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HOUSEHOLD DEBT IN MEXICO: A STUDY ON THE DETERMINANTS OF THE FINANCIAL BURDEN AND DEFAULT RISK

LA DEUDA DE LOS HOGARES EN MEXICO: UN ESTUDIO DE LOS DETERMINANTES DE LA CARGA FINANCIERA Y EL RIESGO DE INCUMPLIMIENTO

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Abstract

This research analyses the financial management of household debt in México, identifying the determinants and potential simultaneity of the financial burden and non-payment of acquired credit. The National Household Financial Survey (ENFIH, 2019) is used to estimate a maximum likelihood mixed strategy combining a Heckit-Heckprobit model for the financial burden and the probability of default, respectively. This approach corrects for selection bias to consistently estimate the socioeconomic determinants of financial burden and default risk. The estimates suggest that income, wealth, household

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debt, debt concentration index, and debt quality are the relevant variables in explaining financial burden and debt default. Similarly, the results show that both processes are determined simultaneously and are complementary. The study's main contribution is to provide consistent estimates of the probability of default and financial burden, determining the correlation between the unobservable variables of both models. These findings can inform regulatory policy to reduce systemic household risk and improve consumer protection. Our results identify the sources of systemic and shared risk of debt instruments for financial intermediaries, such as credit cards and departmental credit.

Keywords: *Household debt, probability of default, financial burden, México.*

JEL Classification: *D1, D14, G5, G51, C58*

Resumen

Esta investigación analiza la gestión financiera del endeudamiento de los hogares en México, identificando los determinantes y la potencial simultaneidad de la carga financiera y el impago del crédito adquirido. Se utiliza la Encuesta Nacional Financiera de los Hogares (ENFIH, 2019) para estimar una estrategia mixta de máxima verosimilitud que combina un modelo Heckit-Heckprobit para la carga financiera y la probabilidad de impago, respectivamente. Este enfoque identifica consistentemente los efectos socioeconómicos de ambos procesos al corregir su potencial sesgo de selección en el acceso al crédito. Las estimaciones sugieren que el ingreso, la riqueza, el endeudamiento de los hogares, el índice de concentración de la deuda y la calidad de la deuda son las variables relevantes para explicar la carga financiera y el impago de la deuda. De igual forma, los resultados muestran que ambos procesos se determinan de manera simultánea y son complementarios. La principal contribución del estudio es proporcionar estimaciones consistentes de la probabilidad de impago y la carga financiera, determinando la correlación entre las variables no observables de ambos modelos. Este análisis puede complementar las políticas regulatorias y de protección a los usuarios del sistema financiero, mitigando el riesgo sistemático de los hogares en el sistema financiero. También ayuda a entender las fuentes de riesgo sistemático y compartido de los instrumentos de deuda para intermediarios financieros, como las tarjetas de crédito y el crédito departamental.

Palabras clave: *Deuda del hogar, probabilidad de impago, carga financiera, México.*

Clasificación JEL: *D1, D14, G5, G51, C58*

1. INTRODUCTION

The administration of resources through the financial system constitutes a fundamental pillar for the efficient functioning of a market economy. Using savings, credit, investment, and insurance allows the optimization of the liquidity planning and risk management of economic agents, such as individuals, households, companies, and governments, between contingent states and over time (Townsend, 2004).

Under this approach, access to the credit market provides individuals and households with opportunities to take advantage of investment projects and risk diversification. It also facilitates the acquisition of goods and services, providing financial flexibility to face emergencies or crises. It also allows the accumulation of wealth and the dynamic distribution of income among households (Greenwood and Jovanovich, 1990).

Access to credit contributes to building a credit history, increasing the availability of resources in various financial institutions, improving the quality of life of individuals, and contributing to long-term economic well-being. However, effective debt management is critical, as mismanagement can result in over-indebtedness or insolvency. While credit access offers a large set of benefits for liquidity management, sound debt management is essential to mitigate default risk and maintain long-term financial resilience.

In this context, financial burden becomes a critical variable when assessing household vulnerability. A high financial burden would indicate insufficient debt repayment resources, which may have adverse financial consequences and limit borrowing capacity. Thus, identifying the determinants of financial burden is essential for evaluating household creditworthiness.

Lending institutions assess borrower information to optimize credit allocation and mitigate default risk. This information confers advantages to the negotiation and establishment of contractual terms. Financial institutions are constantly faced with the possibility that applicants for loans or other debt instruments may have incentives to distort or conceal information to secure the desired financing. In this context, credit risk assessment plays a fundamental role in these institutions' financial stability, allowing them to make informed decisions about the risks they take. According to Chan (2006), estimating the probability of debtors' default is the first step in assessing credit exposure and potential losses a financial institution may face. Therefore, this impact analysis is essential for granting financing to any credit instrument.

Inadequate debt management has adverse consequences for the debtor and creditor, so the debt default indicator becomes relevant for financial system participants, especially for financial institutions and economic policymakers. Both sectors require a detailed assessment of the probability of default on debt payments to control the risk of default and its potential ramifications and to develop policies that promote the stability and growth of the financial system.

Among different economic agents, households play a fundamental role in the analysis of financial institutions. According to the National Institute of Statistics

and Geography (INEGI) for 2019, 56.9% of Mexican households, equivalent to 20.9 million, had some instrument of debt, whether mortgage or non-mortgage. This finding indicates that households in México access various forms of debt instruments. Therefore, contracting one or several debt instruments emerges as a relevant aspect in the study of indebtedness. Acquiring multiple instruments can positively and negatively impact household debt management, which is defined as the financial burden and risk of defaulting on debt payments.

This study examines the influence of sociodemographic and financial factors on Mexican households' debt burden and likelihood of default. It also examines the implications of debt concentration versus diversification across multiple credit instruments.

To estimate the relationship between household characteristics and financial outcomes, the Heckman sample selection model is used for financial burden, and a Probit model corrected for sample selection ("Heckprobit") for default. In both cases, the potential selection bias associated with access to the debt market is controlled and corrected. Subsequently, a multivariate mixed process is estimated, given the possible simultaneity between the financial burden and debt default.

This research contributes to the literature on financial and household economics in three dimensions. First, considering the review of different literature sources, this is the first study in México to analyze household indebtedness through the financial burden and the probability of defaulting on debt repayment. Second, this study applies an underutilized dataset, the National Survey of Household Finances (ENFIH), within the context of household financial analysis in México. Third, studying the determinants of the financial burden and probability of defaulting on debt for households in México is relevant to public policy themes. In addition to recovering consistent parameters, it allows us to capture the correlation between unobservable variables (both financial burden and probability of default), representing a novel application of this empirical approach to studying household indebtedness in México.

Regarding financial burden, this study provides valuable information on the financial health of households, identifying financial risks, and taking preventive measures. Additionally, it facilitates household planning, as it supports household financial planning by clarifying the relationship between income, expenditures, and credit obligations. Regarding default behavior, the analysis provides insight into households' capacity to manage financial obligations. In addition, it is essential to develop public policies related to regulatory and consumer protection issues and provide information for designing measures to mitigate the systemic risk faced by households.

