Which Indonesian Home Purchasers Seek Mortgage Finance?

Raymond J. Struyk*
National Opinion Research Center, Bethesda, MD; NORC, 4350 East-West Highway, Bethesda, MD, USA; Email: Struyk-ray@norc.org.

Nilesh Patel
Department of Sociology at the University of Chicago, Chicago, IL

The incidence of taking a mortgage loan from a commercial bank or cooperative for home purchase is sharply lower in developing than industrialized countries. Indeed, the common approach for achieving good quality housing is for a family to construct and improve a dwelling over a number of years. At the same time, it may be possible for formal lenders to expand the volume of mortgage lending by marketing mortgage loans better tailored to those more prone to seek them. This analysis is based on a representative survey of households intending to purchase a dwelling in the next three years with a final sample size of 1,281 conducted in 2008 in Indonesia's seven largest metropolitan areas. We find that those more likely to seek such loans are families who already have an established relationship with a bank or cooperative, professionals and those with higher permanent incomes, and those with greater knowledge of mortgage loans. These factors all contain important ideas to assist lenders in targeting mortgage lending marketing campaigns.

Keywords

Mortgage; Housing finance; Developing countries; Southeast Asia

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* Corresponding author

1.   Introduction

In industrialized countries, the ability to borrow funds to finance housing investment is generally a key determinant of whether a family can afford to become a homeowner. Formal housing finance, i.e., mortgage loans provided by regulated institutions, plays an extremely important role in actualizing potential housing demand. Competition among lenders is keen to offer loan products that meet client preferences.[1]

On the other hand, in developing nations, while formal finance sometimes plays a significant role, it is often not the primary means of realizing adequate housing. Rather, incremental unit construction financed through savings or short-term borrowing is typically the dominant path to eventually obtaining a unit of minimum acceptable quality.

Without access to formal finance, households who wish to purchase a completed good quality home with a clear land title must wait until they have amassed sufficient savings by themselves or obtained a loan from members of their extended family, friends, or a developer (installment sales involving a large downpayment during the construction period and installments beginning during this period and continuing for several years after completion with the owner holding the title until all payments are made). The problems with non mortgage finance are that not everyone has access (e.g., a family member who has the capital to make the loan or an employer who will do so), the cost of funds is often high, and in the case of installment sales from developers, there is uncertainty about receiving a unit after large deposits have been made.[2] Hence, a prominent policy goal is to expand access to mortgage finance, and thus accelerate the rate of housing improvement.

This article focuses on the decision of Indonesian home purchasers to take a loan from a formal financial institution or otherwise finance their homes. It presents information from a 2008 representative household survey on the financing plans of Indonesian households who live in the nation's seven largest metropolitan areas and plan to purchase a dwelling in the next three years. Since only families who indicate that they were planning to purchase completed units are included, as opposed to beginning or continuing incremental construction of a dwelling, respondents are expected to be in the upper part of the income distribution.

The balance of the article is organized as follows. The next section gives a quick overview of urban housing in Indonesia. Section 3 provides a conceptual framework. The fourth section describes the data employed in the analysis. The fifth section presents information on four sets of would-be home purchaser characteristics that are

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[1] A fine example of a lender working to position his bank to expand market share is in Knight (2006).
[2] For information on traditional patterns of housing finance in developing nations, see for example, Lall (1985), Struyk, Hoffman, and Katsura (1992), Mayo (1983).

important background for the subsequent discussion of mortgage finance, including: family attributes; assets and debts; financial experience, e.g., having taken loans from a licensed lender and possession of a credit card; characteristics of the dwelling unit that they plan to purchase; and knowledge of mortgages.   The sixth section presents estimated logit models of the choice to take a mortgage loan to finance the dwelling purchase or use some combination of cash and informal borrowings. The final section offers some conclusions.

2.   Urban Housing in Indonesia

Indonesia's urban areas were expanding rapidly at about 800,000 households per year during the 2000-2004 period; a growth rate of over 3.5 percent. A substantial majority of urban housing is constructed incrementally, with the 70 percent of urban dwellings being owner-occupied (Hoek-Smit, 2006; Struyk, Hoffman, Katsura, 1990). Development of informal dwellings (those that do not meet official building regulations, located in areas that are laid out not meeting official standards or both) is facilitated by private developers laying out new sub-divisions with rights-of-way reserved for future road and infrastructure installation where plots are sold with the possibility of registration (Struyk, Hoffman, Kasura, 1990).

Formal mortgage finance has had a modest role in the country. In 1996, the outstanding mortgage debt was 3.1 percent of GDP, but lending declined sharply after the financial crisis initiated in 1997. In 2005, the ratio stood at only 1.8 percent (Hoek-Smit, 2005). This is similar to the figures for Algeria, Saudi Arabia, Pakistan, Turkey and Ghana, and much lower than India's 5 percent. In contrast, the parallel figures for the U.S. and EU-15 were about 65 and 46 percent, respectively (Chiquier, 2006).

