SOCIAL HOUSING FINANCE IN COLOMBIA

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Abstract

In this paper we explore the role played by policy instruments on the access to housing finance of low-income households. We also analyze the impact of housing credit and subsidies on the quality of life and the quality of dwelling of the beneficiaries. Using the Quality of Life Surveys conducted in Colombia in 2003 and 2008, we find that policy instruments aimed at easing access of low-income households to affordable housing such as subsidies and guaranteed loans have played a modest role in increasing the use of mortgage as a source of funding. Despite this, we show that subsidies have had a significant impact on both the quality of dwelling and the quality of life. Therefore, this paper suggests promoting the use of both instruments by improving their design and targeting.

Executive Summary

This study focuses on the access to housing credit by the low-income population. The main objective is to determine the role of housing subsidies and partial credit guarantees on the access to mortgage of low-income households. Additionally, this study analyzes the impact of housing credit and subsidies on the quality of life and the quality of dwelling of their beneficiaries.

In Colombia housing deficit is still high (36.4%) and approximately 97% of the households facing this deficit belong to the lowest income segments. Housing deficit is mainly qualitative (23.8%) and the most widespread problem among the poorest families is lack of access to sewerage, followed by lack of access to proper drinking water networks. This situation is associated with low levels of housing finance. Mortgage portfolio in Colombia amounts to around 3% of GDP, while the Latin American average is close to 5%.

The literature on housing finance in Colombia suggests that the main obstacles to increase access to housing loans are related to low income, lack of information on borrowers' ability to pay, high costs of recovering collateral, mortgage interest rates rigidities and judicial insecurity.

The main policy instruments addressing these obstacles are social housing subsidies and partial credit guarantees. The social housing subsidy, created in 1991, has been one of the main instruments of the social housing policy. It is a one-time direct subsidy to partially fund the purchase of affordable housing. The partial credit guarantees to social housing loans, implemented in 2004, address the obstacles of lack of collateral and costly collateral recovery.

In this paper the beneficiaries of both housing subsidies and credit are characterized using data from the Quality of Life Surveys from 2003 and 2008 (QLS). From 2003 to 2008 the percentage of subsidy beneficiaries belonging to the three lowest income quintiles increased from 65% to 80%. However, in 2008 only a third of the subsidy beneficiaries were classified as poor according to the Index of Unsatisfied Basic Needs (UBN). Credit access for the poorest population is even more difficult. More than 60% of the holders of housing loans belong to the two highest income quintiles and only 11.8% are classified as poor by the UBN.

The impact of housing subsidies and credit on the quality of dwelling and quality of life are estimated through the method of propensity score matching, using data from the QLS. The determinants of access to housing subsidies and housing loans are estimated following the two step simultaneous estimation model of Maddala (1993).

The results suggest that the social housing subsidy and housing credit improve the quality of dwelling and the quality of life among its beneficiaries, and is mainly assigned to low income populations. Though, the subsidy fails to facilitate access to credit and has insufficient coverage among the poorest segments of the population, in part because they lack complementary funding. Evidence confirms the importance of collateral and income as determinants of access to credit.

The partial credit guarantees program is focused on backing low income housing credits, but its use by financial intermediaries is very limited. The determinants of holding a partial mortgage guarantee were estimated through a probit model, using data from a private bank. Results show that there is a significant relation between the likelihood of holding a guarantee and having low income levels and low education levels.

Contents

1 Introduction

Housing deficit in Colombia remains high (36.2%[1]) despite the recovery of the sector after the crisis of the late nineties. The literature suggests that formal housing in Colombia is constrained, among other factors, by land markets failures, lengthy and costly procedures to obtain building permits and low access to credit.

Housing finance in Colombia is small compared to Latin American standards. Mortgage loans ranged from 3.0% to 3.5% of GDP during the last five years, while the regional average is around 5%[2]. After the financial crisis of the late nineties, which lasted from 1998 to 2001, the Colombian mortgage market recovery has been weak. While the ratio of total loans increased from 23.8% of GDP in 2001 to 46.2% in 2008, mortgage credit dropped from 6.2% of GDP in 2001 to 3.5% in 2008.

Mortgage lending in Colombia funds less than a third of total housing, while the rest is financed by informal lenders or self-funded. Mortgage lending is concentrated in the formally employed segment, leaving out 70% of social housing demand[3], comprised of households that earn their living from informal activities[4]. The problem of labor informality, which reaches almost 65% in Colombia, is behind the housing deficit and the lack of credit, because standard financial instruments don't suit the particular needs of this population.

The Colombian literature has identified two main constraints to the access to credit, especially by low-income people. First, even though poor families usually manage to accumulate a significant amount of capital over the years by self-building, they may not have access to credit because loan providers perceive a high risk of default from borrowers with low and volatile income (Galindo and Lora, 2005). In the same line, Galindo and Hofstetter (2006) found that at the microeconomic level interest rates are high due to the high credit risk assumed by lenders. Second, the supply of social housing credit is also constrained by the lack of collateral owing to

[1] According to the National Department of Statistics (DANE) in 1993 the effective housing deficit was 53.7%, dropping to 36.2% in 2005.

[2] Warnock and Warnock (2008)

[3] "Ciudades Amables" in National Planning Department (2005)

[4] Rocha, Sanchez and Tovar (2007), estimate that a formal employee has a higher probability of accessing to housing credit than an informal employee.

deficiencies in deed registration and high costs and length of recovering the collateral (Cardenas and Badel, 2003).

To promote the provision of social housing in Colombia, the government has implemented a number of instruments including tax exemptions, partial credit guarantees, direct subsidies and rediscount credits. However, the scope and effectiveness of these instruments have been limited. As mentioned above, housing access to the poorest segments of the population is still significantly low. The program of subsidies for social housing is the most important, providing direct and one-time subsidies to home buyers. It is expected that the subsidy facilitates access to credit. Another instrument aimed at increasing access to credit is the partial credit guarantees to social housing credit, which tends to address the obstacles related to lack of collateral and costly collateral recovery.

This study focuses on the access to housing credit by the low-income population. The main objective is to determine the impact of public policies addressed to stimulate social housing. Emphasis is placed on the effect of housing subsidies and partial credit guarantees on the access to mortgage of low-income households and on the impact of subsidies on quality of life and quality of dwellings.

The document is organized as follows. Section 2 presents a brief literature review of the housing credit in Colombia. Section 3 illustrates the main features of the social housing market in Colombia, as well as further details of the program of housing subsidies. Section 4 focuses on the characteristics of housing policy instruments and regulation. Section 5 discusses the impact of subsidies and credit on the quality of life and the quality of housing. Section 6 provides a summary of the characteristics of the loan guarantees program and its effect on easing credit access. Finally, the main conclusions are drawn in Section 7.

2 Literature Review

The housing sector in Colombia has been widely studied, with papers focusing on the mortgage markets and particularly on social housing finance.

Rocha, Sanchez and Tovar (2007) suggest that informality, low income and lack of information on borrower's ability to pay are the main barriers to access to credit by the low income population. According to the authors, the probability of getting a mortgage loan increases

when households have been granted a subsidy, have high income, work in the formal sector and hold programmed saving accounts. They also point out that loan providers perceive that income instability of informal workers leads to high risk of nonpayment and, therefore, limit their exposure to this population. They recommend promoting appropriate mechanisms of information sharing, such as programmed savings, which signal the capacity of making regular payments to the financial system. In the same line, Murcia (2007) use the Quality of Life Survey of 2003 to analyze the socio-economic determinants of access to mortgage loans and credit cards and find that the probability of having a mortgage loan increases by 11.7% for households in the higher quintile of the income distribution. This probability also rises if the household has a housing subsidy or if it is located in urban areas.

Cardenas and Badel (2003) suggest that high costs of recovering collateral and judicial insecurity work against access to credit in Colombia. They also point out that the financial crisis of the late nineties in Colombia was a consequence of the drop in housing prices and a significant increase in the value indebted by households, which deteriorated the loan to value ratio in the market.

According to Jaramillo and Cuervo (2009), the interest rate ceiling for housing loans is a costly rigidity for the mortgage markets. Loan providers have low incentives to supply social housing loans at the regulated rate, since these loans are risky, small, and their administrative costs are high.

Among the studies focused on policy instruments for promoting the social housing market, Cuellar (2006) presents a thorough analysis of the regulatory framework evolution and its incidence on housing finance development.

The National Planning Department of Colombia (2007) evaluates the Urban Social Housing Subsidies Program. The evidence shows that assets ownership, education level, and access to information determine access to the program. According to this study, the program has a positive and significant impact on the house and neighborhood physical conditions, as well as on the beneficiary households' expenditure and savings. However, it does not estimate the effect of the subsidy on the access to housing finance.

Finally, Marulanda, Paredes and Fajury (2006) calculate the fiscal cost of the partial credit guarantees on mortgages, as well as the fiscal cost of tax exemptions designed to promote

social housing supply. The authors indicate that these policy instruments are disperse and lack a result based orientation, limiting their impact.

3 Social housing market in Colombia

3.1 Characterization of the Housing Deficit

Housing deficit in Colombia was 36.1% in 2005, of which 12.4% was quantitative - that is they lacked a house - and 23.8% was qualitative –that is they lived in inadequate housing[5]. According to the Quality of Life Survey (QLS) of 2008, the housing deficit slightly decreased, to 34.6% (3.9 million households). Among these households, 68.0% belong to the first two income quintiles and their household heads are male (77.0%), with no education or only primary education (72.5%), are informal workers (78.0%) and live in cohabitation (45.8%).

In regards to the quality of dwellings, among the poorest households the most widespread problem is the lack of access to sewerage: 61.8% of households in the first income quintile and 43.7% of households in the second income quintile. Next in importance is the lack of access to water networks: 40.4% and 28.8%, in the first and second income quintile respectively, lack this service (Table 1). In addition, according to information provided by QLS on floor and wall materials of each house, among the poorest households the most common materials are bricks and cement. However, some houses in the first income quintile are still built out of adobe, zinc, cloth, cardboard and other disposable materials (6.2%) and have dirt floors (19.7%) (Table 1).