The findings from the analysis align with established evidence in existing literature. In particular, the findings suggest that variables such as income level, wealth, debt concentration, and debt quality are negatively correlated with Mexican households' financial burden and debt default. However, the level of debt is positively associated with both dependent variables. The variables that determine access to the household

debt market are wealth, education, gender, age, and employment status of the household head, as well as where the household is located.

It is essential to consider the potential limitations of this study. Although the ENFIH allows us to construct a fundamental variable for our research that no other base will enable us to obtain, the default on debt payment by the household. We also have the limitation of being able to carry out the study considering only one year, since the base is only available for 2019. This limitation represents a restriction in terms of the temporality of the analysis since we lose significant effects that can only be identified over time, such as the impact of the COVID-19 pandemic. This case would be interesting, as the pandemic caused substantial changes in the consumption patterns of individuals.

This paper is organized into seven sections, beginning with the introduction. Section two reviews the literature on the financial burden and the likelihood of debt default. Section three describes the data sources and variables used in the analysis. Section four outlines the econometric strategy employed. Section five presents the empirical results, followed by section six, which discusses the policy implications. Finally, section seven concludes with a summary of the key findings and their broader implications.

2. LITERATURE REVIEW

According to the International Monetary Fund (IMF, 2017), household indebtedness plays a crucial role in the economy; however, the short-term benefits of increased debt have, as a counterpart, medium-term costs, and therefore, its study is a matter of interest for public policy analysis. For example, in the short run, household indebtedness boosts the economic system as firms hire more workers to meet aggregate demand needs stimulated by current spending through credit. However, households with high debt levels may have to reduce their spending to repay such loans, which could slow economic growth.

In this sense, there is a relevant interest in understanding the behavior of household credit use and its interconnection with other fundamental variables in an economic context. However, the literature on this topic is not very extensive, given the lack of reliable information on financial conditions at this level of disaggregation.

The empirical study of indebtedness can be analyzed from two perspectives. The first approach contemplates access to the debt market as a study variable, considering that if a household has some credit, it is indebted and participates in this market. The second perspective consists of analyzing the variations in the levels of indebtedness, considering that this can range from zero (the household has no debt) to infinity (the maximum value of the debt contracted by a household).

Farinha (2007) studied the indebtedness of Portuguese households, considering a binary probabilistic model (Probit) and a model based on a limited dependent

variable (Tobit). This paper has found that income, age, education, household size, and employment status of the head of household significantly influence the probability that a household has access to debt and its level of indebtedness.

Díaz *et al.* (2019) investigated the determinants of Mexican household indebtedness using a neural network methodology. Their study uses variables such as the age, sex, and education of the head of household. It also employs socioeconomic stratum, debt, and credit card payments. Finally, the authors found that credit card ownership is the most critical variable in explaining household indebtedness.

Piovarči (2021) analyzed the effect of socioeconomic and demographic factors on the indebtedness of Slovak households using a logit-type methodology. The author found that household wealth, size, and number of children affected the participation of Slovak households in the debt market. However, she finds no statistical evidence that income affects household indebtedness.

Wong *et al.* (2023) investigated the disparities in the impacts of households' characteristics on their indebtedness and consumption in Malaysian households. These authors employed a simultaneous equations model, and the results reveal that the gender of the household head, residential areas, and income groups have differential effects on household consumption and indebtedness through predetermined variables. Specifically, results showed that indebtedness has a negative effect on household consumption for the middle-income group (M40); savings are negatively associated with consumption for households living in rural areas and the M40 group. Furthermore, income is positively associated with consumption for rural households, especially when the household head is female. Finally, household size also had a positive effect on consumption.

Leclaire (2023) analyzed the role of household debt in economic growth from the post-Keynesian approach. The author finds that household debt does matter to financial stability. It influences the consumption levels of households, the rate of return on mortgage and other debt held by banks and other financial institutions, the rate of return on the production of goods and services, and the overall well-being of households. The author mentions that the issue of household debt can be tackled from two sides. From the income side, creating a work environment that is favorable to unions and a job guarantee program would help. From the expenditure side, providing Medicare, childcare, eldercare, higher education, and potentially housing, would remove the reasons why households acquire sometimes unsustainable debt.

Martín-Legendre and Sánchez-Santos (2024) analyzed the evolution of Spanish households' indebtedness and financial vulnerability. The results showed a growing debt participation of Spanish households and an increase in the stock of outstanding debt of indebted households, a trend that reversed with the end of the Great Recession. Furthermore, the percentage of financially vulnerable households according to three indicators grew dramatically until the end of the downward phase of the last economic cycle. It showed considerable signs of improvement during the second half of the 2010s. These results, however, called attention to the number of Spanish households unable to service their debts in the face of an economic downturn.

Montani-Martins *et al.* (2024) analyzed the evolution of Brazilian households' indebtedness and financial fragility from 2005 to 2023. The hypothesis is that this period of 'Great Indebtedness' is related to an increase in Brazilian households' financial fragility. They developed a theoretical framework based on Minsky's insights on managing cash flows and balance sheets. From an empirical analysis of descriptive statistics, these authors argued that periods of increase in indebtedness are not necessarily contemporary to periods of increasing financial fragility: for instance, the COVID-19 crisis prompted a significant increase in indebtedness, but other policies such as unconditional cash transfers were able to provide the necessary cash-flows for Brazilian households managing their 'survival constraints' in a more flexible way. Despite this, they highlight that household indebtedness and financial fragility are significant features of Brazil's current economic and social degradation.

On the other hand, another issue related to household debt is over-indebtedness, which goes beyond whether a household has contracted debt, but considers that the total debt exceeds a certain level to such an extent that it is detrimental to the household's standard of living. From this perspective, Eichhorn (2020) used a logistic regression model with fixed effects to find the determinants of over-indebtedness in Chilean households. This author finds that the income and occupation status of the household head reduce the probability of over-indebtedness. Additionally, households led by females and household heads under 35 are more vulnerable to over-indebtedness. Finally, it shows that consumer debt is riskier than educational and mortgage debt.

From another perspective, once households become indebted, knowing how to manage the payment of contracted obligations adequately is essential. Otherwise, this can lead to financial instability in household finances, with debt default being the most severe situation they face. This phenomenon has also gained great relevance among researchers. We found little literature on the subject, but it was enough to support this research.

Alfaro and Gallardo (2012) studied the default of Chilean households in the mortgage and consumer sectors. These authors used a Probit model with selection bias correction to explain default. Among the main results, they found that the level of income and having a bank account significantly impact the reduction of the probability of defaulting on any of the debts contracted. In addition, they argue that the level of education is a factor that is negatively related to mortgage debt default. At the same time, the age of the household head and the number of people in the household positively impact consumer debt default.

Following this line of research, Costa (2012) compares the probability of debt default between households with only mortgage debt and those with any other type of debt in Portugal using a binary logit model to estimate the dependent variable. This author finds similar results to previous authors, where variables such as employment, education, and age of the household's reference person have an inverse relationship with the probability of debt default. On the other hand, when the household faces adverse changes in its financial situation, this causes an increase in the probability of defaulting on the household's obligations.

