	0.39 (0.79)	9	I(1)
URB	-1.17 (0.67)	1	-4.98 (0.00)	0	-0.04 (0.66)	0	I(1)

The findings shows that INT is integrated of zero-order i.e. I(0) and the rest of the variables are integrated of order one i.e. I(1). This study, therefore, uses the technique of ARDL cointegration to analyze the relationship among variables.

4.3. Bounds Testing

OLS technique employed to test the long-run relationship existence before investigating long-run coefficient and error correction model and for locating Wald statistics or F value. For this reason, Schwartz Bayesian Criterion (SBC) is employed that determines the optimal lag length and maximum lag length in the ARDL model. The results of F-statistics at different significance levels are given in Table 4.

Table 4: The F-test for Cointegration

Equation	F-Statistics	5% Level of Significance		10% Level of Significance	
		I ₀ Bound	I ₁ Bound	I ₀ Bound	I ₁ Bound
DHL/INT, PCI, URB, WPI, TRD	3.66	2.56	3.49	2.2	3.09

Table 4 illustrates that the computed value of F-statistic is 3.66 which is greater than the value of upper bound I(1) at 5% and 10% level of significance. In this way, the null hypothesis indicates that no long-run relationship exists, rejected, and alternative hypothesis which signifies that long-run relationship exists accepted.

4.4. Long Run Estimation Results

After developing the long-run relationship next stage is to investigate the parameter and locate the values of the long-run coefficient of the ARDL model. To estimate the relationship between macroeconomic factors and demand for home loans specified five variables. Demand for home loans is a

dependent variable and interest rate (INT), per capita income (PCI), urbanization (URB), wholesale price index (WPI) are explanatory variables. Table 5 depicts the results of the long-run model.

Table 5: ARDL based Long Run Results of Macroeconomic Factors and Demand for Home

Dependent Variable ln (DHL)				
Variable	Coefficient	Std. Error	t-Statistic	Probability
INT	-0.977613	0.289251	-3.379806	0.0022
PCI	0.095367	0.049625	1.921744	0.0628
URB	1.557303	0.106278	14.65317	0.0000
WPI	-0.272097	0.076177	-3.571903	0.0013
TREND	-2.553490	1.262304	-2.022881	0.0527

Here we discuss the determinants of housing loans. The first economic factor is the interest rate as it is expected prior that as the interest rate increases, demand for home loans decreases. The investigated parameter of INT is negative and significant as depicted by Table 5 it means a 1% increase in interest causes a 0.97% decrease in demand for home loans which recommend that more loans for housing are demanded at lower rates of interest. It gives powerful evidence for the former expectations that housing loan demand act as per the law of demand relating to cost variable, i.e., interest rate. According to the Loanable theory of interest rate as the interest rate rises, the demand for loans decreases that causing the downward sloping of the demand curve of Loanable funds, the theory we have discussed in section 2. Kent (1980) also examined the housing finance demand as a negative function of home loan real interest rates.

The second economic factor is per capita income. In Table 5 income parameter shows positive and significant results that specify a 1% increase in PCI instigate 0.09 % increase in demand for home loans. It can be said that income has a strong effect as compared to the interest on the demand for home loans. For the borrowers, more important is the ability of monthly repayment ability that is directly related to the income of the household. As households cannot affect the interest rate charged on home loans, they can adjust the maturity period and income to suit their debt servicing ability which is primarily determined by the level of their income. Income is also an important determinant of housing demand in the sense that housing loan has always been a long tenure as compared to other types of loan so the impact of income is more than other variables on the decision of household about the home loan. Girouard et al. (2007) and Gyntelberg et al (2007) empirically showed that as the income of the household increases their demand for loans increases because they can afford more borrowings.

