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-RESEARCH ARTICLE-

HOW FINANCIAL LITERACY FACTORS INFLUENCE HOUSEHOLDS' INCOME AND EXPENSES

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─Abstract─

Financial literacy equips individuals with the knowledge and skills necessary to manage money effectively, thereby fostering financial well-being and supporting societal development through the promotion of financial responsibility. This study investigates the key determinants of financial literacy that influence household income and expenditure. The research employs an empirical analysis, utilising data from a biannual National Income and Expenses Survey. Two models were compared using multivariate estimations to examine the cause-and-effect relationships between income, expenditure, and financial literacy variables. The first model applied the least-squares method, while the second utilised a robust least-squares method, which accommodates outliers and mitigates the impact of assumption violations. Findings reveal that certain factors, including savings, education, medical expense insurance, life insurance, and credit card usage, significantly and positively influence household income and expenses over time.

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Notably, the acquisition of medical expense insurance, life insurance, and credit card usage emerged as the most impactful factors. Although savings and education were statistically significant, their overall influence on household financial outcomes was comparatively limited. This study contributes by identifying and highlighting the most influential factors affecting household income and expenditure, with implications for policy and practice. It is recommended to enhance financial literacy by improving public understanding and practical engagement with medical expense insurance, life insurance, and credit card usage, thereby promoting more sustainable and prosperous financial outcomes for households.

Keywords: Financial Literacy; Household Income; Household Expenses; Financial Behaviour; Medical Expenses Insurance; Life Insurance; Credit Cards

INTRODUCTION

Financial literacy is essential for both individuals and governments, as it provides the knowledge, attitudes, and behaviours required to optimise financial resources. This capability fosters economic growth by directing funds towards productive financial assets, thereby benefiting financial intermediaries and businesses (Mahdzan and Tabiani, 2013). Understanding the degree of familiarity that individuals and families have with financial concepts is particularly significant, given the virtuous cycle it creates, contributing to a more robust society and healthier economic dynamics. Moreover, it is crucial to examine how this knowledge can be translated into routine behaviours that reflect financial competence. Such behaviours indicate whether individuals or families are more likely to achieve wealth creation and are better prepared to manage crises and navigate economic uncertainties effectively. This study builds upon the conclusion drawn by Dwiastanti (2015), who asserted that "good financial literacy is necessary for every individual to manage her finances to achieve prosperity. To have a good level of financial literacy, individuals need to have smart financial behaviour to make them have the skills and confidence in using knowledge to be able to identify financial products and services." A prosperous financial life is thus not solely dependent on financial literacy but also necessitates the adoption of sound financial behaviours.

One of the earliest definitions of financial literacy was provided by Britain's National Foundation for Educational Research in 1992, describing it as "the ability to make informed judgments and to take effective decisions regarding the use and management of money" (Hogarth, 2002). Since then, the literature has expanded considerably, offering numerous studies that explore this construct, encompassing both its knowledge components and practical applicability. A more recent definition is presented by Yuesti et al. (2020), who regard financial literacy as "a basic need in the form of knowledge

and ability to manage personal finances, particularly to make accurate decisions in finance and to avoid financial problems." Notable and influential contributions include the work of (Lusardi & Mitchell, 2011a, 2011b), who focus their research on the relationship between financial literacy and decision-making in areas such as financial planning, retirement preparation, and the acquisition of financial products.

This study is deemed highly relevant, as financially illiterate individuals are at risk of making significant and often irreversible mistakes (Lusardi & Mitchell, 2011b). Consequently, the research identifies the most pertinent financial literacy factors influencing household income and expenditure. The findings have practical implications for a broad range of stakeholders, including families, financial institutions, academia, government, and policymakers, as they provide an opportunity to determine which factors warrant investment to enhance financial stability and resilience. Furthermore, the regional analysis presented in the study enables the development of targeted strategies to improve financial literacy, tailored to the specific conditions and needs of households.

A substantial body of research has been dedicated to financial literacy, with the majority emphasising its importance and its impact on both society and the economy. These studies often highlight elements associated with achieving greater wealth, improved retirement planning, and the key components that contribute to the development of financial literacy. However, there remains a notable gap in the literature concerning analyses that examine the most prevalent factors influencing financial literacy collectively and identify those that are most significant in affecting household income and expenditure.