In fall 2007, mortgage loans from commercial banks were very predominantly variable interest rate loans (VRMs), typically with the first adjustment occurring after the loan is active for 1-3 years. Interest rates on these variable rate products were about 9.5 percent annually; the few fixed rate loans on offer had rates about 200 basis points higher. Mortgage interest is not deductible from income taxes. Inflation was 6.6 percent.[3] Maximum loan-to-value ratios (LTVs) were in the 70-80 percent range. Loan terms were as long as 15-20 years. The popularity of VRMs with lenders resulted from the losses they suffered during the 1997 financial crisis when the cost of liabilities accelerated while outstanding fixed rate mortgage loans did not reprice.[4]

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[3] Inflation rose to 12 percent in 2008 and interest rates rose during the year as well (IMF, 2008),

[4] An overview of the Indonesian housing finance sector can be found in Hoek-Smit (2005). Islamic Finance for housing has a marginal role.

The Bank Tabungan Negara (BTN), a specialized government-owned housing bank, was the traditional pace-setter for residential mortgage lending before the 1997 financial crisis, offering both subsidized and market-rate mortgage loans and controlling over half the market (Struyk, Hoffman, and Katsura, 1990). However, by 2005, private banks held a larger share of mortgage credit (49.1 percent) than the BTN (37.7 percent), with the balance divided between regional state banks (11.8 percent), and foreign and joint Indonesian-foreign banks (1.2 percent) (Hoek-Smit, 2006, p.30). The shift results from a combination of expanded private lending and lower originations by the BTN. All together, mortgages financed about 193,000 developer-produced single family houses in 2005, of which about 42 percent were subsidized loans from the BTN which concentrates on financing new units (Hoek-Smit, 2006, p.42).

3.   Conceptual Framework

Analyses of home purchase finance choices in industrialized nations have focused on the attributes of mortgage loans and have not included wider options, e.g., pure cash purchase. They have also relied on data on actual mortgage transactions, rather than stated preferences of consumers.

Follain (1990) reviews the research on choices for a range of mortgage attributes: LTV, instrument type (fixed rate, variable rate, etc.); the trade-off between a higher interest rate and up-front interest payments (points); and decisions on prepayment and default.[5]

A recent analysis of mortgage loans taken out by low- and moderate-income borrowers in the U.S. casts a borrower as selecting a particular mortgage loan that is broadly defined to include the following inter-related attributes: loan amount, note rate, speed of closing (government insured loans take longer; sub-prime are quick), the likelihood that the lender will not require full income documentation, and LTV (LaCour-Little, 2007). The use of loan data from sub-prime as well as prime loans makes the range of mortgage products included wider than in the typical analysis. The findings are that borrowers are highly rational, avoiding higher-priced alternatives; LaCour-Little also finds that credit scores and other risk factors are highly predictive of contract choice. Selection of sub-prime products is explained in part by idiosyncratic factors, including high levels of borrower debt, the lack of full income documentation for the self-employed, and a need to close the loan quickly.

For developing countries, analyses have focused on the choice among broad alternative financing options. The options are a pure cash purchase, perhaps including informal borrowing from friends and the extended family, and purchase

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[5] Other relevant studies include Courchane et al. (2004), Campbell and Cocco (2003), Breslaw et al. (1996), and Brueckner and Follain (1988).

with finance from a formal lender. Struyk, Katsura and Mark (1989) analyze the choices among alternatives in Jordan, Struyk and Turner (1986) for Korea and the Philippines, and Struyk and Roman (2008) for Egypt.

This analysis follows that done by Struyk and Turner (1986) of the determinants of which households receive mortgage financing from formal institutions, as opposed to alternative sources of funds, for dwelling purchases in Korea and the Philippines. The framework employed can be briefly summarized as follows. The demand for a particular source and quantity of housing finance is jointly determined with tenure choice, the demand for housing services, and demand for housing assets as an investment. Struyk and Turner do not develop an explicit theoretical model. The theoretical model developed by Henderson and Ioannides (1983) comes closest to this structure; this formulation treats tenure choice, housing consumption, and the demand for housing assets as jointly determined and incorporates uncertainty of future returns and housing prices. Ultimately, Struyk and Turner compose a single equation reduced from a model for estimation in which the choice of the source of financing for dwelling purchase depends on variables indicated in their conceptual framework and the determinants of housing consumption and tenure choice documented in the literature.

Thus, the choice of financing source, S_1, by household j depends on the factors determining the quantity of assets and services demanded (A_j, H_j) and the prices of alternative financing packages ($P_1 \ldots P_n$). The quantity of asset demanded is seen as especially important in determining the choice among sources if some sources, such as friends and relatives, are limited in the amount that they can be expected to lend. The most complex consideration concerns "the" price of different packages; the complexity arises both from the multifarious nature of the explicit financial conditions involved and because of the implicit obligations (such as making future loans in turn) that can be incurred if borrowing is from family or friends.