Additionally, Ormazabal (2014) studied the variables that affect Chileans' credit default rate. Using a Probit model and variables such as marital status, sex, and income decile of individuals, this study finds that, generally, women default less than men. Widows report a lower default rate for consumer loans; those in the fifth income quintile have the highest default rates. Individuals in the second income decile show the highest default rates for consumer credit, and single individuals show the lowest rates.

Barbaglia *et al.* (2020) used residential mortgages to investigate the loan default behavior in several European countries. The authors modeled the default occurrence as a function of borrower characteristics, loan-specific variables, and local economic conditions, comparing the performance of machine learning algorithms relative to logistic regression. Machine learning algorithms performed significantly better in providing predictions. The interest rate and local economic characteristics were the most relevant variables in explaining loan default. The relevant geographical heterogeneity in the variable importance pointed to the need for regionally tailored risk-assessment policies in Europe.

Saha *et al.* (2022) addressed the probability of default from the perspective of housing loans. The authors examined the drivers of default in the Malaysian housing market and considered the endogeneity of loan-to-value (LTV) in predicting housing loan default and its implications. Employing an instrumental variable probit regression, these authors find that the interest rate is less relevant in predicting loan default. Other loan characteristics, such as loan age, tenure, payment amount, and the built-up area, are relevant. The results confirm that the borrower's location matters, and an increase in state gross domestic product per capita and the supply of residential units reduce default probability.

Thus, considering the review of different literature sources on the analysis of indebtedness through the financial burden and probability of debt default, no studies related to these topics have been identified for México, which is the primary motivation for developing this research. In addition, this study aims to identify the factors that determine Mexican households' financial burden and debt default probability, as well as the household's impact on these two variables when it concentrates its debt on one or several credit instruments.

3. DATA AND VARIABLES

3.1. Information sources

This research uses México's National Survey of Household Finances (Encuesta Nacional sobre las Finanzas de los Hogares, ENFIH). The ENFIH is a nationally representative survey whose main objective is to collect information on the financial situation of households in México, covering both their assets and liabilities (financial and non-financial). In addition, this survey collects data regarding flows and stocks and

provides detailed information on the sociodemographic characteristics of household members in México.

ENFIH is the result of a collaboration between Banco de México and the National Institute of Statistics and Geography (INEGI), and its results were published for public access as of November 2021.

The sample was composed of 17,386 households, of which only people over 18 years of age were interviewed. A limitation of our study is that this survey was conducted only in 2019, so we cannot perform temporal comparative analyses; we can only stick to analyses that use cross-sectional data.

3.2. Dependent variables: financial burden and default on debt payment

This research considers two dependent variables: financial burden and debt default. First, it is necessary to determine the financial burden on households and then classify households in a debt default situation. For this purpose, household debt data, broken down by instrument type, are presented in Appendix Table V. In the context of the Mexican economy for the sample year, the debt instrument most contracted by households was credit cards (34.3%). On the other hand, the least used credit is auto loans (6.6%). Figure 1 shows the use of debt instruments by Mexican households.

In turn, Gutiérrez *et al.* (2011) define a continuous variable that measures the relationship between monthly household debt service and effective monthly income, which they call financial burden. Figure 2 shows the heterogeneity in the financial burden reported by households in México by income quintiles. This figure shows that lower-income households face the highest financial burden since approximately 21% of their income is spent on debt incurred. This result coincides with the findings of Chancel *et al.* (2022), who assert that, in México, the poorest half of the population lacks wealth as their net wealth is negative, meaning that this group has, on average, more debt than assets.

The first variable under study is formulated as follows:

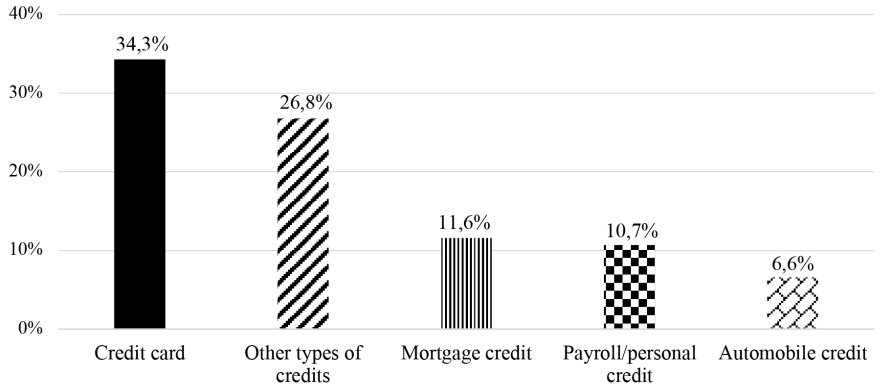
$$\text{Financial Burden: } F_i = \frac{SdM_i}{IME_i} \tag{1}$$

where F_i = Household financial burden, SdM_i = Monthly debt service, and IME_i = Effective monthly income. For the second variable, in this study, a household defaults on debt payment when it presents more than three states of default in any debt instrument, according to existing banking regulations[1].

[1] Existing banking regulations state that a consumer or housing loan is in arrears (overdue portfolio or stage 3, according to the new IFSR9 rules) when it is three months or more in arrears in a row. However, from the ENFIH it is not possible to deduce whether the arrears are consecutive or dispersed.

FIGURE 1

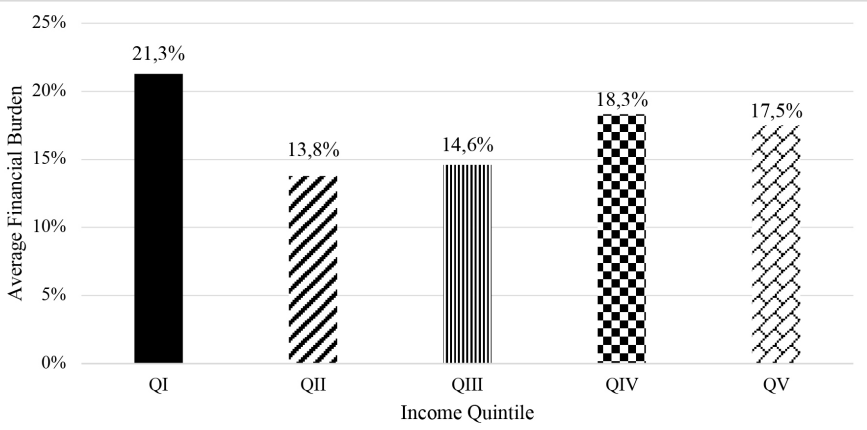
DEBT HOLDINGS OF MEXICAN HOUSEHOLDS BY TYPE OF INSTRUMENT (2019)



Source: Authors' elaboration with data from ENFIH 2019 (INEGI, 2021).

FIGURE 2

AVERAGE FINANCIAL BURDEN BY INCOME QUINTILE OF MEXICAN HOUSEHOLDS (2019)



Source: Authors' elaboration with data from ENFIH 2019 (INEGI, 2021).