The benefits from this study, at first hand, would be individuals and families who might reach a more prosperous life by making better decisions regarding their finances. Also, financial institutions might find it valuable, because they will have an opportunity to offer more accurate services to their customers, whether at national or regional level. This topic would be also relevant for the academic field and other researchers who want to expand their understanding of the dynamic of individual factors of financial literacy and their impact on the welfare of people. Lastly, the study would be a useful tool for policy makers and the government willing to find better paths for helping society.

The remainder of this paper is structured as follows. First, a literature review is presented, detailing the definitions and significance of financial literacy, alongside empirical studies conducted by researchers in various contexts. This section also examines key factors related to financial literacy, including education, financial behaviour, planning, investing, and savings. Subsequently, the methodology is outlined, comprising an empirical analysis that compares two multivariate estimation models to investigate the cause-and-effect relationships between income, expenditure, and

financial literacy variables. The following section presents the results and discussion. Finally, the paper concludes by identifying the most significant financial factors that support household income and expenditure.

LITERATURE REVIEW

Financial literacy is integral to societal development, as financially informed individuals are better positioned to manage their financial affairs responsibly (Mahdzan and Tabiani, 2013). Despite its importance, financial literacy does not have a universally accepted definition, with interpretations varying across studies. In 1992, Britain's National Foundation for Educational Research defined financial literacy as "the ability to make informed judgments and to take effective decisions regarding the use and management of money" (Hogarth, 2002). Since then, numerous definitions have been proposed, incorporating similar concepts but with subtle variations in emphasis and scope.

In general, these definitions encompass both theoretical knowledge and practical application in decision-making. For instance, Yuesti et al. (2020) define financial literacy as "a basic need in the form of knowledge and ability to manage personal finances, particularly to make accurate decisions in finance and to avoid financial problems". Similarly, other scholars suggest that financial literacy involves an understanding of financial and risk-related concepts, combined with the capability to utilise this knowledge for making informed decisions about money management (Gunawan et al., 2021). Graña-Alvarez et al. (2024) describe it as "an individual's understanding of key financial terms and the application of this knowledge to manage his or her finances". Finally, Khalisharani et al. (2022) define financial literacy as "knowing and understanding matters that support financial decision-making."

In addition to analysing definitions of financial literacy, it is also relevant to identify its importance because people with stronger financial knowledge are linked to better financial behaviour and are more likely to buy equities and invest more efficiently, which might lead to important lifetime consequences (Lusardi & Mitchell, 2011a). As stated by Lusardi and Mitchell (2011b), "financial literacy is strongly and positively associated with planning, and the results are statistically significant at conventional levels". Empirical studies have measured the immersion in financial literacy in different countries, contexts, and groups to determine the level of financial literacy in society regarding awareness of concepts, level of savings, behaviour toward personal finance, the use of credit cards, and self-control attitudes.

In relation to awareness of financial concepts, Lusardi and Mitchell (2011a) conducted a biannual survey in the United States starting in 1992 to assess financial literacy. The findings revealed that only 66% of respondents understood the concept of compound

interest, three-quarters correctly answered questions about inflation, 50% recognised that holding a single company stock was riskier than owning a mutual fund, and only 34% of respondents answered correctly on all three topics. In relation to savings, a survey conducted with approximately 200 participants in Malaysia found that higher levels of financial literacy were associated with higher levels of individual savings (Mahdzan and Tabiani, 2013). Regarding behaviour towards personal finance, another study involving 4,000 students from six public and six private universities in Ghana revealed that individuals with greater financial knowledge were more likely to exhibit stronger financial behaviour (Mireku et al., 2023).

Finally, studies have also explored the use of credit cards and self-control. Dwiastanti (2015) conducted a survey in Indonesia, which revealed that only approximately 21% of individuals understood financial concepts and the use of credit cards. The study concluded that a lack of knowledge regarding compound interest was a primary cause of poor credit management (Dwiastanti, 2015). In another study involving UK households with over 3,000 participants, it was found that a lack of self-control might be linked to high levels of credit card utilisation. Additionally, high levels of impatience were associated with increased credit card usage (Gathergood, 2012). The research also found that over-indebtedness is more likely when individuals experience problems with self-control.