The supply of finance available to a particular household can depend on almost idiosyncratic factors. One factor might be whether households belong to particular groups that get priority for financing from a particular source, e.g. government employees for a government-sponsored program that assures access to a mortgage loan. Likewise, the value and other attributes of a property (such as lack of clear title or the unit being constructed of substandard materials) may disqualify it from some sources, but not others. The presence of such requirements means that the supply function of a given source of financing is defined for a household only after it has satisfied various conditions. Hence, one can envision a situation in which the existence of a supply curve itself is a function of the characteristics of the borrower and the property that s/he wishes to buy (B_j, PR_j). Thus $S_1 = s (B_j, PR_j)$. When viewed in the aggregate, the supply function for each S_1 seems discontinuous. Such discontinuity renders any general statements about the availability of funds difficult and makes standard specifications of the supply curve impossible.

The simplified, reduced-form model actually estimated by Struyk and Turner is of the form:

$$S_1 = f(A_j, H_j, PR_j, P_1 \ldots P_n)$$
$$\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots$$
$$S_n = f(A_j, H_j, PR_j, P_1 \ldots P_n)$$

where each S_i is a binary variable taking on the value of 1 if the ith source is used. The price terms (P_1) are represented by mortgage terms and a series of variables that reflect a household's ability to meet the not strictly economic criteria for receiving a loan. Determinants of A_j and H_j are substituted for these variables; such variables include the household's economic position, demographic characteristics, and the expected return on housing investment. The operational definitions of these factors are discussed later, along with a further consideration of the anticipated role of these variables which is complicated by some variables, such as income appearing in more than one function summarized in the reduced form model.

4.   The Survey and Questionnaire[6]

The primary objective of the survey is to determine the home purchase loan preferences of Indonesian families residing in the nation's seven largest metropolitan areas who intend to purchase a dwelling in the next three years. These areas include Greater Jakarta (Jakarta, Bogor, Depok, Tangerang and Bekasi), Surabaya, Medan, Makassar, Bandung, Semarang and Denpasar.

4.1.   Sample

The family planning to purchase could be a whole household (led by a primary family), or a family within the household (a secondary family) who will move out when it buys a unit. It is possible that more than one family unit within a household will be planning to purchase a dwelling in the near term. The family could currently be a homeowner or renter. The survey targeted moderate-to-high income households who are more likely to purchase completed units rather than engage in incremental dwelling development which is defined as those falling within the highest 30 percent of the income distribution.

The 2000 Census was used as the sample frame. The approach was to employ a multi-stage stratified random sample with a multi-way stratification design and clustering to select the sample. The stratification variable used at the first stage consists of provinces. Therefore, in the first step, aggregate census data were retrieved for the provinces of interest where each province represents a stratum.

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[6] A full description of the sampling and weighting procedures along with basic data tabulations is provided in Struyk (2008).

Greater Jakarta is sub-divided into 5 main districts within this level of stratification, giving a total of 11 strata.

The number of villages (clusters) selected within the strata was assigned based on proportional allocation. The definition of "village" applies to the general description of villages in Indonesia, which is a region occupied by a number of people under the lowest government level, led by a sub-district head. A village is entitled to organize its own local culture under a system of the national government. Within each of the 11 provinces, the villages were sorted in an ascending order using 2006 poverty headcount information available for each village. Then, the top X number of villages (highest income) was included in the sample. The poverty head count was used as an economic status indicator of the villages because better income and socio-economic data are not available for each village.   A sample of 124 villages was drawn.

The proportional allocation of the sample is based on the proportion of the population living in each of the 11 provinces. Typically, once a sample of "villages" is selected from these provinces, a random sample is drawn of census blocks or neighborhoods selected within these "villages" using more detailed census block or similar data. In our case, a method ensuring more up-to-date information than the 2000 Census was used.

Villages are divided into Rukun Warga (hamlet or further referred as RW).[7] RW is an administrative unit under a village, and villages have anywhere between 2 to 10 RWs depending on their density. The number of inhabited RWs was recorded by the field staff who then randomly selected 2 from which households to be interviewed would be selected. The number of households within each RW was not available before the selection of the RW in the sample. For each RW, the interviewer accessed an up-to-date list of residing households and randomly selected 40 households (addresses) to conduct interviews. The final step was to screen households contacted, conducting interviews only with those stating that a family in the household intended to purchase a fully completed dwelling within the next three years.