Once the debt contracts of Mexican households are determined, a dichotomous variable is constructed that takes the value of one if a household defaults on any of the instruments mentioned in Table V (appendix) that it has contracted and zero otherwise. Figure 3 shows the probability of debt default by income quintiles for

Mexican households. This figure describes how the probability of default on debt repayment decreases from QI to QIII; however, in QIV, the probability increases. This result could be related to credit access since higher-income households have higher holdings of financial assets (Cárdenas *et al.*, 2022). Therefore, they also have a higher possibility of contracting a higher amount of debt, which makes them more susceptible to debt defaults.

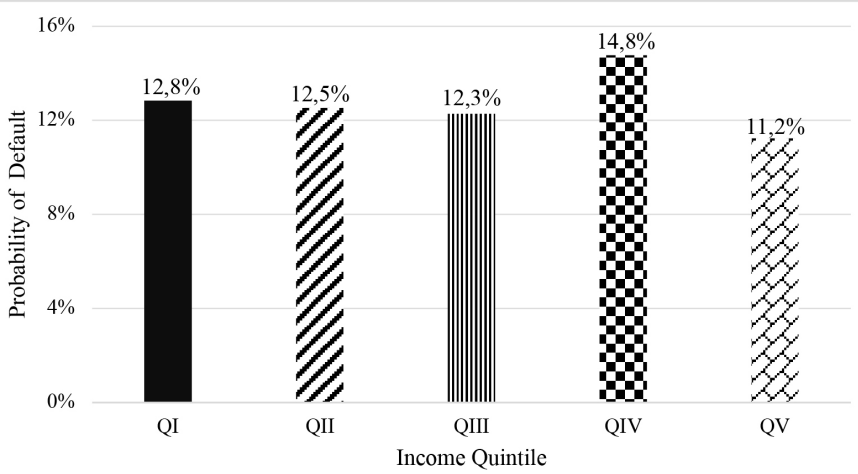
Additionally, the representation of the second variable is shown:

$$\text{Non-payment of debt: } I_i \begin{cases} 1 & if \quad I_i^* > 3 \\ 0 & otherwise \end{cases} \tag{2}$$

where I_i is the default debt. For both definitions, subscript i represents the *i-th* household in the sample.

FIGURE 3

PROBABILITY OF DEFAULT BY INCOME QUINTILE OF MEXICAN HOUSEHOLDS (2019)



Source: Authors' elaboration with data from ENFIH 2019 (INEGI, 2021).

3.3. Independent variables: sociodemographic and economic-financial characteristics

Considering the previous literature analysis, Table 1 presents a summary of the observed variables considered in the specification of the models described in this research, considering the formulation, description, and authors that cite them.

TABLE 1

DEFINITION OF INDEPENDENT VARIABLES

Variables	Description	Formulation	References
Total Income	It is the natural logarithm of the total household income that includes labor and non-labor income. Earned income: • Income from financial investments • Income from the rental of real estate Income from sources other than work • Government support programs • Retirement or pension • Transfers from family or friends living within the country • Transfers from family or friends living outside the country • Rental of property (other than real estate) • Sale or pawning of goods • Profits or gains from business • Scholarships Other income	ln (Total Income)	ENFIH, 2019 Eichhorn, 2020
Wealth	It is the natural logarithm of the difference between the value of total household assets and the value of total household liabilities.	ln (Wealth)	ENFIH, 2019 Gutiérrez *et al.* 2011
Total Debt	These are liabilities of households (including nonprofit institutions that provide services to households) that require interest or principal payments by households to creditors at a fixed date in the future. Also, it is the sum of mortgage debt plus non-mortgage debt.	ln (Total Debt)	OECD, 2023 ENFIH, 2019 Gutiérrez *et al.* 2011
Education	It is a categorical variable that defines the educational level of the head of household.	1. No education. 2. Basic Education. 3. Upper-Secondary Education. 4. Bachelor's degree or equivalent. 5. Postgrad.	ENFIH, 2019 Dávila *et al.* 2021

Variables	Description	Formulation	References
Age group	It is a categorical variable that defines the age group corresponding to the head of household.	1. Under 35 years old 2. Between 35 and 44 years old 3. Between 45 and 54 years old 4. Between 55 and 64 years old 5. Between 65 and 74 years old 6. Over 75 years old	ENFIH, 2019 Díaz *et al.* 2019
Employment	It is a dichotomous variable that defines whether the head of household is employed.	0. Unemployed 1 Employee.	ENFIH, 2019 Gutiérrez *et al.* 2011
Sex	It is a dichotomous variable that defines the sex of the head of the household.	0. Female 1. Male	ENFIH, 2019 Gutiérrez *et al.* 2011
Household location	It is a dichotomous variable considering a rural area with up to 14,999 inhabitants, while the urban area is where 15,000 people or more live.	0. Rural 1. Urban	ENFIH, 2109 Dávila *et al.* 2021
Debt Concentration Index	This variable measures the distribution of debt instruments contracted by a household.	$\sum_{n=1}^{6} (si)^2$	Choi *et al.* 2018 Djolov, 2013 Dynkin *et al.* 2002
Debt quality	It is the proportion that an economic agent (company, household, individual) can be required to pay in the long term to its total debt.	$\frac{\text{Mortgage debt}}{\text{Total debt}}$	CONDUSEF, 2021

Source: Authors' elaboration considering previous literature and ENFIH 2019.

3.4. Descriptive statistics

This section presents descriptive statistics for Mexican households' most relevant financial variables. Table 2 shows that, regarding the default variable, approximately 87% of Mexican households do not default on their obligations (in this case, debt payment), and 13% do. On the other hand, the financial burden of households is between 0 and 63.3, with a mean of 0.17, indicating that Mexican households, on average, have sufficient financial resources to meet their credit obligations.

Concerning the sociodemographic variables, in most households, the head of household has a basic education, more than half of them, and on the other hand, the heads of households with a graduate degree are the least predominant in the sample, representing only 2% of the total number of households. Regarding the gender of the

head of the household, in about 69% of the households, the head is male, and 31% is female. Considering employment, about 76% of the heads of households are employed, and analyzing the type of locality, about 78% of the households are in urban areas.

The economic-financial variables show that Mexican households' average annual total income exceeds 129,500 pesos, and the average wealth[2] exceeds 758,000 pesos. Likewise, the average debt level of Mexican households is 44,000 pesos, with a minimum and maximum of zero and 13,000,000 pesos, respectively.

TABLE 2

DESCRIPTIVE STATISTICS

Variable	Remarks	Media	Std. Dev.	Minimum	Maximum
Debt default					
Current	13,929,566	0.87	0.33	0	1
In default	2,028,533	0.13	0.33	0	1
Financial burden	35,203,143	0.17	0.66	0	63.33
Education Head of Household					
No education	2,382,174	0.07	0.25	0	1
Basic	20,901,553	0.57	0.49	0	1
Upper middle school	6,245,703	0.17	0.38	0	1
Bachelor's degree and equivalent	6,310,900	0.17	0.38	0	1
Postgraduate	725,797	0.02	0.14	0	1
Sex Head of Household					
Woman	11,391,336	0.31	0.46	0	1
Man	25,253,344	0.69	0.46	0	1
Employment status: Head of Household					
Unemployed	8,852,475	0.24	0.43	0	1
Employee	27,792,205	0.76	0.43	0	1
Location					
Rural	8,061,830	0.22	0.42	0	1
Urbana	28,582,850	0.78	0.42	0	1
Debt Quality					

[2] The definition proposed by the ENFIH is taken as a reference. The ENFIH defines wealth as the difference between the value of total household assets and the value of total household liabilities. Total assets include non-financial and financial assets; total liabilities include mortgage and non-mortgage debt.