The following three subsections focus on the key factors highlighted in the literature review: (a) education, (b) financial behaviour, and (c) planning, investments, and savings. For the purposes of this study, the authors were also interested in examining financial literacy in relation to micro-, small-, and medium-sized enterprises; thus, an additional subsection addressing this aspect has been included.

Education

Some researchers argue that financial literacy can be enhanced through the implementation of financial education programmes. For instance, Ibarra López and Tapia Cortés (2022) found that the variables most predictive of insurance ownership—one of the factors associated with financial strength—are income and education level. Similarly, Mahdzan and Tabiani (2013) noted that individuals with lower levels of financial literacy tend to face higher interest rates, while other scholars (Dwiastanti, 2015; Yuesti et al., 2020) suggest that financial literacy should be taught from childhood. Rodriguez (2016) partially supports this notion, acknowledging that teaching financial literacy at an early age may not be the complete solution. The findings of this study indicated that higher levels of financial education did not necessarily lead to an increase in retirement savings, another key aspect of financial literacy. In a similar vein, Lusardi and Mitchell (2011b) argued that "education is not a good proxy for financial literacy". There is a gap regarding the relationship between

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education and financial literacy that will be explored in this study. Even if education might help to modify the level of financial literacy, on a different front, presented by (Gathergood, 2012), it was stated that the level of financial literacy would not influence self-control, which would lead to over indebtedness. Therefore, this study pertains to analyse not only the level of knowledge in financial literacy, but also financial behaviour.

Financial Behaviour

According to Khalisharani et al. (2022), financial behaviour refers to actions associated with money management. Yuesti et al. (2020) emphasised that achieving a prosperous financial life is not solely dependent on financial literacy, but also on sound financial behaviour. The authors reviewed in this study agree that financial literacy is positively correlated with financial behaviour (Dwiastanti, 2015), has a positive impact on managing personal finances, and is positively associated with wealth accumulation (Graña-Alvarez et al., 2024). Financial knowledge exerts a significant influence on financial management behaviour, including savings, shopping, and both long- and short-term planning, with financial literacy being positively associated with saving, spending, and planning (Gunawan et al., 2021). Responsible financial behaviour encompasses activities such as investing, saving money, and repaying debt over time (Dwiastanti, 2015).

Planning, Investments, and Savings

According to the authors reviewed, financial literacy has a positive impact on an individual's future, planning, and retirement (Mahdzan and Tabiani, 2013). Individuals with higher levels of education, particularly in finance, are more likely to engage in financial planning and succeed by relying on formal methods and financial experts rather than seeking advice from relatives or friends. Conversely, poor financial planning is often linked to financial illiteracy (Lusardi & Mitchell, 2011a). In their study, Lusardi and Mitchell (2011a) found that 33% of older Americans lacked a retirement savings plan, and they highlighted that those who plan for retirement accumulate three times more wealth than those without a plan. Researchers have established a strong correlation between financial literacy, retirement planning, and wealth accumulation for retirement (Lusardi & Mitchell, 2011b). Financial difficulties are not solely caused by poor credit management but are often the result of inadequate financial planning (Yuesti et al., 2020). Financial knowledge and a culture of saving are crucial elements in ensuring financial stability (Yakob et al., 2021). Strengthening financial literacy and promoting savings should also be a priority for governments, as "individual savings benefit the entire nation. Savings have a positive impact on the economy because funds placed in financial assets are channelled through financial intermediaries to fund firms' investments. Subsequently, firms' investments ultimately benefit nations through

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higher productivity and economic growth. Furthermore, high savings can also shield countries against economic downturns and financial crises" (Mahdzan and Tabiani, 2013, p. 42).