3.2 Evolution of Housing Construction

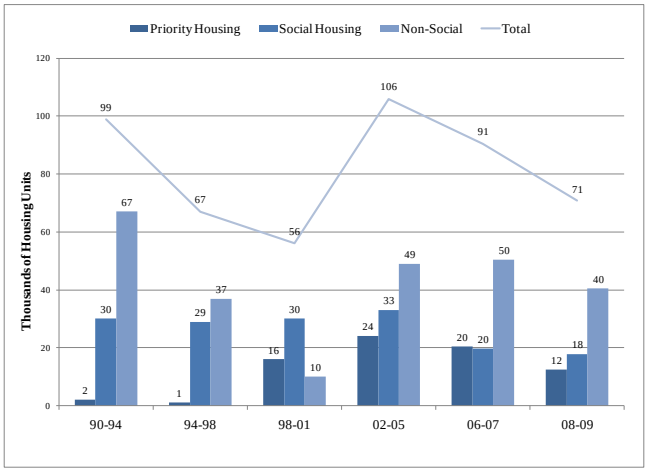
During the last ten years construction of priority housing has increased, but total social housing as a whole has decreased, especially in the recent economic downturn.

During the crisis of 1999 construction dropped to an annual average of 56 thousand units, 43.4% below the figure observed in the early nineties. This reduction was mainly due to the fall in non-social housing construction, which decreased from an average of 67 thousand units in

[5] The 2005 figure corresponds to the National Census published by DANE (National Department of Statistics in Colombia),

1990-1994 to 10 thousand in 1998-2001, while social housing construction remained relatively constant and priority housing construction even rose from an average of 2 thousand units to an average of 16 thousand units. Construction of all types of housing recovered during the period 2002-2005, reaching an average of 106 thousand units. During the recent economic downturn, new construction projects declined to 71 thousand units on average in 2008-2009, due to the fall in social and priority housing construction which lowered by half. In contrast to the crisis of the nineties, this time non-social housing only decreased by 17% (see Figure 1)

Figure 1 New Housing Units under Construction



Source: DANE (Construction Census, 2009) and Cuellar (2006)

3.3 Main Characteristics of the Social Housing Mortgage Market

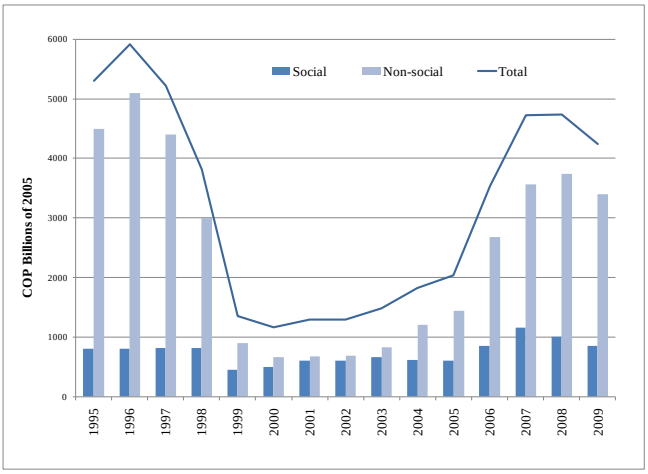
Housing finance in Colombia is small as compared to Latin American records. Mortgage loans ranged from 2.9% to 3.2% of GDP during the last five years, while the regional average is around 5%[6]. After the financial crisis of the late nineties, which lasted from 1998 to 2001, the Colombian mortgage market recovery has been weak even with respect to total credit: while the ratio of total loans of GDP increased from 22.2% in 2001 to 28.5% in 2009, mortgage credit decreased from 5.8% of GDP in 2001 to 3.2% of GDP in 2008.

Mortgage disbursements declined by 78.0% between 1996 and 2000, where non-social housing disbursements registered the largest reduction (85.3%), while social housing

[6] Warnock and Warnock (2008)

disbursements fell by 37.5% (Figure 1). This trend was slowly reversed after 2001 and mortgage disbursements grew steadily until 2008, but decreased in 2009 owing to the recent economic downturn. Total disbursements reached a maximum in 2008, although they were only equivalent to 80% of the figure registered back in 1996. The recovery has been especially weak for non-social housing disbursements, equivalent in 2008 only to 73% of the figure observed in 1996. Disbursements for social housing had a better performance, rising in 2008 above the level of 1996 by 24%. In line with the recent growth of social mortgage disbursements, the share of social housing credit portfolio grew from 32.1% in 2002 to 44.0% in 2009, while non-social housing credit has reduced from 67.9% in 2002 to 56.0% in 2009[7].

Figure 2 Mortgage Disbursements



Source: Financial Superintendence and Cuellar (2006)

4 Housing policy instruments and regulation in Colombia

4.1 Housing Policy Instruments

4.1.1 Subsidies

4.1.1.1 Main Characteristics

The Social Housing Subsidy was created in 1991 as the main instrument of a new demand-oriented social housing policy. Since its inception, the subsidy has had several modifications, but

[7] Data published by the Financial Superintendence of Colombia.

the general characteristics remain unchanged. It is a one-time direct subsidy intended to facilitate access to housing by the poorest households.

Since 1991, the subsidy has been managed and granted by four institutions: i) Fonvivienda, a government agency (which replaced the former Inurbe in 2003[8]), serving informal workers' families; ii) the Family Welfare Agencies[9] (FWA) serving formal workers' families; iii) the Military Housing Promotion Agency (MHPA); and iv) the Public Agricultural Bank (Banco Agrario) operating in rural areas.

Fonvivienda and the FWA manage the main share of resources available for the housing subsidy. These two entities assigned 72,0% of the subsidies from 1991 to 2009, while the MHPA and the Public Agricultural Bank assigned 15,7% and 12,2% of the subsidies, respectively, during the same period[10]. The subsidy is financed by the National Budget and by payroll taxes collected and managed by the FWA[11].

Beneficiaries are selected according to two conditions: i) earning less than 4 monthly minimum[12] legal wages as a family or ranking in the lowest living conditions levels (according to SISBEN[13] classification); ii) subsidies are assigned by a scoring methodology[14] that ranks applicant households according to their saving efforts (saving balances with respect to housing value or income and saving time) and socio-economic characteristics (household size, women

[8] In 2003, the Government carried out an institutional reform of the housing sector. The functions of housing policy design and coordination were delegated to a new branch of the Ministry of Environment, the Housing and Land Development Branch, creating the Ministry of Environment, Housing and Territorial Development (MAVDT, for its acronym in Spanish). INURBE was liquidated due to inefficiency and lack of transparency in its operations, and was replaced by the Housing National Fund (FONVIVIENDA). Some of the tasks formerly carried out by INURBE were delegated to third parties. Under the new system the Family Welfare Agencies are in charge of the application process for the subsidies, FINDETER (a public rediscount bank) evaluates and authorizes social housing construction projects and FONVIVIENDA assigns subsidies to families of informal workers.

[9] The Family Welfare Agencies (FWA) or *Cajas de Compensación Familiar* are private non-profit entities that provide a range of social services, including social housing.

[10] Data published by the Ministry of Environment, Housing, and Territorial Development.

[11] In Colombia private enterprises pay payroll taxes equivalent to 14% of wages, from which 4 percentage points are managed by FWA.

[12] 4 monthly minimum wages in 2010 were equivalent to COP $2,060,000 (USD $1,084).

[13] SISBEN is an indicator of households' economic well-being, which serves as an instrument to target social programs. The index is a function of a set of variables related to the consumption of durable goods, human capital endowment and current income. The Social Housing Subsidy is targeted to households ranked in the two lowest SISBEN levels. Family income level is also used to target the program.

[14] This methodology was introduced in 1991, when beneficiaries were chosen by their highest score in the following criteria: previous savings, availability of complementary resources, construction materials and labor availability and belonging to a popular housing organization. The scoring criteria have had some minor modifications over the years (see Table 1). In 1993, they were adjusted including: previous savings, Basic Unsatisfied Needs Index, housing solution type and value and population size in the municipality and individual or collective application to subsidy.

headed household, and handicapped or senior citizen in the household). Additionally, housing subject to the subsidy should have a maximum price of 135 minimum wages (70 minimum monthly wages for priority housing)[15] and the highest value of the subsidy is inversely related to the household´s monthly income or to the value of the house. The value of the subsidy granted by Fonvivienda was inversely related to the value of the house from 1993 to 2007[16]. To better focus the subsidies among households belonging to lower income ranges, the maximum value of the subsidy decreased from 1999 to 2007, especially for the purchase of housing worth more than 70 minimum wages. The real value of the subsidy decreased by 5.4% for priority housing and dropped by more than 35% for the purchase of higher value houses. From 2008 onwards[17] the maximum value of Fonvivienda's subsidy was set to vary according to the beneficiaries' income, assigning higher subsidies to families belonging to lower income ranges. Additionally, the subsidy was restricted to priority housing[18].

4.1.1.2 Fonvivienda's Budget Distribution

Subsidies managed by Fonvivienda are of special interest because they serve informal workers. The resources managed by Fonvivienda, which amount to more than a third[19] of the total resources for housing subsidies assigned in Colombia, are distributed among various independent competition schemes, which have increased from two initial competitions in 2000 to ten in 2010. These competition schemes are designed to support different types of housing solutions and benefit population segments living in particular conditions, but in general all of them follow a similar methodology to rank beneficiaries that considers the criteria described in section 4.1.1.1.

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[15] 135 and 70 monthly minimum wages in 2010 were equivalent to COP $69.5 million and $36.0 million, respectively (USD $36,592 and $18,974).

[16] From 1991 to 1993, the value of the subsidy was detached from the value of the house. Law 49 of 1990 established a maximum value of the subsidy of 15 minimum wages for housing obtained in collective processes (where housing units should cost less than 50 minimum wages) and 12 minimum wages for housing obtained individually. Decree 2154 of 1993 set the maximum value of the subsidy granted by INURBE as follows: 20 mw for housing valued under 70 mw, 15 mw for housing valued between 93 mw, and 12 mw for housing valued between 96 mw and 135 mw. For deed registration or land purchase the value of the subsidy was 13 mw, while for housing improvement it was 16 mw. This same Decree set the maximum value of the subsidy granted by Family Welfare Agencies as follows: 23 monthly wages for households earning less than 2 mw, 15 mw for households earning between 2 and 3 mw, and 12 mw for households earning between 3 and 4 mw.