Variable	Remarks	Media	Std. Dev.	Minimum	Maximum
Poor quality	16,870,962	0.86	0.34	0	1
Good quality	2,657,448	0.14	0.34	0	1
Total income	36,644,680	162,690.70	190,629.90	0	12,400,000.00
Wealth	36,644,680	757,719.10	5,690,400.00	-12,100,000.00	909,000,000.00
Total debt	36,644,680	44,209.18	174,937.40	0	13,000,000.00
	19,528,410	0.88	0.19	0.24	1

Source: Authors' elaboration with ENFIH 2019 (INEGI, 2021).

The debt concentration index[3] for Mexican households is between 0.24 and 1, and its mean of 0.88 shows that, on average, Mexican households tend to concentrate their debt, or in other words, distribute their debt in a few credit instruments to satisfy their consumption needs. Finally, the debt quality[4] shows that most Mexican households have contracted bad-quality debt (86% of households), distributed in credit cards, payroll, and personal loans, among others.

4. ECONOMETRIC STRATEGY

To identify the potential relationship between the financial burden and the probability of default on Mexican households' debt, we start with two models that integrate the potential selection bias in access to credit and then link them in their estimation through a joint analysis.

In particular, the financial burden is analyzed as a continuous dependent variable using an approach based on a linear model that integrates the Heckman (1979) selection bias correction ("Heckit"). At the same time, the probability of debt default variable will be studied as a dichotomous limited depende[nt variable, allowing for a potential

[3] The authors construct the debt concentration index based on economic theory on competition and market share, specifically the Herfindahl-Hirschman index, which, in terms of the market, measures the participation of each of the companies that make up the market. In our case, a household debt concentration index (DCI) was developed, measured in terms of the proportion of debt represented by each credit instrument to which a household has access. If the DCI is close to 0, it implies that a household has its debt distributed in several credit instruments; on the other hand, if the DCI is close to 1, this reflects that the household has its debt distributed in one or few credit instruments (see Appendix Table 6 illustrating the calculation of the DCI).

[4] The definition of debt quality is formally used in business economics as the ratio of long-term debt to total debt. In the context of household economics, we define it as the ratio of mortgage debt to total debt. Since this type of debt is contracted for a period of more than 5 years and up to 30 years, it can be considered long-term debt. In our analysis, good quality debt is considered when this ratio exceeds 50% since this represents household contract debts that are less likely to default since, in that case, they would lose real estate.

selection bias in access to credit ("Heckprobit"). Subsequently, given the possibility that financial burden and default are determined simultaneously, both systems of equations are estimated in a single process using the maximum likelihood estimation method.

Let the financial burden be defined as a continuous variable F_i. It depends on a set of observed variables[5] X_i^F through a vector of coefficients β^F (which includes a constant) and a set of unobserved variables summarized by the random variable ε_i^F.

$$F_i = X_i^F \beta^F + \varepsilon_i^F \tag{3}$$

Nonetheless, we only observe the financial burden on a set of households. The variable D_i^F determines whether we observe $\left(D_i^F = 1\right)$ or not $\left(D_i^F = 0\right)$ its value. In particular, the financial burden observability is defined by a conditional behavior in a set of observable variables Z_i^F through a vector of coefficients γ (which includes a constant). It also includes a set of unobserved variables, which is summed up by the random variable η_i^F as follows, using an indicative function $1(\cdot)$:

$$D_i^F = 1\left(Z_i^F \gamma^F + \eta_i^F \geq 0\right) \tag{4}$$

In this case, assuming that ε_i^F and η_i^F are jointly bivariate normally distributed, with zero mean, finite variances, and a covariance that empirically determines the selection bias hypothesis; it is possible to estimate a system of equations on financial burden using the maximum likelihood method, thus taking advantage of the available information.

Similarly, let us assume that default on debt payments can be defined as a dichotomous variable I_i which takes a value of 1 if the household does not pay its debt, and 0 if it is currently in its payments. This variable depends on a set of observed variables[6] X_i^I through a vector of coefficients β^I (which includes a constant) and a set of unobserved variables, which are summarized by the random variable ε_i^I as follows, using an indicative function $1(\cdot)$ as follows:

$$I_i = 1\left(X_i^I \beta^I + \varepsilon_i^I \geq 0\right) \tag{5}$$

However, we only observe debt defaults for households with access to the credit market, so there is a potential selection bias. In this case, we only observe credit default for a set of households, according to a variable that determines whether we observe a household given that it has access to the credit market. The D_i^I variable determines

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5 A detailed explanation of the observed variables (X_i^F) for the financial burden model is presented in section 3.3.

6 A detailed explanation of the observed variables (X_i^I) for the debt default model is presented in section 3.3.

whether we observe a given household that has access to the credit market $\left(D_i^I = 1\right)$) or we do not observe the household if it does not have access $\left(D_i^I = 0\right)$ its value; in particular, the observability of the burden is defined by a conditional behavior on a set of observable variables Z_i^I through a vector of coefficients γ^I (which includes a constant) and a variable and a set of unobserved variables, which is summed up by the random variable η_i^I as follows, using an indicative function $1(\cdot)$ as follows:

$$D_i^I = 1(Z_i^I \gamma^I + \eta_i^I \geq 0) \tag{6}$$

In this case, if we assume that ε_i^I and η_i^I are jointly distributed under a bivariate normal, both with zero mean, finite variances, and a covariance that empirically determines the hypothesis of selection bias; it is possible to estimate this system of equations by default using the maximum likelihood method while taking advantage of the available information.

Finally, it is possible to define a joint system using the above strategies if we consider a multivariate normal joint distribution among the four unobservable components of the different empirical specifications proposed, in particular:

$$\begin{bmatrix} \varepsilon^F \\ \eta^F \\ \varepsilon^I \\ \eta^I \end{bmatrix} = N_4 \left[\begin{pmatrix} 0 \\ 0 \\ 0 \\ 0 \end{pmatrix}, \begin{pmatrix} \sigma_{\varepsilon^F,\varepsilon^F} & \sigma_{\varepsilon^F,\eta^F} & \sigma_{\varepsilon^F,\varepsilon^I} & \sigma_{\varepsilon^F,\eta^I} \\ \sigma_{\eta^F,\varepsilon^F} & \sigma_{\eta^F,\eta^F} & \sigma_{\eta^F,\varepsilon^I} & \sigma_{\eta^F,\eta^I} \\ \sigma_{\varepsilon^I,\varepsilon^F} & \sigma_{\varepsilon^I,\eta^F} & \sigma_{\varepsilon^I,\varepsilon^I} & \sigma_{\varepsilon^I,\eta^I} \\ \sigma_{\eta^I,\varepsilon^F} & \sigma_{\eta^I,\eta^F} & \sigma_{\eta^I,\varepsilon^I} & \sigma_{\eta^I,\eta^I} \end{pmatrix} \right] = N_4\left(0_{[4]}, \Sigma_{[4X4]}\right) \tag{7}$$

This approach employs a joint multivariate normal distribution on the nonlinear system given by equations (3) to (7) and estimates the entire mixed nonlinear system through a joint likelihood function defined as parameters of interest: 1) the set of vectors given by $\{\beta^F, \gamma^F, \beta^I, \gamma^I\}$, 2) the variance-covariance matrix $\Sigma_{[4X4]}$which comprises all the unobservable variances of each term; 3) the covariance that defines the selection bias of each process studied; and 4) the potential correlation between the financial burden and the default decision.