A target sample of 888 completed interviews was defined to base a confidence level of 95 percent with an alpha of 5 percent, i.e., a 5 percent chance that we reject a true value of the variable of interest. The sample size depends on the variance in a key variable within the population of interest. We identify the most important variables (questions) of the study for this purpose. One of the key questions where we wanted high power for testing the proportion is:

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[7] Note that in small villages, we have Rukun Tetangga (Neighborhood or further referred to as RT) instead of RW.   In other areas outside Jakarta, RW is referred to as "dusun" or "kampung" or "lingkungan", which represent a group of houses as part of the village. In the following parts, anything that applies to RW will be treated the same for RT, dusun, kampong, and lingkungan.

"Does the first or second statement better fit your thinking?

1. It is really important for me that the payment I make on my loan will be the same every month so I can plan on it. Changes in the interest rate and the monthly payments, especially an increase, would be a big problem.
2. If the interest rate on the loan is lower for the first 1-2 years (and so the monthly payments are lower, too), then I would accept that the payments could change later if in general interest rates in the market changed; my payments could go up or they could go down. "

Thus, the sample size was determined by the power of testing a binomial proportion. Based on expert opinion, if one assumes that the proportion in the population is expected to be around 30 percent in favor of equal payments and that in order for it to be within policy range we can tolerate an allowable error of +/- 10 percent, then a sample of 888 was required.

The total number of completed interviews was 1,281 from contacting 8,756 separate households. This is rather more than expected, owing to a higher than anticipated completion rate. We had expected that about 10 percent of those contacted would both be eligible (planning to purchase a dwelling in the next three years) and agree to be interviewed. In fact, the average (unweighted) completion rate was 16 percent. Interestingly, in 164 households, it was a family other than the primary family who said that it was planning to purchase a unit in the next three years. (The "second families" are included in the 1,281 sample size.)

4.2.   Questionnaire

The questionnaire gathered comprehensive information on household composition so that family units within the household could be identified and the income of each person properly allocated to a family. Information on the current housing situation was gathered at the household level along with questions on the method of financing for the purchase of the current dwelling if the unit was owner-occupied. For each family unit that reported plans to purchase a dwelling in the next three years, there were batteries of questions on the type of dwelling that they wished to purchase and its location, the ways that they intended to finance the purchase, their connection with formal financial institutions through savings or demand accounts, prior loans, and credit cards; a series of questions on loan product preferences; and questions designed to assess their knowledge of mortgage loans. The questions on loan product preferences did not explicitly ask about "mortgages" because there was some concern that not all of those intending to borrow from a formal lender would know the term, and therefore, its use could lead to confusion.

5.   Purchase Plans and Purchaser Characteristics

5.1.   Purchaser Plans

The survey data represent a population of 199,000 families who indicate intentions to purchase a dwelling in the next three years. A very important question is the share of families that plan to borrow to do so. As shown in Table 1, 49 percent of purchasers or 97,500 families, plan to take a loan. Thirty-six percent plan to use their own resources to pay cash for the unit. The remaining purchasers plan to pay cash with help from their employers, or families and friends.

Table 1   Broad Plans for Financing Home Purchase

Respondent reporting that this option best describes his/her plans	Percent Naming This Option
Buy it with a combination of down payment and a loan	49
Buy it with cash with my own resources	36
Buy it outright with cash with help from my family or friends	10
Buy it outright with help from my family and/or friends	5

Where do those who will borrow to purchase their units plan to get their loans? Table 2 presents two types of information on this point. First, respondents planning to borrow were asked where they were thinking of borrowing funds. They could name as many sources as they wished. The percent naming each source is recorded in the second column. Secondly, they were asked which would be the single most important source. The percent naming each source is in column 3.

Table 2   Where Home Purchasers Plan to Get a Loan

Loan Source	Share Naming This as One of Possibly Multiple Sources[a]	Share Naming This as Most Important Loan Source
Commercial bank	.55	.52
Cooperative	.14	.05
Private developer	.07	.05
Money lender	--	--
Family and friends	.25	.16
Employer	.20	.14
Other	.08	.07

a.   As multiple answers are permitted, the column entries sum to more than 1.0.

Commercial banks are by far the most important planned source of funds, with 55 percent of borrowers citing it as one source and 52 percent citing it as the most important source. Family and friends, and employers are the second and third sources, but with only 16 and 14 percent, respectively, naming them as the most important source.

Commercial banks and cooperatives are regulated mortgage lenders, and together they account for 57 percent of the estimated primary loans, or 55,800 loans. The other loan sources are unregulated, and for some, such as families, friends, and employers, there may be significant non interest payment obligations associated with getting a loan, for e.g., an employer may demand that the worker sign a contract to work 5 more years with the firm.

Compared to other countries for which roughly similar information is available, this is a high share from formal sources. In 2002-2006, only about 25 percent of households in Cairo used such financing (Struyk and Roman, 2007), and in three Jordanian cities in 1983, the share was about the same (Struyk et al., 1989, p.27). The figures for Cairo and Jordan are for actual experience, not plans. Differences in survey methods, geographic coverage, and actual experience versus plans limit these comparisons.