[17] See Decree 4466 of 2007 and Law 1151 of 2007 (Art. 86).

[18] This doesn't apply to Family Welfare Agencies as they are ruled by private law.

[19] On average 38.1%.

The competition called *Regular* was the first scheme created to assign subsidies to purchase new housing units directly in the market, invest in housing improvement or self-construction. The second scheme put in place was the *Territorial Effort*, in response to the lack of housing supply in municipalities with population below 50 thousand inhabitants. This subsidy is allocated among housing projects carried out by local governments and is matched by infrastructure works and/or land provided by local governments and by the *Regular Subsidy* obtained individually by households[20]. The combined resources cover a large percentage of the cost of the housing solution, helping families[21] with little access to the credit market and no previous saving, to buy priority housing.

In 2004, three additional competition schemes were created. First, the competition for *Special Population*, aiming at assisting families displaced by violence and victims of natural disasters or terrorist acts[22], which has gained a significant importance over the last years. Under this scheme, in order to facilitate access to housing solutions for these families, previous savings are not required and the subsidy may be used to finance the purchase of existing housing, rent, self-construction or improvement. Currently, the maximum value of the subsidy is 25 minimum wages compared to 22 minimum wages for the rest of the population[23]. Second, the *National* competition, which promotes priority housing construction in municipalities over 50 thousand inhabitants as well as macro-projects, and is complemented by the *Regular Subsidy*. Third, the *Deed Registration* competition, which allows de facto tenants of social housing located in lands owned by the State to legalize their ownership if they meet certain conditions[24]. Under this scheme, the government provides the transfer of the land´s ownership and/or the partial financing of the registration costs.

Between 2006 and 2008 five more competitions were established: two of them to subsidize housing improvement and the other two to subsidize the purchase of housing by

[20] The projects with highest funding offered by the local government obtain higher scores in the competition. Under this scheme, each department has a budget quota and the competition is done among applicants of the same department (See the website https://sites.google.com/site/socialhousingcolombia/ to obtain the formula used to distribute resources among departments).

[21] This subsidy is targeted to families earning less than two minimum monthly wages who apply to buy priority housing (housing worth less than 70 minimum wages).

[22] The last two groups were included in 2006.

[23] 22 and 25 monthly minimum wages in 2010 were equivalent to COP $11.3 and COP $12.9 million, USD $5,963 and USD $6,776, respectively.

[24] See https://sites.google.com/site/socialhousingcolombia/ for detailed information.

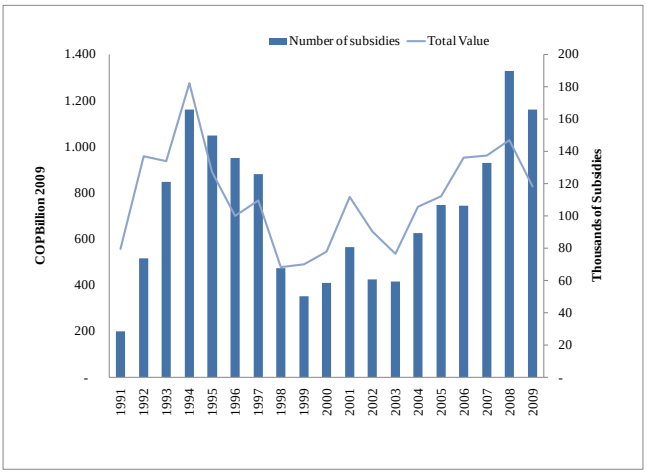
households with members working in recycling related activities and by city councilors living in municipalities under 50 thousand people.

The last scheme, called *Saving with Favorable Credit Evaluation* and created in 2009, is directed to households holding previous saving and a certification of favorable credit evaluation. The distribution of Fonvivienda's budget among these competitions has determined the targeting of the Social Housing Subsidy as will be shown in the following section.

4.1.1.3 Execution of Housing Subsidies

As shown in Figure 3, total assigned subsidies registered an annual value of $916 billion pesos[25] on average from 1991 to 1997. From 1998 to 2000 this average dropped by half, which is associated to the fact that during the economic crisis the public budget was reduced specially for investment and social spending. From 2001 to 2009, the assignment of subsidies recovered, rising to an average equivalent to 86.5% of the level observed during the early nineties. From the total assigned subsidies in Colombia since 1991, 37.4% were assigned by Fonvivienda and 34.1% by the Family Welfare Agencies[26].

Figure 3: Assigned Subsidies, 1991-2009



Source: Ministry of Environment, Housing and Regional Development (MAVDT)

[25] Approximately, USD $482 million.

[26] See https://sites.google.com/site/socialhousingcolombia/ for more information on the execution of the subsidy by Family Welfare Agencies

The number of households that benefited from housing subsidies registered its highest level from 1993 to 1997 (140.000 households on average) due to the larger number of subsidies assigned for housing improvement, which have a lower cost[27]. The coverage of the program reached its lowest values from 1998 to 2000. From 2001 to 2008, the number of beneficiaries started increasing again due to the continuous reduction in the value of the subsidy, the introduction of new competition schemes with lower average costs, such as the housing improvement and deed registration subsidy, and the over-assignment strategy adopted since 2002[28].

The average value of the subsidy surpassed COP $16.3 million pesos of 2009[29] in the period 1991-1992. From 1994 to 1998 the average value of the subsidy was relatively low (6.4 million pesos of 2009), due to the emphasis placed on housing improvement. Then, from 1999 to 2003 it increased to 9.6 million pesos of 2009 and declined to an average of 7.0 million pesos of 2009 during the period 2004-2009. Regarding subsidies assigned by Fonvivienda's competition schemes, those assigned to displaced population[30] has grown to more than 50% of the total assigned value since 2007, when the national development plan (2006-2010) established it as a priority. Since the total amount of resources available for the housing subsidy are fixed by law, the rise in the budget for displaced population has resulted in less resources for the rest of the population. In particular, subsidies assigned by the territorial effort competition diminished from 38.6% in 2003 to 10.2% in 2009 and the assignments by the regular subsidy dropped from 39.1% in 2003 to 0.3% in 2009.

From 2003 to 2009 most of the assigned subsidies were used for housing purchase (82.5%). The share of subsidies assigned for self-construction recorded an average of 7.5%, while the use of subsidies for housing improvement grew from 0.2% in 2003 to 8.6% in 2009, mainly due to the creation of two competition schemes specialized in improvement. The share of subsidies assigned for renting varied over the period and had an average of 6.2% (Table 1).

4.1.2 National Guarantees Fund (NGF)

[27] Cuellar (2006) and Chiappe (1999) explain how from 1994 to 1997 the housing subsidy focused on improvement projects. According to Chiappe (1999) 38.5% of total housing subsidies were assigned to improvement projects.

[28] This strategy was implemented to ensure a larger ratio of disbursement to assignment.

[29] Equivalent to USD $7,560.

[30] In 2009 the total number of displaced population was 3.3 million (7.0% of the country´s population).

Partial mortgage guarantees established in 2004, are provided by the National Guarantee Fund[31] (NGF) to the financial intermediaries holding mortgage portfolio, which are previously evaluated according to a risk assessment. A "maximum portfolio value to be guaranteed" (MPV) is assigned to each financial intermediary and, independently, they evaluate and approve guaranteed loans to each final borrower up to the MPV. The guarantee becomes active when arrear portfolio surpasses 18 months or when the financed housing unit is given as loan payment.

The NGF relies on the risk assessment made by intermediaries to final borrowers. This reduces operating costs, and optimizes the information advantage that intermediaries have over the NGF. Intermediaries' delinquency rates are constantly monitored. If an intermediary shows an excessive increase on its delinquency rates, its MPV is reduced in order to mitigate moral hazard.

The NGF guarantees the non-payment risk of loans for social housing. Loans subject to guarantee should not exceed 108 minimum wages[32] or 80% of the housing unit value and should finance housing purchase, improvement or self-construction. The guarantee covers up to 70% of the expected loss[33] for individual loans with financial intermediaries or up to 50% of the outstanding debt for rediscount portfolio. The guarantee covers a period of 7 years or less and its monthly cost is 0.0943% plus VAT of the outstanding debt ($1,045 pesos for each $1 million pesos borrowed) (See Table 1 for a detailed description of the mortgage guarantees offered by the Fund).

4.1.3 Programmed Savings

Programmed saving accounts complement the subsidy and facilitate access to credit, by signaling payment habits and the ability to pay. Previous savings were a prerequisite to apply to the

[31] The National Guarantee Fund (*Fondo Nacional de Garantías*), supervised by the Financial Superintendency, was created in 1982 as a mixed-economy entity to provide partial credit guarantees. Its stakeholders are the Ministry of Finance (60%), the Ministry of Trade, Industry and Tourism (20%), Bancoldex (12%), Findeter (7.2%) and the SMEs Union (ACOPI) (0.8%).

[32] 108 monthly minimum wages in 2010 were equivalent to COP $55.6 million (USD $29,274).

[33] This expected cost includes outstanding debt, non-paid insurance fees, non-paid interests and collateral recovery expenses minus the value of the housing unit received as payment.

housing subsidy[34] from 1991 to 1993. Considering that this prerequisite was difficult to meet by most of the applicants, since 1994 previous savings were eliminated as a prerequisite and were left only as one of the scoring criteria to select applicants[35].

Law 812 of 2003 and Decree 975 of 2004 introduced again previous saving as a prerequisite to apply to the subsidy, but with no requirements on saving history and with a broader definition that includes statutory guarantee payments (severances or *cesantías*), investments on land, progress in self-construction and savings in financial accounts that don't require regular deposits (*aportes periódicos de ahorro*). These alternatives do not necessarily signal the borrower's capacity to make regular payments to the financial system. Programmed saving accounts for social housing grew from January 2000 to April 2003, and stagnated from 2003 to 2008, which may be associated to the saving prerequisite relaxation already described.

The last competition scheme introduced by Fonvivienda in 2009, *Saving with Favorable Credit Evaluation*, seeks to increase access to encourage the use of programmed saving programs and increase access to credit (see section 4.1.1.3.). The coverage of this scheme is still low (4.7% of the total assigned subsidies). However, the outstanding balance of the programmed saving accounts started increasing in 2009, which may be associated with the introduction of this new scheme. Subsidies in this scheme were assigned mainly to families earning between 2 and 3 monthly minimum wages (73.2%) and 18.1% to families earning between 3 and 4 minimum wages. The remaining 8.7% was assigned to families earning less than 1 monthly minimum wage.