From the joint maximum likelihood estimation of both processes, linked through a joint distribution based on a mixed normal distribution, it is then possible to identify the effects of each determinant on each household market variable, selection biases, and the complementarity between financial burden and default.

5. RESULTS AND DISCUSSION

This section presents the empirical estimates of the determinants of household financial burden and the probability of default, based on a full-information maximum likelihood approach that jointly estimates a Heckit model for financial burden and a Heckprobit model for debt default. This modeling strategy (mixed model optimizing through maximum likelihood) corrects for selection bias, given that only households with access to credit can be observed incurring debt obligations or defaults. This model allows us to recover consistent parameters of the observed variables for the financial burden and debt default of households in México. On the other hand, the financial burden and debt default models control for selection bias and test for a potential correlation between these unobservable factors, which is one of the main contributions of our methodology.

Table 3 shows individual models of financial burden (model 1: "Heckit") and debt default (model 2: "Heckprobit"), as well as a joint mixed model of both processes simultaneously (model 3: "Heckit-Heckprobit"). The latter model recovers the parameters of a mixed model through a maximum likelihood estimator, considering the potential correlation between the errors of the individual models. The financial burden model ("Heckit") seeks to find the relationship between the factors that explain the financial burden, and the debt default model ("Heckprobit") measures the probability that a household defaults on debt repayment.

Models 1 and 3 show the coefficients in terms of semi-elasticities and percentage changes, considering that several regressors (income, wealth, debt) are in natural logarithms. It is worth noticing that the results reported in Table 3 are robust and statistically significant at the 1 percent level throughout. The following subsections provide a detailed interpretation of the main findings derived from the econometric strategy.

5.1. Financial burden

The financial burden is the ratio of monthly debt service to effective monthly income. The coefficients presented in Models 1 and 3 provide strong evidence of the role of socioeconomic characteristics and debt structure in shaping this burden.

Total household income exhibits a negative and significant association with financial burden. Specifically, the coefficient of –0.295 in Model 3 implies that a 1 percent increase in total income reduces the debt burden by approximately 0.30 percentage points, holding other variables constant. This finding aligns with the notion that rising income enhances a household's debt affordability by increasing the denominator of the burden ratio more than proportionally relative to the increase in debt service.

Household wealth, in contrast, has a modest but positive association with the financial burden. A 1 percent increase in wealth is associated with a 0.03 percentage

point increase in the burden ratio. While counterintuitive at first glance, this relationship may reflect that wealthier households are more likely to access credit and to carry larger nominal debt loads, perhaps as part of intertemporal consumption smoothing or investment strategies.

As expected, total debt strongly and positively affects the financial burden. A 1 percent increase in outstanding debt increases the debt service-to-income ratio by approximately 0.12 percentage points. This elasticity highlights debt accumulation's mechanical and behavioral role in elevating financial pressure.

The structure and quality of debt also play significant roles. The debt concentration index—an inverse measure of debt diversification—shows a strong negative association with the financial burden. A one-unit increase in debt concentration is associated with a 0.39 percentage point increase in the burden ratio, indicating that households reliant on a narrow range of debt instruments or lenders face significantly higher financial stress, possibly due to limited negotiation power or access to less favorable loan terms.

TABLE 3

DETERMINANTS OF FINANCIAL BURDEN AND DEFAULT

	Model 1		Model 2		Model 3	
Financial Burden						
Total Income (ln)	-0.1420	***			-0.2953	***
Wealth (ln)	0.0323	***			0.0343	***
Debt (ln)	0.0667	***			0.1197	***
Debt Concentration Index (HH Index)	-0.3901	***			-0.3869	***
Debt Quality (%)	-0.0216	***			-0.1602	***
Constant	1.2271	***			2.5936	***
Default on Debt Payment						
Total Income (ln)			-0.1252	***	-0.1436	***
Wealth (ln)			-0.0400	***	-0.0679	***
Debt (ln)			0.1047	***	0.1033	***
Debt Concentration Index			-0.0503	***	-0.0696	***
Debt Quality (%)			-0.8114	***	-0.8418	***
Constant			0.2831	***	1.1089	***
Selection Variables						
Wealth (ln)	0.0485	***	0.1697	***	0.0134	***
Education (No education = 1)						
Basic Education	0.0856	***	0.2960	***	0.1696	***
Upper Secondary Education	0.0058	***	0.4359	***	-0.1615	***
Bachelor's degree or equivalent	-0.0277	***	0.6281	***	-0.3414	***
Postgraduate	-0.1447	***	0.6622	***	-0.5686	***

	Model 1		Model 2		Model 3	
Gender (Male = 1)	-0.0329	***	0.0624	***	-0.1967	***
Age groups (< 35 years = 1)						
35 to 44 years old	0.0199	***	0.1278	***	-0.1853	***
45 to 54 years old	-0.0229	***	0.0382	***	-0.1567	***
55 to 64 years old	0.0112	***	-0.0995	***	-0.0998	***
65 to 74 years old	0.0876	***	-0.1984	***	0.1935	***
75 years or more	0.0342	***	-0.5852	***	0.5118	***
Employment (Employed = 1)	0.0520	***	0.0851	***	0.6940	***
Urban (Urban = 1)	-0.1056	***	0.2327	***	-0.0718	***
Constant	-0.0263	***	-2.8905	***	1.1517	***
Selection Bias						
/lnsig_1	-0.1362	***			-0.1687	***
/atanhrho_11	3.0915	***				
/atanhrho_12					-0.0218	***
/atanhrho_13					2.0410	***
/atanhrho_22			0.2787	***		
/atanhrho_23					0.2387	***
Observations (N)	18,969,864		33,207,844		34,420,743	
Wald chi2	761,613.89		357,452.62		1,659,434.6	
Log pseudolikelihood	-24,000,000		-25,600,000		-31,055,113	
Prob > chi2	0.0000		0.0000		0.0000	

Note: (*), (**), (***) represent p-values less than 10%, 5%, and 1%, respectively.
Source: Authors' elaboration using data from the ENFIH (2019).

Finally, the share of high-quality (e.g., formal sector) debt is negatively associated with financial burden. A 1 percentage point increase in the share of high-quality debt is associated with a reduction of 0.16 percentage points in the debt burden, suggesting that access to credit under more favorable contractual conditions—typically characterized by lower interest rates and longer maturities—substantially alleviates repayment stress.