5.2.   Purchaser Characteristics

The information assembled provides a rich data set to address the questions of interest. In Table 3, we present the more important variables derived from the survey information, *excluding* those dealing specifically with borrowing for home purchase. The variables are collected into five groups: family characteristics, assets and debts, financial experience, characteristics of the dwelling unit planned for purchase, and indicators of purchaser knowledge of mortgage products.

The table shows the mean value of each variable for two groups of respondents: those who said they planned to finance their dwelling purchase using a mortgage (MORTGAGE) and those who would use some other financing form (OTHER). An asterisk, "*," next to the mean in the MORTGAGE column indicates that there is a statistically significant difference between the means of the two groups. These differences shed light on the characteristics of Indonesian families who are predisposed to take a mortgage for home purchase, i.e., lenders' primary market. Those not so disposed may become so if they receive further education about such loans.

Throughout this discussion, the data presented are estimates for the population of those planning to purchase a unit. The emphasis is on differences between would-be home purchasers who plan to take a loan to finance their purchase, and those who do not. As we do not have comparable data for all families, we cannot address questions of the ways that would-be purchasers compare with families who are not currently preparing to enter the housing market.

Table 3   Characteristics of Prospective Home Purchasers and Desired Properties, by Plans for Financing Their Purchase (weighted responses)

Short name	Characteristic	MORTGAGE	OTHERS
	Family characteristics		
AGE	Mean age of family head – years	40.0*	38.8
FEMALE	Share of families where head is a woman	.07	.05
FMLY-SZE	Mean no. of persons in family	4.17*	3.89
	Schooling of family head—percent distribution of highest completed level		
ED1[a]	primary school or less	.07*	.11
ED2	junior high	.12	.16
ED3	senior high	.45	.46
ED4	higher education	.36*	.27
LABOR[a]	Employment status of family head : Share not employed	.01*	.04
	Occupation of family head—percent distribution		
EMP1[a]	In the military	.01	.02
EMP2	Civil servant, Gol I or II	.03	.02
EMP3	Civil servant, Gol III or IV	.10*	.03
EMP4	Works for Gov bank or firm	.02	.03
EMP5	Self-employed or employer	.35	.36
EMP6	Employee of private firm	.47*	.54
	Employment type of family head—percent distribution		
OCC1[a]	Professional, technical or related	.21	.17
OCC2	Managers or administrators	.02	.03
OCC3	Clerical and similar workers	.02	.02
OCC4	Sales or service worker	.34	.34
OCC5	Farmer	.01	.01
OCC6	Production, transport equipment operators, etc.	.14*	.20
OCC7	Other	.26	.23
	Type of living arrangement of respondent (percent)		
PRIMARY	Nuclear household or primary family in a complex household	82*	90
SECOND	Family living within a complex household who is not the primary family and planning to move out when unit is purchased	18*	10

Short name	Characteristic	MORTGAGE	OTHERS
	Tenure of primary families – percent distribution		
OWN	Owns unit	63	66
RENT	Rents unit	20	20
OFFICAL	Government provided/official unit	2	2
DWL-OTH	Other	15*	11
INC	Mean family income[d]	5,601*	4,716
HEAD-INC	Mean share of family income from head's primary employment	.84	.87
HEAD-VER	Mean percent of head's income that can be verified	.73	.71
	Metro area of respondent – percent distribution		
	Greater Jakarta	.42*	.62
	Surabaya	.13	.13
	Medan	.06	.06
	Makassar	.13	.10
	Bandung	.11*	.04
	Semarang	.09*	.03
	Denpasar	.06*	.01
	Assets and Debts		
	Share of families who own		
VESPA	Motorcycle or vespa	.84*	.78
INTERNET	Internet access at home	.14*	.08
WASH	Automatic washing machine	.50*	.39
COLOR-TV	Color TV	.99	.98
DISH	Dish receiver	.04	.04
COMPUTER	Personal computer	.44*	.34
WTR-DISPN	Water purifier/dispenser	.63	.59
OTH-DWL	Own urban residential property	.14	.11
PROPERTY	Own commercial property	.04	.05
RUR-DWL	Own rural dwelling	.22	.19
URB-LAND	Own urban land	.06	.07
RUR-LAND	Own rural land	.23	.23
GLD-JWRY	Own gold or jewelry	.75	.71
	For families who own an asset, the number owned		
CAR	No. of cars owned	.56*	.34
MOB-PHON	No. of mobile phones owned	1.76	1.87