The third variable is urbanization. The migration from rural to urban areas due to job searching, better education facilities, health facilities, rising trend of the nuclear family and increasing ambition of homeownership is the reason for the expansion of cities. As the land prices are rising day by day this also compels the households to find out the housing options in the outer edges of cities. Another trend is increasing which is weekend homes or second homes for some investment purpose. The mixed effect of all these factors is evident in the rapid speed of urbanization. To capture this impact ratio of urban population to total population has been used. The result shows the positive and significant impact of urbanization on demand for home loans. Table 5 illustrates that a 1% increase in urbanization causes a 30% increase in the demand for home loans. Empirical results demonstrate that the rapid increase in urbanization as apparent by the increased construction of housing units in the cities and extension of cities positively influence demand for home loans. It can also observe that rise in urbanization has a positive effect on the sectoral share of home loans in aggregate credit that is extended by the banking sector as well.

The fourth variable is the wholesale price index in the model. This is used to describe the impact of inflation in housing prices on the demand for home loans. Results in Table 5 depict the negative and significant impact of housing prices on housing demand. It shows that a 1% increase in WPI causes a 0.27% decrease in demand for home loans. However, it can also be seen that housing price directly impacts the decision of the type of house purchase rather than on the demand for housing and it can also observe.

Various reasons could be accountable for the effect of housing prices on the demand for home loans. Firstly, when the interest rate and housing price are expected to increase then the impact of household prices would depend on the comparative strength of change in every variable. The small increase in the prices of the house would increase the housing demand for given values of expected and current incomes and interest rates. But if there will be a sharp and sudden increase in the housing price that will decrease the demand for home loans because this increase in prices would discourage and compel the household to reduce the purchase activity of housing, specifically to lower-income groups. With the rapid pace of urbanization that is increasing the need for purchasing the house, it can be seen house prices has a positive impact on the demand for housing loans in the medium and long term but the stability in house prices is very important for the growth and expansion of housing finance sector.

4.5. Error Correction Results

The error correction technique researchers used to locate the adjustment speed for equilibrium restoration in the dynamic model. ECM reveals how slowly or speedily variables are convergent in the direction of equilibrium. The negative value of ECM indicates significant results.

Table 6 depicts that the estimated value of ECM is equal to -0.485 which suggests that in the long-run equilibrium there will be a short-run shock which is adjusted by half within one year.

Table 6: Error Correction Results of Selected ARDL Model of Macroeconomic factors and Demand for Home Loans

Dependent Variable ln (DHL)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(INT)	-0.355447	0.217525	-1.634054	0.1134
D(INT(-1))	-0.544947	0.272314	-2.001171	0.0552
D(PCI)	0.000357	0.000075	4.786399	0.0000
D(URB)	17.810644	12.400805	1.436249	0.1620
D(WPI)	-0.172461	0.051929	-3.321118	0.0025
C	-507.703375	120.104883	-4.227167	0.0002
ECM(-1)	-0.485720	0.115248	-4.214578	0.0002

So, on the whole, the result recommends that adjustment speed is fairly high and it would restore equilibrium quickly.

5. Conclusion and Policy Recommendations

This study has aimed to investigate the determinants of housing finance in Pakistan over the period 2005-2018. This study finds out that the interest rate influences demand for loans negatively and this finding is matched with loanable funds theory. Wholesale price index also has a negative effect on demand for loans. Other sectors such as; per capita income and urbanization inserts positive impact on demand for loans for houses. From this study some policies have recommended for the development and expansion of the housing finance sector in Pakistan. i.e. the liberal policy of interest rate for a home

loan would make it possible for the borrower to fulfil their housing demand.

For the advancement and proper expansion and growth of housing finance, Pakistan needs to exert full attention on strengthening the infrastructure of the mortgage market. Additionally, the population of urban areas in Pakistan is neglected despite the fact it consists of 80% of the urban population. A systematic and organized scheme needs to be developed to encourage the builders of housing schemes to build houses according to the need of all income classes. The loan application procedures such as foam filling and processing should be easy and borrower-friendly.

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