5.2. Probability of default

Models 2 and 3 estimate the latent propensity to default using a Heckprobit specification, where default is defined as more than three missed payments on any credit instrument. The results confirm the central role of income, wealth, and debt structure in predicting household financial distress. Table 3 shows the effects of the latent variable on the likelihood of defaulting, while Table 4 presents the marginal effects on the probability.

Household income and wealth are negatively related to the latent variable associated with the probability of default. A 1 percent increase in income reduces the likelihood of default by approximately 0.14 units, while a comparable increase in wealth reduces it by about 0.07 units. These results highlight the importance of economic resources in managing the debt service burden and enabling households to avoid delinquency altogether.

Total debt, by contrast, is a strong predictor of default risk. A 1 percent increase in debt is associated with a 0.10 unit increase in the latent propensity to default, reinforcing the idea that higher leverage (particularly in the absence of corresponding income growth) raises the risk of financial fragility.

Debt concentration is again positively associated with risk: households with more concentrated debt face higher default probabilities. The coefficient of –0.07 indicates that greater diversification of debt sources, such as borrowing across multiple institutions or instruments, is associated with better repayment outcomes.

Debt quality emerges as one of the most important predictors of default. A 1 percentage point increase in the share of high-quality debt reduces the probability of default by approximately 0.84 units, pointing to the protective effect of formal lending arrangements. This large effect emphasizes the critical role of the regulatory and institutional framework in shaping household financial outcomes.

To further interpret the Heckprobit models' results presented in Table 3, Table 4 reports the marginal effects of the key explanatory variables on the probability of default. These estimates quantify the change in the likelihood of default associated with a marginal change in each continuous variable, holding all other covariates at their means.

Across both Model 2 and Model 3, the marginal effects are statistically significant at the 1 percent level, and their signs and magnitudes are consistent with economic theory and the structural estimates previously discussed.

On the other hand, total household income exhibits a negative marginal effect on the probability of default. In Model 3, a 1 percent increase in the logarithm of income is associated with a 1.54 percentage point reduction in the likelihood of default. This result confirms that higher income gives households greater capacity to meet financial obligations, offering a buffer against unexpected expenses or income volatility.

Wealth also significantly reduces the probability of default. A 1 percent increase in wealth leads to a 1.33 percentage point decrease in default probability in Model 3. This larger magnitude (relative to income) suggests that asset holdings serve as a form of financial resilience through liquidation or collateral, thereby reducing the risk of defaulting.

Conversely, the level of outstanding debt is positively associated with default risk. In Model 3, a 1 percent increase in debt raises the probability of default by approximately 1.96 percentage points, highlighting the inherent risk associated with leverage accumulation. This elasticity underscores the importance of prudent credit limits, particularly for vulnerable borrowers.

Two structural features of household debt—concentration and quality—exert notable effects on repayment outcomes. The debt concentration index, which captures the extent to which a household relies on a single lender or credit product, is negatively related to default probability in Model 3. A unit increase in this index reduces the probability of default by 15.94 percentage points. While the magnitude appears high, it reflects a discrete shift in portfolio diversification: households with more fragmented borrowing structures may be better able to manage repayment through more flexible terms, staggered obligations, or differential enforcement across creditors. Alternatively, this could reflect more cautious borrowing behavior among households with access to multiple institutions.

Debt quality—measured as the percentage of debt held in formal, regulated institutions—is also a powerful determinant. In Model 3, a one percentage point increase in the share of high-quality debt reduces the probability of default by 1.48 percentage points. This result reinforces the role of institutional lending practices in supporting sustainable credit access. Formal sector debt is generally characterized by more favorable terms (e.g., lower interest rates, longer maturities, better dispute resolution mechanisms), which reduce repayment strain and default likelihood.

The marginal effects in Model 3 are broadly consistent with those from Model 2, although some coefficients differ in magnitude. For instance, the marginal effect of wealth nearly doubles from –0.0060 in Model 2 to –0.0133 in Model 3, suggesting that model specification and the inclusion of additional controls (or refinement of the selection correction terms) meaningfully affect the estimated impact of asset holdings on credit outcomes.

Overall, these marginal effects offer strong and policy-relevant evidence that household economic resources and debt structure are key levers for reducing the risk of default. In particular, improving access to high-quality, diversified, and affordable credit is a central avenue for enhancing household financial stability.

TABLE 4

MARGINAL EFFECTS OF DEFAULT ON DEBT PAYMENT

	Model 2 dy/dx		Model 3 dy/dx	
Total Income (ln)	-0.0186	***	-0.0154	***
Wealth (ln)	-0.0060	***	-0.0133	***
Debt (ln)	0.0156	***	0.0196	***
Debt Concentration Index	-0.0075	***	-0.1594	***
Debt Quality (%)	-0.1204	***	-0.0148	***

Note: (*), (**), (***) represent p-values less than 10%, 5%, and 1%, respectively.
Source: Authors' elaboration using data from the ENFIH (2019).

5.3. Credit access and sample selection

The selection equation identifies the determinants of credit access and enables correction for non-random sample inclusion. Socioeconomic characteristics, including wealth, education, gender, age, employment status, and urban residence, strongly influence access to credit.

Wealth increases the likelihood of credit access, with households possessing greater assets more likely to obtain loans, potentially due to their ability to provide collateral or signal financial stability. Educational attainment also exhibits a pronounced gradient: compared to individuals with no formal education, those with higher levels of schooling are substantially more likely to hold debt, with the effect peaking at the postgraduate level.

Employment status is a key determinant, as employed individuals are 0.69 units more likely to access credit. Similarly, households in urban areas are significantly more likely to be credit-active, reflecting better access to formal financial markets.

The pattern across age groups is nonlinear. Relative to younger adults (<35 years), individuals in the 35–64 age range show mixed coefficients, while those aged 65 or older appear more likely to hold debt, possibly due to accumulated financial history or access to retirement-linked credit products.

5.4. Model diagnostics and selection correction

The significant coefficients on the selection correction terms (/atanhrho_ij) support the presence of non-negligible correlation in the error structures across equations. In particular, the high positive correlation between the unobserved determinants of credit access and those of financial burden and default (e.g., /atanhrho_11 = 3.09; /atanhrho_13 = 2.04) confirms the importance of jointly estimating the system of equations. These findings validate the modeling approach and confirm that selection bias would have distorted the estimates had it not been corrected.

The model fit is strong, with Wald chi-squared statistics well above standard thresholds and log-pseudo-likelihood values consistent with the scale of the dataset, which includes over 34 million observations in the full sample.

This empirical evidence highlights the central role of income, wealth, and debt structure in shaping the level of financial stress households experience and their ability to avoid default. Crucially, it shows that debt quality and diversification can mitigate financial risk even for borrowers with modest incomes, pointing to important policy implications for credit regulation, financial inclusion, and consumer protection.

In terms of the correlation between each model's selection bias, the results showed that the sample presented a sample selection bias, which was corrected using the Heckman model. In both models, the factors that determine access to the debt market (selection equation) are household wealth, education, gender, age, employment status of the household head, and whether a household is in an urban or rural area.

The signs of these determinants are consistent with those reported by Costa (2012) and Piovarči (2021).