Short name	Characteristic	MORTGAGE	OTHERS
A/C[b]	No of window A/C units	.50*	.33
	Financial experience		
	Debt status		
LOANS	Where family is creditor: percent to whom others own money	.23	.22
	Where family has debt[c]		
DEBT	Share of families who owe money	.28*	.18
DEBT-AMT	Mean amount of money owed[d]	4,163*	1,291
	Banking relationship and financial experience		
ACCOUNT	Share of families with a bank account	.77*	.64
	Share of families with an account at specific types of banks; account at		
BANK1	BPD or BPR	.20*	.10
BANK2	Other commercial bank	.85*	.90
BANK3	Cooperative	.08	.06
BANK4	Other type of bank	.02	.02
BORROW	Share of families who have borrowed in past	.59*	.34
	Share of families who borrowed at specific types of lenders; loan from		
BRW1	Commercial bank	.41*	.16
BRW2	Cooperative	.20*	.13
BRW3	Other formal lender	.09*	.04
BRW4	Informal lender	.08	.07
	Other indicators of financial experience		
CRDT-CARD	Share who has a credit card	.19	.15
LIFE-INS	Share who have someone in the family covered by life insurance	.32*	.17
	Type of dwelling sought		
	Dwelling design – percent distribution		
DWL-TYPE	Single family unit on its own plot	93	91
	Preference for new unit – percent distribution		
NEW	Prefers new unit	85	84
PREV	Prefers previously occupied unit.	9	10
NO-PRF	No preference	6	6

Short name	Characteristic	MORTGAGE	OTHERS
ROOMS	Mean number of rooms	5.90*	5.41
BEDS	Mean number of bedrooms	2.87*	2.73
SIZE	Mean number of square meters	99*	90
	Location preferences		
SCHL-CLSE	Share for whom being close to schools is very or somewhat important	.92	.93
WORK-ACCES	Share for whom good access to work is very or somewhat important	.86*	.77
STAY	Share that plans to stay in general area	.872	.810
PRICE	Mean price of unit they plan to purchase[d]	138,262*	118,076
	Mortgage Knowledge		
NO-KNOW	Share that had no knowledge of mortgage loans[e]	.27*	.37
COLLAT	Share that knows dwelling serves as collateral for the loan	.45	.42
TITLE	Share that knows that the seller must have title to the property to obtain a mortgage	.80*	.86
FORECLOS	Share that knows that foreclosure is penalty for not making payments.	.40	.40
OCCUPY	Share that knows can occupy unit immediately with a mortgage rather than waiting most or all of the loan is repaid	.81*	.70
HOLD-TITLE	Share that knows that the borrower holds title during the loan period	.36	.43
MRT-KNOW	Sum of values for the previous 5 variables.	2.06*	1.57

a.   For family head.
b.   Excludes those with central air conditioning.
c.   Excludes loan for current dwelling, if any.
d.   In thousands of Rupiah.
e.   The specific question was: Have you ever heard of a mortgage loan? I mean, do you have any knowledge of this type of loan?
* Difference in means is significant at the .05 level or greater.

5.2.1. Family Attributes and Assets and Debts

The broad theme with respect to these characteristics is the general similarity of those who intend to borrow from a bank or cooperative and those who do not. There is only a modest number of statistically significant differences between the two groups, but some of these give important clues as to why certain families are planning to borrow from a formal lender. Those of particular interest include the following.

First, with respect to education and employment, the family head of those planning to take a formal sector loan are better educated than others: 36 percent of them have a higher education versus 27 percent of others (ED4). Only 1 percent of those planning to borrow from a formal source are unemployed versus 4 percent of others (LABOR). Also, those planning to borrow from formal sources are about as likely to be self-employed as others. On the other hand, higher level civil servants (EMP3) are significantly more likely to be planning to borrow from a formal source (10 versus 3 percent), consistent with a long standing pattern of this group having favored access to mortgage loans.[8]

Secondly, regarding family status, 18 percent of those planning to borrow are families that are part of larger complex households that they will leave when they purchase a unit, compared with 10 percent of those making other financial arrangements (SECOND).

Thirdly, regarding economic status, those who are planning to borrow, report higher incomes. Additionally, with respect to asset holdings, borrowers are significantly more likely to report much higher ownership rates of Vespas (VESPA), washing machines (WASH), computers, cars, and air conditioners.

5.2.2. Financial Experience

The information in the panel of Table 3 labeled "Financial experience" demonstrates that borrowers have significantly greater experience than those not planning to borrow from formal sources as measured in a variety of ways.

Compared to those not intending to borrow, those intending to borrow have a higher incidence of indebtedness: 28 versus 18 percent (DEBT). Their debt is also about three times as large on average (DEBT-AMT); a higher incidence of holding a bank account (77 versus 64 percent) and higher incidence of accounts at commercial banks; higher incidence of having taken out a loan (BORROW-59 versus 34 percent); and someone in the family covered by a life insurance policy (32 versus 17 percent - LIFE-INS).

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[8] Struyk, Hoffman, Katusra, 1990, pp.165-6

All of the above are attributes that lenders could use to target mortgage loans to clients with good prospects of borrowing. A profitable strategy for lenders should be cross-selling mortgage loans to clients who hold savings accounts with them, or have taken other kinds of loans and hold credit cards.