5 Housing subsidies, housing finance and quality of life

5.1 Estimation of the impact of subsidies and credit on quality of life

5.1.1 Housing loan borrowers and housing subsidy beneficiaries characterization

[34] Decree 599 of 1991.

[35] Decree 2154 of 1993. According to Law 633 of 2000 (Art. 69), families earning less than 2 monthly wages apply to the subsidy with no previous saving, as long as they have enough resources to match the subsidy. Decree 975 of 2004 also eliminated the previous saving prerequisite for especial population, i.e. violently displaced population, victims of natural disasters or terrorism.

Access to housing credit and housing subsidies is limited in Colombia. According to the last National Census (2005), only 6% of the homeowners had a mortgage. The Quality of Life surveys (QLS) of 2003 and 2008 showed similar figures (5.19% and 5.24%, respectively).

According to the QLS of 2003, between 1997 and 2002 only 13.54% of the total 759.658 home-buyers funded their purchase with a mortgage, a percentage that increased using the data of the QLS of 2008. Between 2002 and 2007, there were 1 million home-buyers and 22,11% of them funded their purchase with mortgages (Table 1). The QLS surveys show that the main sources of funds to buy a house are savings, mortgages and informal credit from friends or relatives. Low-income households mostly use informal credit and savings, while high-income households rely mainly on mortgages and severance payments.

Access to housing subsidies is even more limited than access to mortgages. According to the QLS survey of 2003, between 1997 and 2002 only 8.21% of the homebuyers obtained a subsidy. The QLS Survey of 2008 does not provide the percentage of homebuyers that had a subsidy, but shows that only 1.19% of the households had a housing subsidy between 2007 and 2008 (Table 1)[36].

Most of the households with access to credit share the following characteristics: live in urban[37] areas, belong to the highest income quintile and are headed by a male, who has more than 12 years of schooling, works in the informal sector and aged between 35 to 49 years. Most of the households benefited from housing subsidies also live in urban areas, and are headed by a male who works in the informal sector and aged between 35 to 49 years. However, in contrast to those with access to credit, the beneficiaries of the subsidy belong to the lowest income quintiles and their household head have lower education levels (less than 5 years of schooling).

5.1.2 Incidence and Targeting

5.1.2.1 Housing and poverty

[36] In 2003, the Quality of Life Survey asked for the funding sources of houses purchased between 1997 and 2002, including the housing subsidy as a possible source. In 2008, the Quality of Life Survey only asked whether a household had obtained a housing subsidy in the last 12 months, but the question is not related to the purchase of a house. The subsidy could have been already used or just assigned.

[37] Urban: Main Area of a Municipality=1, Rest=0

To analyze access by the poorest families to housing subsidies and mortgages we measured poverty using the Unsatisfied Basic Needs index (UBN)[38]. In 2008, 24.1% of Colombian households were poor (24.2% in 2003). The percentage of poor families benefited by the housing subsidy was 23.0% in 2003 and in 30.6% in 2008. The percentage of mortgage borrowers classified as poor was even lower, only 15.8% in 2003 and 11.8% in 2008.

Most of the poor families benefited by housing subsidies and/or mortgages were headed by males, who worked in the informal sector, salaried, married or cohabiting, with low education levels and lived in urban areas. Most of the borrowers classified as poor belonged to the 3rd and 2nd income quintiles, while most of the subsidy beneficiaries classified as poor belonged to the 2nd and 1st quintiles.

The distribution of the housing subsidy outlays by income level had a slight improvement from 2003 to 2008. Families from the lowest four income deciles received 52% of the total subsidy outlays in 2003, while this percentage rose to 60% in 2008. Additionally, in 2008 some households belonging to the 7th to 9th income deciles had partially lost their participation as beneficiaries of the housing subsidy in comparison to 2003. However, it is not clear why non-targeted households (i.e. households living on more than 4 minimum wages or monthly income above the 7th decile) were receiving the subsidy.

5.1.2.2 Quality of housing solutions

This section analyses whether credit and subsidies have improved the quality of housing among the beneficiaries. The effect of housing credit and subsidies on quality of housing is measured by Propensity Score Matching techniques, using as outcome variable an indicator of the quality of housing and two binary treatments: access to housing credit and access to housing subsidy.

The Quality of Dwelling (QoD) index is measured by a Principal Components Analysis (PCA), which includes indicators such as access to potable water, sewerage, electricity, and

[38] The Index of Unsatisfied Basic Needs (UBN) is a measure of structural poverty based on the minimum level of physical and human capital necessary for the satisfaction of basic needs. The dimensions and criteria for identifying a household as having an Unsatisfied Basic Need are summarized as follows: 1) inadequate housing, 2) no access to utilities, 3) crowding, 4) scholar attendance, and 5) economic dependency. A person or a household is classified as poor if it hase one of the previous listed basic needs unsatisfied.

rubbish collection services, as well as the construction materials of walls and floors and the availability of an independent room for cooking.

The Propensity Score Matching (PSM) attempts to calculate the impact of the treatment variables by creating a comparison group that would have been affected by treatment variables in a similar fashion to the treated group. The change in the outcome attributable to the subsidy or credit is therefore calculated as the difference in average values of the treated and comparison groups.

The first step to perform PSM is to estimate Logit models in which the dependent variables are treatment dummies (housing subsidy and housing credit). The models are then used to estimate the propensity score of being treated, given a vector of individual characteristics. All the models control for demographic and economic characteristics at household-level[39]. The models also include interaction terms between each variable and region dummies to increase the goodness of fit, but this set of coefficients are not reported. Another criterion used to determine the final correlates for the logit models was the Balancing Hypothesis (or CIA), which states that there should not be statistical difference between treated and non-treated individuals, with similar propensity scores, on the mean of all the correlates used in the model[40].

The second step is the matching based on the propensity score. One approach to match participants and nonparticipants is the Local Linear Matching (LLM), a nonparametric estimator that uses a weighted average of all nonparticipants to construct the counterfactual match for each participant. LLM estimates a nonparametric locally weighted regression of the comparison group outcome, in the neighborhood of each treatment observation (Heckman, Ichimura, and Todd, 1997). Under this approach we will match credit borrowers (subsidy beneficiaries) with other households that share similar characteristics but do not have housing loans (subsidies). Once the matching is made we will be able to compute the effect of housing credit (subsidies) on the quality of dwelling index.

To construct the QoD index using the PCA, we take the first principal component since it summarizes the higher proportion of the total variance of the set of variables used in the analysis.

[39] The control variables include: household head´s age, gender, education level, marital status and work status, as well as household's size, income and residence location (urban or rural).

[40] If the Balancing Hypothesis is assured, then treated and control observations used in the matching process are very close to one another, at least in the set of observable characteristics used to predict the propensity score.

In our case, the first component summarizes 29.7% and 22.2% of the total variance for the 2003 and 2008 quality of life surveys, respectively.[41] The features of high-quality buildings are access to utilities, using bricks and prefabricated materials for the walls, floors made of marble, parquet, vinyl, or tiles and having proper places for cooking. **¡Error! No se encuentra el origen de la referencia.** shows the results of the Quality of Dwelling index (QoD), the outcome variable for the PSM.

We estimate the Average Treatment Effect on the Treated (ATET) for 2003 and 2008. Results show a positive and significant ATET in 2003 (**¡Error! No se encuentra el origen de la referencia.**), which means that housing loans and housing subsidies account for a positive and statistically significant difference in the quality of dwellings[42] between the matched treated (households that had a credit correspond to the 1st treatment, and households that had housing subsidy to the 2nd treatment) and control groups. In 2008 we do not observe any effect of housing subsidies on quality of dwelling, although a significant and positive effect on quality of dwelling is observed for households that acquired a house between 2002 and 2007 and used housing loans as a source of funding.

5.1.3 Quality of Life

This section analyses whether credit and subsidies have improved life conditions among the beneficiary population. The effect of housing credit and subsidies on quality of life is quantified by Propensity Score Matching techniques, using as outcome variable a household-level measure of quality of life, and two binary treatments: housing credit and housing subsidy access. First we explain some characteristics of the methodology used to construct the quality of life index and analyze the quality of life among the beneficiaries of subsidies and mortgages. Then, we explain the methodology and results of the estimation of the effect of housing credit and subsidies on the quality of life.

[41] In our case, all variables are discrete. Therefore, the PCA is applied on the basis of a tetrachoric correlation matrix that explicitly takes account of the discrete nature of our variables. Hamill (2009) provides evidence on the importance of applying PCA to discrete data by calculating an appropriate correlation matrix to reduce biases in the covariance structure and avoid underestimations of the proportions of the explained variance.

[42] These are dwellings in the social housing group, according to the household income criterion of the social housing program in Colombia

The Quality of Life index (QoL) is measured through a Principal Components Analysis (PCA). This analysis includes indicators such as education level, children attending school, access to health services, economic dependency, crowding, housing conditions, assets and subjective assessment of life conditions. To construct the QoL index we use the first principal component, which summarizes 30.5% and 21.4% of the total variance for the 2003 and 2008 QLS, respectively.[43]

¡Error! No se encuentra el origen de la referencia. shows the coefficients of each variable for the first principal component. The sign of each coefficient shows the relation that each variable holds with the QoL index. All signs are consistent with the economic intuition. For example, if the household head has high education and access to health services, then the quality of life is positively affected. The index increases with better housing conditions such access to utilities, appropriate places for cooking, better wall and floor materials, and investments in durable goods. Subjective opinions about poverty and life conditions also have an impact on the quality of life. When households consider that they have better life conditions, the quality of life is considerably higher.

To determine whether a household is poor, according to the QoL index, we established a threshold based on prior information of the percentage of poor households, according to the UBN definition of poverty (24.0%). Households whose QoL index is below 1.69 and 1.71 (the 24^{th} percentiles) in 2003 and 2008, respectively, are classified as poor.

The beneficiaries of housing credit and mortgages differ on their quality of life conditions. The second panel of Figure 4 shows the distribution of the QoL index for mortgage borrowers in 2003, which is concentrated in the higher values of the distribution. In contrast, the distribution of this index for the beneficiaries of the subsidy is less concentrated in the higher values of the distribution.