Small and Medium Enterprises (SMEs)

Finally, this study focuses on the analysis of the literature regarding the relationship between financial literacy and small and medium-sized enterprises (SMEs). The interest in this area stems from the fact that these firms contribute more than 60% of GDP, account for over 70% of employment, and make up more than 95% of organisations in many countries globally (Ahmadi et al., 2021; Alvarado Lagunas et al., 2018; Kassa, 2021). Many of these enterprises are family-owned and operated, making an understanding of their financial literacy particularly relevant, as it may influence the financial behaviour of the firm. According to Yakob et al. (2021), "the lack of financial literacy and/or resources to manage financial matters were among the top 10 challenges faced by financial institutions in providing financing to SMEs".

Graña-Alvarez et al. (2024) reviewed 71 articles on financial literacy and SMEs, finding a positive impact on areas such as planning (budgeting), savings, and investments. For instance, two studies conducted in Southeast Asia provide further insights. The first study, which surveyed 200 SME owners in Malaysia, evaluated financial management, savings, debt, investment, and insurance concepts. The findings indicated a positive and significant impact of financial literacy on the performance of SMEs (Yakob et al., 2021). The second study, focused on SMEs in Indonesia, revealed that financial literacy has a significant and direct effect on rational financing decisions. Additionally, this research found that financial literacy positively influences a firm's financial performance (Sohilauw et al., 2020). This study aims to identify the most relevant factors of financial literacy that have impacted Mexican households' income and expenses during the 2016-2022 period. The hypothesis is:

H1: *Households with better financial behaviour, have higher levels of income and expenses.*

According to the literature review, the concepts included as better financial behaviour are owning pension plans, owning a business, and having medical expense insurance, having life insurance, owning credit cards, reporting monthly savings, receiving other financial income, and having higher levels of education. The novelty of this study is the identification, from the many factors reviewed at the literature, of the main ones that influence income and expenses in a regular household.

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METHODS

Data and Empirical Analysis

An empirical analysis was conducted using data from the National Income and Expenses Survey (ENIGH, from its Spanish acronym) in Mexico for the years 2016, 2018, 2020, and 2022. This biannual national survey is carried out by the National Institute of Statistics and Geography (INEGI, from its Spanish acronym) and provides statistical representation of income and expenses for Mexican households, including details on amounts, sources, and distributions. Additionally, the survey encompasses variables related to housing infrastructure, equipment, sociodemographic information, and detailed data on economic activities (INEGI, 2023). Table 1 presents the selected variables in which financial literacy was applied to Mexican households, based on the key factors identified in the literature review.

Table 1: Variables Selected to Measure Financial Literacy.

Variable	Description	Units
Savings	Monthly savings in a savings account	MXN Pesos
Pension Plan	Pension fund account	MXN Pesos
Education	Education level of the household head	11-Levels Variable
Own Business	Ownership of a micro, small or medium business	Binary Variable
Financial Income	Monthly income from financial investments	MXN Pesos
Medical Expenses Insurance	Having a medical expenses insurance	Binary Variable
Life Insurance	Having a life insurance	Binary Variable
Credit Card	Use of credit card	Binary Variable

Source: Authors' Own Work

Additionally, the same methodology employed by the National Council for the Evaluation of Social Development Policy was utilised to estimate the net monthly income and household expenses (Consejo Nacional de Evaluación de la Política de Desarrollo Social, 2009). The empirical analysis involved a comparison between two models, using multivariate estimations to test the cause-and-effect relationships between income/expense and financial literacy variables. Firstly, the least-squares method (Model I) was applied, with the following equation:

$$\text{Income/Expense}_i = \beta_0 + \beta_1 \text{Financial}_i + u_i, \qquad (1)$$

Where β_0 and β_1 capture the response of the income and expense variables to an impulse from the financial literacy variables, respectively, and u_i represents the error term. The subscript i denotes all subjects in the cross-sectional model for each biannual dataset. Secondly, the robust least squares method (Model II) was employed, which accommodates reactions that are less sensitive to outliers and violations of assumptions,