5.2.3 Type of Dwelling Sought

There are few differences between the preferences of likely formal borrowers and others for major dwelling attributes, such as unit type (single-family versus other), desire for access to schools and work, a new versus existing dwelling, and desired dwelling size. However, likely formal borrowers are seeking on average, units with about one-half an additional room and significantly more expensive units (Rp.138,000,000 versus Rp.118,000,000), a factor that could well make them more dependent on taking out a loan.

5.2.4 Mortgage Knowledge

How knowledgeable are Indonesian home purchasers about mortgage loans? The survey asked respondents if they knew anything about mortgages, and then, for those who said they did, 5 additional questions about the basic features of a mortgage (table panel labeled "mortgage knowledge").

NO-KNOW records the share of those who said they had no knowledge of mortgages.   About 27 percent of those intending to take a mortgage said they really do not have knowledge of this loan instrument, as did 37 percent of other would-be purchasers.

With the exception of answers to questions about whether the seller must hold title to sell a unit that will be financed by a mortgage (TITLE) and when a borrower can occupy his unit (OCCUPY), this pattern of fairly low knowledge levels is repeated in the rest of the table.   This response pattern is similar to that documented in a 2007 survey of would-be home purchasers in Cairo (Struyk, 2007).

Overall, those intending to take a mortgage identified mortgage conditions more accurately and significantly more often than others with 2.06 versus 1.57 correct answers out of a possible 5. This is expected since members of this group are really planning to take such a loan and yet still indicates that even those intending to use a mortgage do not understand basic features of these loan instruments.

6.   Determinants of Mortgage Choice

This section presents the results of estimating logit models of the decision to take a loan from a bank or cooperative, where the dependent variable is 1 if the family plans to use such a loan as the primary finance for its dwelling purchase, and zero otherwise.

Following the concept presented in the second section, independent variables from 7 groups were included in models. For the family's economic position as indicated by its income and asset holdings, the hypothesis is that higher income families may be better able to qualify for a formal sector loan, but at the same time, those with very high incomes may not need to borrow from a formal lender. Greater physical asset holdings indicate greater permanent income, and these families will have an easier time qualifying for the loan. Also, those with greater assets may have lower savings, and therefore, a greater need to borrow.   Hence, we expect these factors to have a positive effect on loan choice.

As for underwriting characteristics, we expect that the greater the share of the family's income earned by the family head, the more likely it is to qualify for a loan since lenders may discount income from other earners. As well, the greater the share of the head's income that can be verified, the more likely the family will qualify for a loan, and similarly with the income of other family members. Moreover, certain occupations, such as military, civil service, and self-employed, may be viewed by lenders as particularly stable or volatile.

Our expectation is that higher priced units, holding income and assets constant, mean that the likelihood that the family will need to borrow is greater.

The family's demographics, particularly the age of the household head and size, are hypothesized to play a role. Younger households may be more knowledgeable and less concerned about carrying a long-term debt than older borrowers. Larger families may have a greater need to borrow because of higher "core living expenses."

Greater experience with financial institutions is expected to increase the propensity to take a mortgage loan. Indicators of experience include having a savings or demand account, taken a loan in the past, possessing a credit card, and having life insurance coverage for someone in the family. These are all indicators of greater contact with financial institutions, and therefore, greater knowledge of various products and greater confidence to take a loan.

Knowledge of mortgage attributes is expected to increase the likelihood of planning to borrow. Finally, location, i.e., the metropolitan area where the family lives, is anticipated to have an influence, but not one that is easily characterized. Thus, a series of dummy variables for the provinces control for other factors which are not explicitly included in the model which are specific to the location.

From the variables listed in Table 3, it is evident that we have multiple indicators for most of these factors. In estimating the logit models, we have experimented with different specifications. Due to the large numbers of independent variables, and hence the presence of multicolinearity, even though the pair-wise correlations are low among variables included in each model, the significance of many coefficients is sensitive to model specification.

The final model is presented in Table 4. Its selection was based on the degree of consistency of the direction of causality of the independent variables with expectations and the degree of significance. The columns present for each variable, the estimated coefficient (B), and the coefficient transformed to give the mean effect on the probability of the respondent selecting to finance with a loan from a bank or cooperative.[9] We focus on the probabilities.

The model gives a good picture of the classes of variables that are robust among the models.   In particular, variables from three groups have consistent strong performances, including: income and assets, financial experience, and mortgage knowledge. With respect to economic position, the pattern is for asset variables to have a positive significant effect on the decision to borrow; the specific asset variables that are significant varied somewhat with model specification. The general insignificance of family income, in both linear and quadratic specifications, is attributed to a combination of misreporting of income by respondents and the importance of permanent, over current income, in the decision. Higher permanent income households are more likely to seek a loan from a formal lender.