Finally, it is worth mentioning that using a mixed conditional process allowed us to jointly perform nonlinear models with correction for selection bias, showing an unobservable correlation between the financial burden and the probability of default. It is relevant to mention that, when estimating the models separately, the correlation of the unobservable variables is not considered, causing an underestimation of most of the parameters that explain the dependent variables. This finding serves as a starting point for future research by applying other methodologies that consider the simultaneity of these variables and the importance of defining the debt management strategies of household portfolios in México.

6. POLICY IMPLICATIONS

The results offer meaningful policy insights to strengthen Mexican households' financial sustainability and resilience. Strengthening household financial education leads to more responsible borrowing decisions, reducing the financial burden and the probability of default. The sensitivity of financial burden to debt and income levels changes suggests that households face significant budget constraints. Therefore, promoting increases in disposable income and asset accumulation becomes a priority, especially among the most vulnerable socioeconomic groups. This outcome can be achieved through programs that support formal employment and encourage savings policies.

Furthermore, higher debt quality and the concentration of credit in fewer instruments are associated with lower financial stress and a reduced risk of default. In this regard, it is advisable to promote access to formal, high-quality financial products, such as mortgages or personal loans with clear terms, competitive rates, and accessible repayment mechanisms. Debt restructuring initiatives may support households in consolidating their credit obligations, ease repayment burdens, and reduce the likelihood of over-indebtedness.

Finally, recognizing the significant simultaneous effect between financial burden and the probability of default implies that households do not face these issues in isolation, but rather as part of an interconnected financial process. Therefore, policy frameworks should incorporate structural determinants of credit access and repayment behavior to improve intervention efficacy. This perspective allows for more effective intervention by acknowledging household heterogeneity and the need to tailor strategies according to risk profile, income level, and type of debt held.

7. CONCLUSIONS

Efficient resource management through a financial system plays an essential role in the functioning of the market economy. In particular, access to the credit market boosts investment projects and risk diversification for individuals and households, improving quality of life and long-term economic well-being (Karlan and Zinman, 2011). Effective debt management is key to financial stability. The analysis identifies income, credit quality, and credit structure as key determinants of financial stress and default risk.

This research seeks to reduce the existing gap in the literature regarding the study of indebtedness and offers valuable implications for formulating public policies in México. The results show that income level, debt concentration, and debt quality are negatively related to Mexican households' financial burden and debt default. On the other hand, the debt level is positively associated with both dependent variables. Wealth shows different signs for each dependent variable, positively related to financial burden and negatively associated with default. The variables that determine access to the household debt market are wealth, education, gender, age, and employment status of the household head, as well as where the household is located. In addition, the study suggests that the financial burden and the probability of defaulting on debt present potential selection bias. Both variables are correlated through unobservable factors that determine this bias.

In addition to the limitation of relying on a single year of data (ENFIH 2019), several potential sources of bias should be considered. First, unobserved heterogeneity may affect the analysis, such as risk preferences, financial literacy, or informal support networks that influence credit access and repayment behavior. Second, informal credit channels (e.g., loans from family or pawnshops), only partially captured in ENFIH, may distort total indebtedness and repayment capacity measurements. Third, households' expectations about future income, interest rates, or credit availability are not observed and may influence borrowing and default decisions, introducing endogeneity. Fourth, the data may contain measurement errors in key variables such as income, wealth, and the classification of debt instruments.

Finally, given the cross-sectional nature of the data, the results cannot reflect dynamic effects, such as those emerging during macroeconomic disruptions (e.g., COVID-19). Future research would benefit from longitudinal data, more granular measures of informal finance, and methodologies that explicitly model expectations and heterogeneity across households.

Understanding the drivers of household financial burden and default enhances the evidence base for targeted interventions to strengthen financial resilience. The empirical evidence also supports the development of regulatory frameworks to improve credit outcomes and enhance the financial system's resilience. Furthermore, the findings indicate that credit cards and store-based credit represent significant channels of systematic and shared risk exposure for financial intermediaries.

Although temporally constrained to a single cross-section, this study offers a valuable basis for understanding the financial dynamics of Mexican households and highlights the importance of responsible debt management in personal financial planning and macroeconomic policy.

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ANNEXES

TABLE 5

IDENTIFICATION AND DEFINITION OF DEBT INSTRUMENTS

Type of debt instrument	Definition according to ENFIH 2019
Mortgage loan	Long-term loans (5 to 30 years) for the construction, purchase, expansion, or remodeling of real estate (house, apartment, or land) granted by banks, public institutions (INFONAVIT, FOVISSSTE), or other financial institutions.
Bank credit card	Financial products issued by banks or financial institutions serve as a means of payment in some establishments, with the characteristic that the amount spent is a loan that must be settled on established dates.
Departmental credit card	A financial product that operates under the same concept as the bank credit card, but the grantor or creditor is a commercial establishment whose use is exclusive to that establishment and its branches.
Payroll credit	Simple, fixed-amount credit can be obtained by an employee who receives his salary periodically through a deposit to his payroll account, where the guarantee is his salary, and the term can be from three to 60 months, with the automatic charge to the payroll account.
Personal Credit	It is a fixed-amount loan granted to an individual. It sometimes requires a guarantor, collateral, and/or promissory note, whose payment term can be established from three to 60 months (five years) and whose payments can be weekly, biweekly, or monthly.
Automobile credit	These are loans through which banks or agencies grant customers money to acquire cars and trucks. The financing period can range from six to 60 months, and the property's title remains as collateral.
Other credits	Includes other types of credits other than those mentioned above, such as: • Educational loans: These are loans to finance university tuition, master's degrees, study abroad, or doctorates. Their interest rates are generally lower than those of personal loans. • Informal Credit: These are loans made between individuals or between individuals and pawnshops, which, strictly speaking, are not financial institutions but instead service providers that provide money in exchange for collateral or joint and several guarantors. • Group Credit: Credit granted by some banks (Compartamos) or microfinance institutions to groups of three or six people, in some cases up to 20, in which the members know each other previously, are organized voluntarily, and have a group leader. The main guarantee is that they guarantee each other jointly and individually. • Others

Source: Authors' elaboration using the ENFIH 2019 glossary.

TABLE 6

DEBT CONCENTRATION INDEX: AN EXAMPLE

Household	Mortgage loan (ML)	Credit card (CC)	Personal/payroll credit (PPC)	Automobile credit (AC)	Other credits (OC)	Total Debt (TD)
598	311,198.00	30,000.00	0	162,620.00	22,000.00	525,818.00
605	0	0	9,000.00	0	0	9,000.00
Household	$S_1 = \left(\frac{ML}{TD}\right)^2$	$S_2 = \left(\frac{CC}{TD}\right)^2$	$S_3 = \left(\frac{PPC}{TD}\right)^2$	$S_4 = \left(\frac{AC}{TD}\right)^2$	$S_5 = \left(\frac{OC}{TD}\right)^2$	$DCI = \sum_{i=1}^{5} (s_i)^2$
598	0.3502	0.0033	0	0.0956	0.0018	0.4509
605	0	0	1	0	0	1

Source: Authors' elaboration with data from the ENFIH 2019.