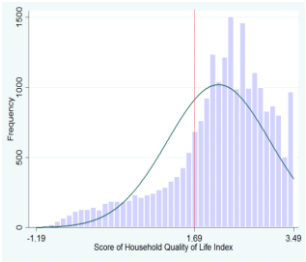
Considering the QoL poverty threshold, we observe that few credits are lent to poor households whereas housing subsidies are likely to be equally assigned to poor and non-poor households. The results do not change dramatically in 2008 despite the fact that during this year a larger segment of poor population was benefited by housing subsidies (third panel of Figure 5).

[43] In our case, all variables are discrete. In this case, the PCA is applied on the basis of a tetra choric correlation matrix that explicitly takes account of the discrete nature of our variables. Hamill (2009) provides evidence on the importance of applying PCA to discrete data by calculating an appropriate correlation matrix to reduce biases in the covariance structure and avoid underestimations of the proportions of the explained variance.

To answer whether credit and subsidies are improving the life conditions of their beneficiaries we use the Propensity Score Matching (PSM). Housing credit and housing subsidy could be considered as a treatment, where the outcome is the quality of life. If we want to estimate the outcome effect of such treatments, our major concern should be the selection bias created by the rule of selection into treatment. Given our data, we consider that the best empirical strategy is to estimate the Average Treatment effect on the Treated (ATT) using PSM.

Figure 4 Distribution of the Quality of Life Index, 2003

(a) All households



(b) Housing Credit Borrowers

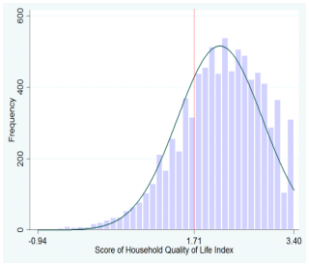
(c) Housing Subsidy Beneficiaries

Source: Authors' calculations based on 2003 Quality of Life Surveys (DANE)

The estimation of the propensity score for treated and non-treated households, based on logit models, follows the same methodology as the one used in section 5.1.2.2. Focusing on the local linear regression matching estimations we find a positive and significant effect on quality of life as shown in **¡Error! No se encuentra el origen de la referencia.**, with the exception of housing subsidy in 2008.

Figure 5 Distribution of the Quality of Life Index, 2008

(a) All households



(b) Housing Credit Borrowers

(c) Housing Subsidy Beneficiaries

Source: Authors' calculations based on 2008 Quality of Life Surveys (DANE)

5.2 Determinants of access to housing subsidies and housing loans

Subsidies could facilitate access to a mortgage by low-income households. However, given the design of the housing subsidies program in Colombia, it is mandatory to show the outstanding money required to acquire a dwelling before receiving the cash transfer[44]. Since credit is a source of complementary resources we identify a source of reverse causality between housing subsidies and housing loans which leads to biased estimators if this is not controlled for.

5.2.1 The two-equation simultaneous system for social housing credit access and housing subsidy access

While a dual relationship may exist between housing credit and housing subsidy, it is likely that access to housing subsidy plays a more important role in explaining access to housing credit than

[44] This is the case for every housing subsidy granted by the Family Welfare Agencies and for five out of the ten types of subsidies managed by Fonvivienda (the Regular Subsidy and the Saving with Favorable Credit Evaluation Subsidy, as well as subsidies for Deed Registration, Recyclers, and City Councillors require complementary funding). In particular the Regular subsidy accounted for 39.1% of the assigned subsidies in 2003 (See Section 4.1.1.3).

vice versa, as households are able to prove additional sources of funding other than credit. We specify the following equations for credit access and subsidy:

$$Credit_i^* = \beta_0 + \beta_1 X_i + \beta_2 Subsidy_i^* + u_i^* \quad (1)$$

$$Subsidy_i^* = \theta_0 + \theta_1 X_i + \theta_2 Z_i + \theta_3 Credit_i^* + \varepsilon_i \quad (2)$$

Where, $Credit_i$ * and $Subsidy_i$ * are the continuous, latent random variables that represent, respectively, the access to housing credit and to housing subsidy of households. Within this framework, $Credit_i$ * and $Subsidy_i$ * are non-observable variables. However, the discrete dependent variables $Credit_i$ and $Subsidy_i$ are observable, such that:

$$Credit_i = 1(Credit_i^* > 0) = 1(\beta_0 + \beta_1 X_i + \beta_2 Subsidy_i + u_i > 0) \quad (3)$$

$$Subsidy_i = 1(Subsidy_i^* > 0) = 1(\theta_0 + \theta_1 X_i + \theta_2 Z_i + \theta_3 Credit_i + \varepsilon_i > 0) \quad (4)$$

$Credit_i$ =1 if household has a housing loan, and 0 otherwise; $Subsidy_i$ =1 if household has a housing subsidy, and 0 otherwise. X_i, is a vector of exogenous household socioeconomic characteristics such as household's head gender, marital status, age, education level, and working conditions (formal/informal), as well as the number of household members and, an assets index[45] used as a proxy of wealth. Finally, to ensure that each coefficient in the system of equations is identified, certain variables are included in the housing subsidy equation and excluded from the credit equation and vice versa. In our model, Zi are two variables: a) a dummy variable of having programmed saving accounts or not, and b) an indicator of housing crowding, which are variables excluded from the credit equation.

The model is estimated using a sample of 750 households that acquired a new house between 1998 and 2002 and belong to the first seven deciles of the income distribution (i.e., social housing). Each of the two-stage models consists of an equation for the probability of accessing to a housing credit and another equation for the probability of accessing to a housing subsidy. Recall that the first stage equations, which include all of the exogenous variables, are estimated for housing credit and housing subsidy. In the second stage, whether the household has credit card is excluded from the housing subsidy equation. Similarly, variables that control for

[45] This index is calculated with PCA using variables of durable goods such as television, refrigerator, washing machine, automobile and computer.

inadequate housing and inadequate access to utilities are excluded from the housing credit equation.

Throughout this section, marginal effects are calculated as follows. The first-stage estimation creates predicted values for access to credit (Predicted Value: Housing Credit) and access to subsidy (Predicted Value: Housing Subsidy) that are continuous variables ranging from positive to negative values. An individual has access to credit if the predicted value is positive. Then, the weighted means of the predicted values are used to calculate the marginal effects.

The results in the first column of **¡Error! No se encuentra el origen de la referencia.** show that, after controlling for household and regional characteristics, a housing subsidy significantly increases the likelihood that a household has access to housing credit when the reverse causality is not accounted for. The second column of **¡Error! No se encuentra el origen de la referencia.** presents the results from the second-stage probit model for the social housing credit equation. The results show that access to subsidy does not increase the likelihood for a household to have access to credit as it was first estimated. Thus, not controlling for this source of endogeneity provides misleading results.

In **¡Error! No se encuentra el origen de la referencia.** we also observe the first and second stage estimation results of the housing subsidy equation. In particular, we obtain that programmed saving accounts is a significant explanatory variable that increases the probability of accessing to subsidies once the endogeneity with housing credit has been controlled for (see column 4).

We do not find a significant effect of the probability of having a credit on the probability of having access to subsidy, despite the design of the program, which in many cases requires having complementary funding. However, this is plausible given that most of the households use their own savings or informal sources of credit to buy their housing.

5.2.2 The two-equation simultaneous system for social housing credit access and housing subsidy access using a private bank dataset

The effect of accessing to subsidy on accessing to housing social credit is also estimated using data from a Colombian private mortgage bank (one of the most important in the mortgage market). The dataset has 33,689 observations of housing loans, out of which 71.09% are social

housing loans. About 54% of mortgage borrowers are households belonging to the 1st and 2nd income quintiles. 11.27% of the social loans are subsidized and around 78% of borrowers who had a subsidy belong to the 1st and 2nd income quintiles.

The effect of accessing to subsidy on accessing to social housing credit is estimated using the two-stage Maddala estimation procedure. Results displayed in the first two columns of **¡Error! No se encuentra el origen de la referencia.** show a positive and significant effect of housing subsidy on housing credit, as well as variables such as the type of job contract (temporary workers are more likely to have access to credit than retired people) and using the loan to acquire a new house instead of a second-hand one. The higher probability of having a housing subsidy is positively affecting the probability of accessing to housing loans in this bank. In particular, for low values of housing solutions, the subsidy might represent a considerable amount of such housing values which in turn reduces the amount of money lent to low-income people.

The credit score is the variable excluded from the subsidy equation. A higher credit score is related to a lower probability of default, it is observable by the bank and is taken into consideration when approving loan. The credit score has no relation with the assignment of subsidies. Additionally, we should account for some economic characteristics of social housing borrowers. These individuals usually have low levels of access to financial services and do not have credit experience. However, despite not having the best credit scores, they are likely to gain access to credit because of the availability of instruments such as the loan guarantee provided by the National Fund of Guarantees.

The probit model results in **¡Error! No se encuentra el origen de la referencia.** also show that after controlling for the reverse causality with housing credit, the probability of having a credit is not affecting the probability of having access to subsidy. However, as we expected, people belonging to the lowest income strata are gaining access to the subsidy.

6 Housing loan guarantees policy

The Colombian government aims to help low-income households obtaining affordable housing through a guaranteed mortgage loan program available through financial intermediaries. As we

mentioned in Section 4.1.2, the National Guarantee Fund[46] (NGF) guarantees the non-payment risk of social housing loans. The guarantee covers up to 70% of the expected loss. These guarantees are provided to the financial intermediaries holding mortgage portfolio, but the final beneficiaries are the borrowers.

6.1 Analysis of guarantees program execution

The guaranteed loans administered by the National Guarantee Fund (NGF) have different characteristics depending on the intermediary participating in the program. The most important intermediaries are banks which disbursed more than 80% of the total guaranteed loans between 2006 and 2009. The Family Welfare Agencies and the National Saving Fund participate with 13% and 2%, respectively. The average Loan-To-Value (LTV, a ratio of the amount of a first mortgage to the total appraised value of real property) also differs across intermediaries: The National Saving Fund lent, on average, at higher LTV ratios than Banks and Family Welfare Agencies and, therefore, assumes a higher risk of default (Figure 6, left panel).