Financial experience is a powerful determinant of the decision to seek a loan from a bank or cooperative. A family with a bank account is 17 percent more likely to seek such a loan, and a family that has borrowed from an institution in the past is 19 percent more likely to do so.

Three mortgage knowledge variables are significant in different models. The effect of such knowledge, while significant, has a modest impact on the decision. In Table 4, knowing the correct answer on when the family can occupy the unit if purchased with a mortgage increases the probability of seeking a loan by about 1 percent.

Certain occupations and types of employment increase the likelihood of seeking a loan from a bank or cooperative. Among occupations, holding a technical or related position increases the likelihood by 41 percent over a farmer. Civil servants are generally more likely to plan to borrow, in part presumably because in the past they had favorable access to mortgage loans from the state housing bank.

Also important are the classes of variables that are not significant. The family characteristics that would be of interest to the loan underwriter do not play a role in determining whether the family is interested in taking a mortgage. In some ways, this is expected, unless the respondent has quite deep knowledge of the mortgage origination process. However, the responses to the mortgage knowledge questions indicate that this is not the case. Family demographics do not have an impact on the family's financing decision. Less expected, neither does the price of the unit that the family plans to purchase. Our expectation was that as dwelling price rose, so would the need for taking a loan.

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[9] The formula is p * (1-p) * B, where p is the mean value of the dependent variable.

Table 4   **Results for Final Logit Model**
(dependent variable = 1, if family plans to borrow from a commercial bank or cooperative to finance its home purchase)

Variable Label	Description	B	Mean effect on probability
	Family-Underwriting characteristics		
	Occupation		
OCC1[a]	Professional, technical or related	2.071*	.414*
OCC2	Managers or administrators	1.420	.284
OCC3	Clerical and similar workers	1.193	.239
OCC4	Sales or service worker	1.662	.332
OCC6	Production, transport equipment operators, etc.	1.670	.334
OCC7	Other	1.735	.347
	Employment		
EMP1[b]	In the military	-.4456	.091
EMP2	Civil servant, Gol I or II	.7952*	.159*
EMP3	Civil servant, Gol III or IV	.6524*	.130*
EMP4	Works for Gov bank or firm	.3896	.078
EMP6	Employee of private firm	.2900	.058
FUH-status	Respondent is the family head	.0058**	.011**
	Income and assets		
INC	Family income (100,000 Rp.)	-.0027	C
CAR	Number of cars the family owns	.3712**	.074**
WASH	Family owns a washing machine	.2872	.057
	Financial experience		
ACCOUNT	Family has a bank account	.8507***	.170***
BORROW	Family as borrowed from an institution in the past	.9708***	.194***
	Mortgage knowledge		
OCCUPY	Respondent knows that one can occupy the unit immediately with a mortgage rather than waiting until most of the loan is paid	.0588**	.012**
	Summary statistics		
	Log likelihood		-351
	LR chi2		95.9
	Sign of chi2		.000
	Pseudo R2		.120
	n		653

a.   Omitted category is farmer.
b.   Omitted category is self-employed or employer.
c.   .0005 or less
*   significant at the .10 level or higher;
**   significant at the .05 level or higher;
*** significant at the .01 level or higher

Finally, after controlling for the other variables, the metropolitan area where the respondent lives does not exert an influence. The model does not control for the availability of mortgage loans across regions, and this result suggests that this factor may not be at work, i.e. respondents believe that such loans are locally available.

7.   Conclusion

The incidence of taking a mortgage loan from a commercial bank or cooperative for home purchase is sharply lower in developing than industrialized countries. Indeed, the common approach to achieving good quality housing is for a family to construct and improve a dwelling over a number of years. At the same time, it may be possible for formal lenders to expand the volume of mortgage lending by marketing mortgage loans effectively to those more prone to seek them.

The analysis in this article is based on a representative survey of households intending to purchase a dwelling in the next 3 years, with a final sample size of 1,281 conducted in 2008 in Indonesia's 7 largest metropolitan areas. It is explicitly designed to learn more about the home purchase finance plans of respondents. This information can be exploited to expand the market for mortgage loans.

In particular, we find that those more likely to seek such loans are families that already have an established relationship with a bank or cooperative. In other words, cross-selling should be a lender priority. Since professionals and those with higher permanent incomes are more likely to seek loans from regulated lenders, they should be targeted as well.

Importantly, those with greater knowledge of mortgage loans are more likely to seek loans from formal lenders. This fact points to the need for greater consumer education about mortgages, including among those who already hold accounts or have taken loans with banks and cooperatives.

It is unclear the extent to which these results apply to other countries. At their broadest level, they are consistent with results from earlier studies of the determinants of mortgage loan choices in other developing countries. Hence, the lessons for targeting marketing activities to expand mortgage lending may apply more broadly.

Acknowledgement

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