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following the set of equations:

$$\text{Income/Expense}_i = \beta_0 + \beta_1 \text{Financial}_i + u_i, \quad (2)$$

$$\beta_1 = \arg\min \sum_{i=1}^{n} {u_i}^2. \quad (3)$$

These econometric techniques have been extensively employed to analyse the effects of the financial system throughout an economy. Empirical studies conducted in Europe on this matter demonstrate significant impacts on both companies and households, as seen in the work of (Kosmidou et al., 2007; Pasiouras & Kosmidou, 2007). Regarding studies of the US banking system, research by (Bhuyan & Williams, 2006; DeYoung & Rice, 2004; Hirtle & Stiroh, 2007) has shown that financial instruments contribute to an increase in consumption expenses. When analysing countries in To and Tripe (2002), and Williams (2003) found that the banking system acts as an economic promoter on the income side. All the aforementioned empirical studies, along with several others, have utilised least squares (LS) techniques, which have proven to meet the necessary statistical properties. (Antoniadis & Fan, 2001; Tibshirani, 1996) have emphasised the advantages of employing LS estimations. In particular, contrasting LS models when estimating causal effects is recommended by (Fan & Tang, 2013; Kennedy, 2008; Zhang, 2010). For the present empirical study, contrasting estimations between Model I and Model II follow the methodological approach of the surveyed studies and are pertinent to the Mexican banking system. The analysis was conducted in two stages. Firstly, the impacts of financial literacy variables on income and expenses were identified at the national level. Secondly, the data was disaggregated for a regional analysis. The Mexican states were categorised into four regions according to the classification previously used by INEGI (INEGI, 2016): Centre, Centre-West, North, and Southeast.

RESULTS

At the national level, several variables were found to be significant in influencing either the income or expenses of Mexican households across Models I and II. In particular, savings, education, medical expense insurance, life insurance, and credit cards exhibited positive effects. These variables demonstrated a consistent relationship with the dependent variables over time, while the remaining variables typically exhibited ambiguous behaviour or were not significant. In relation to the estimations for 2016, the results confirmed the same direction of impacts as previously stated; specifically, financial income showed a modest effect on both income and expenses (see Table 2).

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Table 2: Income and Expense Models for 2016.

Dependent Variable	**Income**		**Expenses**	
Independent Variables	MODEL 1	MODEL II	MODEL 1	MODEL II
Savings	1.14 (0.04)***	1.76 (0.00)***	0.11 (0.00)***	0.44 (0.00)***
Pension Plan	NS	1479.40 (39.02)***	1065.52 (137.50)***	779.47 (0.00)***
Education	1289.61 (85.32)***	702.57 (3.27)***	850.55 (11.55)***	544.60 (2.24)***
Own Business	1198.75 (617.44)**	NS	432.38 (83.57)***	120.32 (16.24)***
Financial Income	0.15 (0.04)***	0.09 (0.00)***	0.24 (0.00)***	0.063 (0.00)***
Medical Expenses Insurance	24548.90 (1884.86)***	7297.71 (72.40)***	11536.49 (255.13)***	4820.30 (49.59)***
Life Insurance	4213.00 (1045.44)***	3131.13 (40.16)***	3651.50 (141.51)***	1822.84 (27.50)***
Credit Card	6776.97 (490.10)***	3350.38 (179.66)***	4144.99 (66.34)***	2403.70 (12.89)***
Adjusted R^2	0.0251	0.1599	0.2613	0.166
Observations	70,311	70,311	70,311	70,311

Source: Authors' Own Work
Notes: *** significance <0.01; ** significance <0.05; *significance <0.10. n.s. = not significant.

When analysing the 2018 data, the cause-and-effect relationships between the variables remained consistent. Once again, there was a small impact on income and expenses resulting from increases in financial income. Similarly, the effect of savings was observed, while the impact of owning a business was not consistent across models, as it showed a decrease. This suggests that a key variable cannot solely explain income or expenses (see Table 3).

Table 3: Income and Expense Models for 2018.