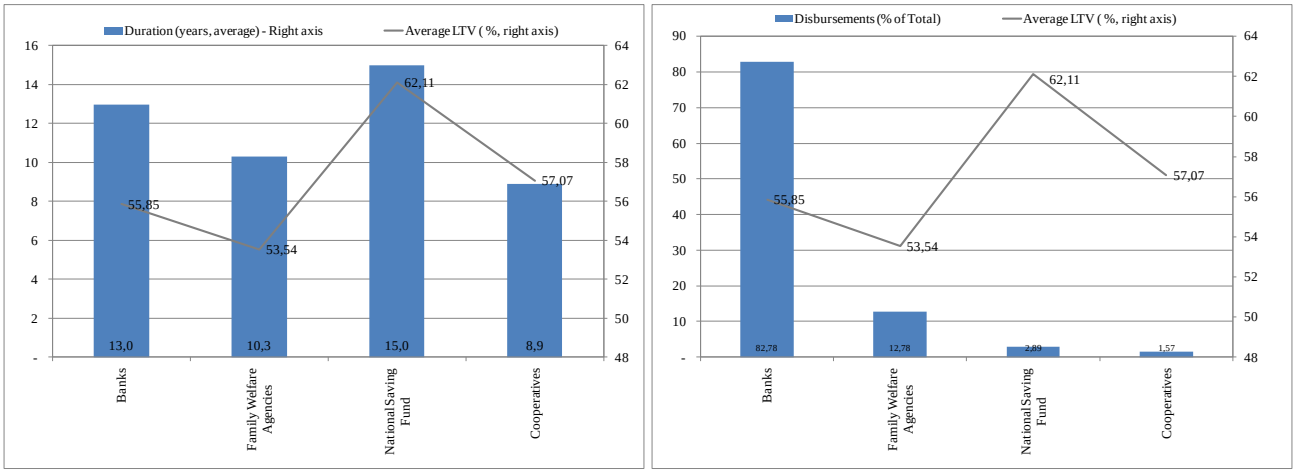
The National Saving Fund is also providing the longest term guaranteed loans (average duration of 15 years) followed by banks (average duration of 13 years), Family Welfare Agencies (10 years) and cooperatives (9 years) (Figure 6, right panel).

[46] The National Guarantee Fund (*Fondo Nacional de Garantías*), supervised by the Financial Superintendence, was created in 1982 as a mixed-economy entity to provide partial credit guarantees. Its stakeholders are the Ministry of Finance (60%), the Ministry of Trade, Industry and Tourism (20%), Bancoldex (12%), Findeter (7.2%) and the SMEs Union (ACOPI) (0.8%).

Figure 6

Average LTV **Duration of guaranteed loans**

By type of intermediary (% of Total)



Source: Author's calculations based on private lender dataset

However, the NGF does not select their program beneficiaries as this is a task performed by the institutions that provide housing loans. The NGF also does not have access to the profile of each of the beneficiaries of the guarantees. Despite this, we obtained data from the most important private lender participating in the program (we named this one "Intermediary 5"), so we are able to characterize the socio-economic profile of the guarantee beneficiaries. We have information on 33,689 mortgages of which 71% are social housing loans, 8.6% are subsidized and 17% are guaranteed by the NFG. Of the total of social housing loans, 24% are guaranteed by the NGF.

The typical NGF beneficiary of Intermediary 5 is a male, between 35 and 49 years, single, permanent worker, with secondary education and belongs to the 1st and 2nd income quintiles. This profile is consistent with the profile of individuals who are less likely to have proper collateral to support their loan applications. Given that housing subsidies and loan guarantees are not mutually exclusive programs, around 13% of NGF beneficiaries also have a housing subsidy.

Going further on the Intermediary 5's dataset we also estimate a probit model to identify those features that make an applicant more likely to have a NGF loan guarantee. Results in Table

2 show that a high credit score[47] (i.e. a lower probability of default) reduce the probability of having a guaranteed loan with this bank. This makes sense if such borrowers with poor credit history can´t provide any asset as collateral, other than their house. Individuals with no education have a higher probability of obtaining a guaranteed loan, as compared to individuals with high education level. Regarding marital status, single borrowers have a higher probability of having a guaranteed loan than other borrowers. Loans for acquisition of new housing and for families with a higher number of dependents face a higher probability of having a guaranteed loan. Finally, the probability of having a guaranteed loan is lower as the household's income increases.

The scope of the NGF program is low in terms of regional and portfolio coverage. The NGF program is still concentrated in some regions of Colombia. Bogota, Valle and Antioquia account for more than 75% of the total guaranteed loans. Additionally, the percentage of social housing loans backed by the NGF was only 18% from 2006 to 2008.

The regional coverage of the program reflects the limited financial access in non-urban areas in the country. Additionally, the program lacks a higher participation of non-banking intermediaries like cooperatives, which have a larger presence in rural areas and low income segments. This result might be also the consequence of different strategies followed by each region to promote the program. Finally, despite the apparent benefit of the guarantees, some financial intermediaries do not make use of them. This may be related to the operational procedures required to participate in the program and to specific policies followed by each intermediary in their selection of borrowers.

6.2 Credit performance of guaranteed loans

From 2006 to 2009, four financial institutions concentrated 69.3% of the total guaranteed loans, which were among the biggest mortgage banks in Colombia. The loan performance differed between institutions. The second most important lender of guaranteed social housing loans (by the size of its guaranteed loans disbursements) had 48% of the system´s guaranteed social housing portfolio in default. One plausible explanation behind this relies on the selection criteria of the beneficiaries used by this lender. It is possible that this lender only offered guaranteed

[47] The credit score is a score calculated by the private bank according to some of the socio-economic characteristics of housing loan applicants. However, we do not have access to information used in the calculation of this variable.

loans to bad payers. However, data availability refrain us from doing a proper assessment of such statement. As mentioned in the previous section, the NGF program is concentrated in the capital and two departments in the country. Therefore, these regions account for almost 80% of the total defaulted loans.

We also used Intermediary 5's database to analyze the explanatory factors of the default probability in housing loans. We run two regressions: one for every type of housing loans and only for social housing loans. In the first case the odds of default increase when the housing loan is a social housing loan, when borrowers have lower levels of education and when households have a larger number of dependents. However, when the loan is used to acquire a new house a lower probability of default is estimated. It is possible that buyers of new housing are more averse to lose their houses, make bigger efforts to preserve these assets and are more committed to repay their loans (see column 1 of Table 2). When we run the regression only for the sample of social housing loans we found similar results. Borrowers with characteristics such as having secondary education (as compared to high education), having more dependent household members and higher income are more likely to default (see column 2 of Table 2).

We also estimated the probability of default when the loan is guaranteed by the NGF. In the second column of Table 2 we observe that guaranteed loans are more likely to default than those which are not guaranteed. This is an interesting result as it suggests the loan guarantees schemes are not devoid of *moral hazard* y *adverse selection* problems. We also observe that using the mortgages to buy new housing reduces the odds of default, as compared to using it to buy used housing.

6.3 Estimation of the impact of loan guarantees on access to housing credit

We have some limitations to assess the impact of the NGF program on access to housing credit as we do not have data to build an appropriate control group and to identify factors that determine the selection of beneficiaries by the financial intermediary. However, we are still able to evaluate the effect of having loan guarantees on the number of new housing credits.

The database provided by the NGF provides the number of guarantees by municipality from 2006 to 2008. We also have the number of new housing credits by municipality and by financial intermediary, annually, from statistics provided by the Association of Banking and

Financial Institutions of Colombia (Asobancaria). Our sample has 62 municipalities across 14 regions in Colombia. For each municipality we use annual data of regional GDP and for each region we use the regional unemployment rate. Another control variable used in our study is the proportion of regional savings accounts for each year of the period 2006-2008. This variable is used to approximate the level of access to financial services in each region.

Given our data restrictions, we follow Cardenas and Rozo (2007) who suggest evaluating the program taking into consideration its operation at different points in time. The NGF program was applied in each municipality at different points during the period of study, so we are able to estimate the effect of the program as the coefficient of a dummy variable with value of one, from the year when the program started operations in each municipality and on. The municipalities of our sample are also comparable in terms of size (regional GDP), labor market variables (regional employment and unemployment rates) and financial variables (size of regional mortgages and regional access to financial services as a proportion of savings accounts)[48].

The effect of housing loan guarantees is estimated with a panel approach at municipality-level for the period 2006-2008:

$$\log(Y_{it}) = \beta_0 + c_i + T_t + P_r + M_m + \beta_1 NFG_{it} + \beta_2 W_{it} + \varepsilon_{it} \qquad (5)$$

Where, i denotes city and t year, Y_{it} is the number of disbursed loans by city per year; T_t is the year fixed effect; P_r is the regional fixed effect; M_m is the municipal fixed effect; NFG_{it} is a dummy variable =1 from the year the NGF started operations in certain municipality and 0 otherwise; and W_{it} are control variables (Regional per capita GDP, Regional unemployment rate and levels of access to financial services of the region).

The estimation results are displayed in Table 2. We do not find a significant effect of the NGF program on the number of housing loans. One plausible explanation is the limited scope of the program, which was described in Section 6.1.

7 Conclusions

[48] Therefore, cities such as Bogota, Medellin and Cali were excluded from our sample.

This paper studied the characteristics and evolution of social housing in Colombia. The housing deficit in Colombia is still high, both in qualitative and quantitative terms, and mainly affects low-income people. Access to credit, which could help improve housing conditions, is especially low among the poorest households. Only 15.8% of the borrowers in 2003 were poor, a figure that decreased to 11.8% in 2008. Public policies, such as subsidies and the NGF program, have played an important role in improving housing conditions for the poorest, but have been insufficient to satisfy their needs. According to 2003 and 2008 Quality of Life Surveys, only 4% of households owning their houses had a mortgage and around 8% had access to subsidies.

Subsidies are concentrated among low-income households, while most of the credit reaches only higher income households. According to the UBN index, 23.0% of the households that benefited from subsidies were classified as poor in 2003, and this percentage increased to 30.6% in 2008. However, there is room for improvement in the targeting of the subsidy. Households from the first decile (poorest people) have a lower participation in the subsidy than households from the third decile. This may be related to the fact that the poorest families face strong difficulties in accessing complementary funding, and the scope of the subsidy programs that do not requires this type of funding is limited. Additionally our data suggest a problem of design and execution in the subsidy, because some of its beneficiaries belong to high income deciles (7th and 9th deciles).

The propensity score matching estimators show that, in 2003, housing credit and subsidies had a positive impact on the quality of housing solutions and the quality of life. Results were not significant in 2008, because the available data was not suitable to design a proper control group.

According to the estimation of the simultaneous model, using the 2003 Quality of Life Survey, the possession of assets that serve as collateral strongly increase the probability of having access to housing credit. This probability is also positively affected by having a programmed savings account. The estimation of this simultaneous model using the private bank dataset showed that access to social housing credit is negatively affected by the borrower's income level and positively affected by the household's size and by having a housing subsidy. The probability of having access to housing subsidies is not affected by having access to housing credits, even though the opposite is significant and positive.

Regarding loan guarantees from the NGF, we found that the program is focused on backing low-income housing credits, easing access to loans. However, credits backed with guarantees from the NGF are more prone to be in default, suggesting the emergence of moral hazard and adverse selection problems. Additionally, we didn´t find evidence of the effect of the NGF program on access to credit, which may be related to the fact that the coverage of the program is very limited.

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Appendix Tables

Table 1

Table 1 Access to Public Utilities and Physical Characteristics of Housing Units
Households in the First Two Income Quintiles

	Q1	Q2
Sewerage		
No access	61,8%	43,7%
Access	38,2%	56,3%
Rubbish Collection		
No access	21,0%	14,1%
Access	79,0%	85,9%
Wall Materials		
Bricks	66,5%	81,3%
Wood	9,3%	6,6%
Disposable materials and Adobe	6,2%	3,4%
Other	18,0%	8,7%
Water		
No access	40,4%	28,8%
Access	59,6%	71,2%
Electricity		
No access	20,1%	13,6%
Access	79,9%	86,4%
Floor Materials		
Cement	52,9%	49,3%
Vinyl, tiles, bricks	22,2%	37,1%
Dirt	19,7%	8,6%
Other	5,2%	5,0%

Source: 2008 Quality of Life Survey (DANE)

Table 2 Beneficiaries Ranking Criteria for Social Housing Subsidy, 1990-2010

	Decree 2154/93	Decree 824/99	Decree 2488/02	Decree 4466/07
Socio-economic conditions				
SISBEN Level or Score[1]		+	+	+
Basic Unsatisfied Index	+			
Household size		+	+	+
Women headed household		+		
Women headed household, handicapped or senior citizen in the household			+	
Single-parent headed household, handicapped or senior citizens in the household				+
Housing unit value	-	-	-	n.a.
Effort				
Saving/Housing unit value		+	+	
Monthly Saving/Monthly Income	+			
Saving/SISBEN Level or Score[6]				+
Saving time	+	+	+	+
Number of previous applications		+	+	+

Source: Ministry of Environment, Housing and Regional Development (MAVDT)

[6]Income level if the granting institution is a Family Welfare Agency

Table 3 Assigned Subsidies by Type of Solution

(As a % of total value assigned)

	Purchase		Self-construction		Improvement		Renting	
	Part.	**Real Growth**	**Part.**	**Real Growth**	**Part.**	**Real Growth**	**Part.**	**Real Growth**
2003	79,1	n.a.	20,6	n.a.	0,2	n.a.	-	n.a.
2004	74,8	191,3	7,3	9,5	0,2	180,8	17,6	n.a.
2005	88,7	13,3	8,2	7	0,3	54	2,7	-85,4
2006	93,3	26,1	5	-26,8	0,5	79,2	1,2	-47,1
2007	82,4	-3,3	3,2	-29,5	3,7	684,8	10,6	884,5
2008	75,8	-5	1,5	-51,3	13,2	267,7	9,4	-8,3
2009	83,1	-2,8	6,6	285,2	8,6	-42,3	1,7	-84
03-09*	82,5	36,6	7,5	32,4	3,8	204	6,2	131,9

Source: Ministry of Environment, Housing and Regional Development (MAVDT)

Notes: *Average; n.a: not available

Table 4 Partial Credit Guarantees for Social Housing

National Guarantee Fund

	Estimated Loss - Findeter	Rediscount - Findeter	Agreement Govt - Intermediaries	Improvement
Maximum Loan Value	108 mw	108 mw	54 mw	60 mw
Loan Purpose	Purchase, Improvement or Self-construction	Purchase, Improvement or Self-construction	Purchase	Improvement
Coverage	70% of the expected loss	50% of the outstanding debt	70% of the expected loss	50% to 70% of the outstanding debt
Housing Maximum Value	135 mw	135 mw	70 mw	Any type of housing
Monthly Fee Charge	0.0943% + VAT	0.0943%+VAT	Covered by the Government	0.1% plus VAT

Source: National Guarantee Fund

Table 5 Housing Credit in Colombia (% of households)

	2003 Quality of Life Survey *		2008 Quality of Life Survey **	
Housing Credit	No. Households	%	No. Households	%
No	656.792	86,46	780.037	77,89
Yes	102.866	13,54	221.404	22,11
Total	759.658	100	1.001.441	100

Sources: 2003 Quality of Life Survey (DANE), 2008 Quality of Life Survey (DANE)

Notes: * The survey provides credit information on dwellings acquired between 1998 and 2002.

** The survey provides credit information on dwellings acquired between 2003 and 2007.

Table 6 Housing Subsidy in Colombia (% of households)

	2003 Quality of Life Survey *		2008 Quality of Life Survey **	
Housing Subsidy	No. Households	%	No. Households	%
No	697.273	91,79	11.090.020	98,81
Yes	62.384	8,21	133.054	1,19
Total	759.658	100	11.223.074	100

Sources: 2003 Quality of Life Survey (DANE), 2008 Quality of Life Survey (DANE)
Notes: * The survey provides credit information on dwellings acquired between 1998 and 2002.
** Information on subsidies is provided for the previous 12 months before the survey was conducted.

Table 7 Results of the Quality of Dwelling Index

	Component 1	
	2003	2008
House Conditions		
Access to water	0,3167	0,3229
Access to sewerage	0,3464	0,3443
Access to electricity	0,3238	0,3208
Access to toilet services	0,342	0,3518
Access to rubbish collection services	0,3474	0,3028
Walls made of Bricks	0,2983	0,2174
Walls made of Adobe	-0,0698	0,0266
Walls made of Wattle	-0,0923	-0,064
Walls made of Wattle and daub	-0,1421	-0,1149
Walls made of Wood	-0,1644	-0,1898
Walls made of Prefabricated Material	0,0292	0,1577
Walls made of Bamboo, cane, another plant	-0,1251	-0,1529
Walls made of Zinc, Cloth	-0,1007	-0,1125
Floors made of Parquet, marble	0,1648	0,2214
Floors made of Carpet	0,2195	0,1725
Floors made of Vinyl, tiles, bricks	0,1857	0,1704
Floors made of Wood, Other plant	-0,1421	-0,1234
Floors made of Cement	-0,0762	-0,103
Floors made of Dirt	-0,2348	-0,2412
Cooking in kitchen	0,1514	0,2091
Cooking in bedroom	-0,0682	-0,1099
Cooking in livingroom with sink	0,0451	0,0115
Cooking in livingroom without sink	-0,0546	-0,1323
Coooking in courtyard/corridor/outdoors	-0,1935	-0,165
No place for cooking	-0,0022	-0,0618

Source: Author's calculations based on 2003 Quality of Life Survey (DANE) and 2008 Quality of Life Survey (DANE)

Table 8 Average Treatment Effects on Quality of Dwelling
Social housing (1st to 7th income deciles)

		2003[a]		2008[b]	
Treatment	**ATT**	**P-Value**	**Bootstrap Std Error**	**P-Value**	**Bootstrap Std Error**
Housing Credit	0.178**	0,035	0,084	0,028	0,065
Housing Subsidy	0.356***	0	0,086	0,582	0,07

Source: Author's calculations based on 2003 Quality of Life Survey (DANE) and 2008
Note: a. The survey provides credit and subsidy information on dwellings acquired
b. The survey provides credit information on dwellings acquired between 2003 and 2007.
provided during the previous 12 months before the survey was conducted.
Coefficient significant at ***1% level, ** 5% level, *10% level

Table 9 Results of the Quality of Life Index

	Component 1	
	2003	2008
Human Capital		
No education	-0,14	-0,12
Primary Education	-0,10	-0,09
Secondary Education	0,07	0,04
High Education	0,17	0,18
Children 7 to 11 not attending school	-0,13	-0,09
Access to health services	0,12	0,08
Socio-demographic variables		
High economic dependency	-0,13	-0,12
Crowding	-0,14	-0,16
House Conditions		
Access to water	0,21	0,18
Access to sewerage	0,23	0,21
Access to electricity	0,22	0,19
Access to toilet services	0,24	0,24
Access to rubbish collection services	0,24	0,19
Walls made of Bricks	0,20	0,17
Walls made of Adobe	-0,06	0,00
Walls made of Wattle and daub	-0,07	-0,05
Walls made of Wattle	-0,11	-0,10
Walls made of Wood	-0,12	-0,13
Walls made of Prefabricated Material	0,02	0,06
Walls made of Bamboo, cane, another plant	-0,11	-0,12
Walls made of Zinc, Cloth	-0,10	-0,09
Floors made of Parquet, marble	0,11	0,17
Floors made of Carpet	0,16	0,15
Floors made of Vinyl, tiles, bricks	0,12	0,14
Floors made of Wood, Other plant	-0,09	-0,08
Floors made of Cement	-0,08	-0,12
Floors made of Dirt	-0,17	-0,19
Cooking in kitchen	0,12	0,16
Cooking in bedroom	-0,07	-0,10
Cooking in livingroom with sink	0,03	0,00
Cooking in livingroom without sink	-0,04	-0,09
Coooking in courtyard/corridor/outdoors	-0,14	-0,14
No place for cooking	-0,02	-0,05
Availability of bathroom	0,24	0,23

	Component 1	
	2003	2008
Physical capital		
Washing machine	0,22	0,21
Refrigerator	0,21	0,21
Stove	0,22	0,17
Computer	0,22	0,25
Vehicle	0,16	0,18
Television	0,22	0,21
Subjective conditions		
Subjective poor	-0,18	-0,18
Excellent life conditions (subjective)	0,12	0,15
Good life conditions (subjective)	0,08	0,09
Acceptable life conditions (subjective)	-0,09	-0,12
Bad life conditions (subjective)	-0,08	-0,14

Source: Author's calculations based on 2003 Quality of Life Survey (DANE) and 2008 Quality of Life Survey (DANE)

Table 10 Average Treatment Effects on Quality of Life
Social housing (1st to 7th income deciles)

	2003[a]			2008[b]		
Treatment	**ATT**	**P-Value**	**Bootstrap Std Error**	**ATT**	**P-Value**	**Bootstrap Std Error**
Housing Credit	0.169*	0,091	0,1	0.161*	0,093	0,096
Housing Subsidy	0.379**	0,034	0,179	-0,059	0,667	0,137

Source: Author's calculations based on 2003 Quality of Life Survey (DANE) and 2008

Note: a. The survey provides credit and subsidy information on dwellings acquired

b. The survey provides credit information on dwellings acquired between 2003 and 2007.

provided during the previous 12 months before the survey was conducted.

Coefficient significant at ***1% level, ** 5% level, *10% level

Table 11 Marginal Effects of the Housing Credit Equation and Housing Subsidy Equation, 2003
Social housing (1st to 7th income deciles)

	Housing Credit		Housing Subsidy	
	Probit Model	Maddala Adjustment	Probit Model	Maddala Adjustment
Housing Subsidy	0.117***			
	(0,251)			
Predicted Value: Housing Subsidy		-0,033		
		(1,737)		
Housing Credit			0.149***	
			(0,211)	
Predicted Value: Housing Credit				0,152
				(0,000)
Age of Head	0,008	0,01	0.008*	0.015*
	(0,054)	(0,056)	(0,029)	(0,049)
Age of head (squared)	0,000	0,000	0,000	-0.000*
	(0,001)	(0,001)	(0,000)	(0,001)
Female	-0.055**	-0.050*	0.064**	0.084**
	(0,284)	(0,290)	(0,147)	(0,192)
Household size	-0,006	-0,006		
	(0,056)	(0,053)		
Informal Worker	0,005	-0,001	-0,036	-0,046
	(0,176)	(0,174)	(0,160)	(0,168)
Assets Index	0.047**	0.050**	-0,006	-0,003
	(0,182)	(0,198)	(0,143)	(0,191)
Income quintile 1	0,004	0,016	0,062	0,081
	(0,271)	(0,268)	(0,244)	(0,336)
Income quintile 2	-0.038	-0,031	0,062	0,082
	(0,266)	(0,319)	(0,247)	(0,342)
Income quintile 3	-0,010	0,001	0,061	0,068
	(0,153)	(0,221)	(0,220)	(0,305)
Primary Education	-0.139***	-0.150***		
	(0,280)	(0,310)		
Secondary Education	-0.062***	-0.069**		
	(0,252)	(0,291)		
Married Head / Cohabiting couple	-0,002	0,000		
	(1,044)	(0,357)		
Divorced/Widowed Head	-0,027	-0,022		
	(1,179)	(0,418)		
Urban	0,014	0,004	-0.080***	-0.077**
	(0,229)	(0,211)	(0,170)	(0,189)
Head has a credit card	0,031	0,026		
	(0,491)	(0,485)		
Head has a programmed savings account			0.350***	0.244**
			(0,297)	(0,354)
Crowding			-0,008	-0,034
			(0,170)	(0,211)
Observations	660	641	814	624
Pseudo R	0,206	0,179	0,127	0,103

Source: Author's calculations based on 2003 Quality of Life Survey (DANE)
Bootstrap standard errors in parentheses. Regional dummies not reported.
Coefficient significant at ***1% level, ** 5% level, *10% level

Table 12 Marginal Effects of the Housing Credit Equation and Housing Subsidy Equation, 2007
Social housing (1st to 7th income deciles)

	Housing Credit		Housing Subsidy	
	Probit Model	Maddala Adjustment	Probit Model	Maddala Adjustment
Housing Subsidy	0.069***			
	(0,075)			
Predicted Value: Housing Subsidy		0.144***		
		(0,327)		
Housing Credit			0.018***	
			(0,000)	
Predicted Value: Housing Credit				-0,036
				(0,260)
Credit Score	-0.000045***	-0.000048***		
	(0,000)	(0,000)		
Temporary Job Contract	0.030**	0.032**		
	(0,092)	(0,092)		
Permanent Job Contract	0,017	0,020		
	(0,089)	(0,089)		
Age of Head	-0.006***	-0.006***	-0.002***	-0.002*
	(0,012)	(0,012)	(0,010)	(0,011)
Age of Head	0.000***	0.000**	0,000	0,000
	(0,000)	(0,000)	(0,000)	(0,000)
Primary Education	0,099	0.101***	0,000	-0,004
	(1,801)	(1,741)	(1,635)	(1,574)
Secondary Education	0,178	0,18	-0,001	-0,009
	(1,802)	(1,739)	(1,630)	(1,575)
High Education	0,157	0,157	0,006	-0,009
	(1,799)	(1,739)	(1,630)	(1,575)
Married head / Cohabiting couple	-0.017***	-0.017***	-0.004**	-0,006
	(0,034)	(0,034)	(0,029)	(0,035)
Widowed head / Divorced head	0,009	0,009	-0,003	-0,001
	(0,060)	(0,061)	(0,062)	(0,076)
Male	0,007	0,006	0,000	-0,004
	(0,032)	(0,032)	(0,029)	(0,033)
Loan used to acquired a new house	0.040***	0.034***	0.059***	0.092***
	(0,031)	(0,038)	(0,043)	(0,045)
Log of household income	-0.249***	-0.246***	-0.019***	-0.057***
	(0,033)	(0,034)	(0,029)	(0,052)
1st income quintile			0.063***	0.146***
			(0,064)	(0,208)
2nd income quintile			0.039***	0.112***
			(0,064)	(0,204)
3rd income quintile			0.014***	0.064**
			(0,067)	(0,181)
4th income quintile			0,006	0.029*
			(0,068)	(0,132)
No. of dependent household members	0.018***	0.018***	0.002***	0.005***
	(0,017)	(0,017)	(0,015)	(0,017)
Observations	18.976	18.537	28.388	18.252
Pseudo R	0,486	0,487	0,322	0,292

Source: Author's calculations based on private bank dataset

Bootstrap standard errors in parentheses. Regional dummies not reported.

Coefficient significant at ***1% level, ** 5% level, *10% level

Table 13 Marginal Effects of the Loan Guarantee Equation

Dependent variable: Loan Guarantee	Only Social Housing Loans
Credit Score	-0.000*
	(0,000)
Permanent Job Contract	0,01
	(0,090)
Temporary Job Contract	0,016
	(0,092)
Age	0
	(0,009)
Age squared	0
	(0,000)
Primary Education	-0,087
	(0,345)
Secondary Education	-0,114
	(0,343)
High Education	-0.173**
	(0,344)
Married head / Cohabiting couple	-0.042***
	(0,027)
Widowed head / Divorced head	-0,019
	(0,056)
Male	0.012*
	(0,026)
Loan used to acquired a new house	0.035***
	(0,027)
Log of household income	-0.183***
	(0,022)
No. of dependent household members	0.027***
	(0,013)
Observations	18.974
Pseudo R	0,163

Source: Author's calculations based on private lender dataset

Robust standard errors in parentheses. Regional dummies not reported.

Coefficient significant at ***1% level, ** 5% level, *10% level

Table 14 Marginal Effects of the Default Equation

Dependent variable: Default	(1) All Housing Loans	(2) Only Social Housing Loans
Social housing loan	0.035***	
	(0,076)	
Loan guarantee		0.014***
		(0,042)
Permanent Job Contract	0,013	0,011
	(0,154)	(0,162)
Temporary Job Contract	0,014	0,01
	(0,156)	(0,165)
Age	0,000	0,000
	(0,013)	(0,014)
Age squared	0,000	0,000
	(0,000)	(0,000)
Primary Education	-0,005	-0,007
	(0,079)	(0,081)
Secondary Education	0.009***	0.012***
	(0,043)	(0,044)
Married head / Cohabiting couple	0,004	0,005
	(0,043)	(0,045)
Widowed head / Divorced head	-0,003	-0,008
	(0,091)	(0,098)
Male	0,003	0,004
	(0,040)	(0,042)
Loan used to acquired a new house	-0.008***	-0.011***
	(0,039)	(0,041)
Log of household income	0,003	0.010**
	(0,036)	(0,041)
No. of dependent household members	0.004***	0.005***
	(0,019)	(0,020)
Observations	18.907	14.722
Pseudo R	0,048	0,025

Source: Author's calculations based on private lender dataset

Robust standard errors in parentheses. Regional dummies not reported.

Coefficient significant at ***1% level, ** 5% level, *10% level

Table 15 Marginal Effects of the effect of loan guarantees on housing loans

Dependent variable: Housing Loans	R.E. Model	Dependent variable: Housing Loans
NFG loan guarantees program (dummy)	-0,197	**META**
	(0,314)	
Regional GDP per capita (logs)	-2,299	**NARIÑO**
	(1,981)	
Regional unemployment rate	-11.408***	**NORTE DE SANTANDER**
	(5,734)	
Bankarization of the region [a]	-63,062	**RISARALDA**
	(83,746)	
2006	-0.897***	**SANTANDER**
	(0,302)	
2008	-1,413	**SUCRE**
	(0,893)	
BOLÍVAR	-2,58	
	(2,268)	**Constant**
CALDAS	-8.330***	
	(2,176)	
CAQUETA	-7.469***	
	(3,657)	
CESAR	-3,8	
	(2,951)	
CÓRDOBA	-8.494***	
	(2,945)	
CUNDINAMARCA	-2.529***	
	(0,662)	
HUILA	-5.842***	
	(2,559)	
MAGDALENA	-4,72	
	(2,954)	
Observations	186	
Number of municipalities	62	

Source: Author's calculations based on NFG dataset, DANE, and Asobancaria

a. proportion of regional savings accounts to the total national