Dependent Variable	**Income**		**Expenses**	
Independent variables	MODEL 1	MODEL II	MODEL 1	MODEL II
Savings	1.32 (0.00)***	1.76 (0.00)***	0.33 (0.004)***	0.39 (0.00)***
Pension Plan	NS	1331.03 (58.99)***	718.16 (154.96)***	819.65 (41.76)***
Education	1206.10 (25.21)***	802.57 (4.664)***	950.55 (12.25)***	640.14 (3.302)***
Own Business	360.61 (182.93)**	-275.38 (33.84)***	209.06 (88.89)**	52.46 (23.96)**
Financial income	0.037 (0.00)***	0.09 (0.00)***	0.035 (0.00)***	0.75 (0.00)***

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Table 3: Income and Expense Models for 2018. (Continued)

Dependent Variable	Income		Expenses	
Medical expenses insurance	21019.49 (594.98)***	5400.12 (110.07)***	11367.12 (289.13)***	4276.77 (77.93)***
Life insurance	6352.67 (323.56)***	3552.89 (59.86)***	3917.80 (157.23)***	2283.17 (42.38)***
Credit Card	6288.94 (147.18)***	3715.43 (27.23)***	4569.91 (71.52)***	2671.96 (19.27)***
Adjusted R^2	0.2992	0.1787	0.2787	0.1688
Observations	74,647	74,647	74,647	74,647

Source: Authors' own work
Notes: *** significance <0.01; ** significance <0.05; *significance <0.10. n.s. = not significant.

However, the results for 2020 differ significantly. Official data contain a considerable amount of repeated entries throughout the database, leading to non-significant relationships among all variables when Model II is applied (see Table 4). As a result, it is only feasible to analyse the effects using Model I, where financial income demonstrates a very small impact.

Table 4: Income and Expense Models for 2020.

Dependent Variable	Income		Expenses	
Independent variables:	MODEL 1	MODEL II	MODEL 1	MODEL II
Savings	0.50 (0.00)***	1.56	0.036 (0.001)***	0.27
Pension Plan	NS	1480.08	614.81 (144.56)***	864.10
Education	1085.17 (27.86)***	732.75	728.32 (10.20)***	494.57
Own Business	693.08 (190.04)***	-231.63	447.05 (69.63)***	220.37
Financial Income	0.02 (0.00)**	-0.004	0.12 (0.002)***	0.39
Medical Expenses Insurance	18133.97 (636.07)***	5860.34	9806.37 (233.06)***	3151.27
Life Insurance	6444.83 (370.70)***	3468.46	4016.66 (135.83)***	2071.23
Credit Card	6739.97 (158.54)***	3673.54	4196.98 (58.09)***	2635.09
Adjusted R^2	0.2637	0.194	0.2249	0.1486
Observations	89,549	89,549	89,549	89,549

Source: Authors' Own Work
Notes: *** significance <0.01; ** significance <0.05; *significance <0.10. n.s. = not significant.

The results for the modelling of 2022 were different than expected. As Table 5 shows, owning a business is not related to income or expenses, and financial income has a

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smaller impact than in the previous years. Thus, there is a clear negative effect of the pandemic on the way micro, small, and medium businesses were a solution for income and expense levels for households. If the entire analysed period is considered, it is evident that increases in savings, education, medical, and life insurance will increase household income and expenses in Mexico. The other variables exhibited different performances over time. For example, a pension plan is not statistically significant when Model I is analysed for income during 2016-2020 period; nonetheless, it is relevant for household income only for 2022. However, Model II shows that the same variable is significant for income in all the years. Among these variables, owning medical expense insurance had the most significant effect on both income and expenses. As shown in Table 5, when analysing Model II for 2022, having this type of insurance would increase households' income by $6,494.76 pesos. This can be interpreted as the amount of resources an insurance holder would save in comparison to the expenses incurred when facing a medical emergency, in the absence of insurance.

Table 5: Income and Expense Models for 2022.

Dependent Variable	**Income**		**Expenses**	
Independent Variables	MODEL 1	MODEL II	MODEL 1	MODEL II
Savings	0.36 (0.01)***	0.97 (0.01)***	0.26 (0.01)***	0.26 (0.00)***
Pension Plan	6994.62 (1238.48)***	3204.95 (743.91)***	4341.03 (974.26)***	2961.15 (590.45)***
Education	1126.26 (93.57)***	940.74 (56.20)***	1201.78 (73.56)***	855.62 (44.58)***
Own Business	NS	NS	NS	NS
Financial Income	0.01 (0.00)*	-0.08 (0.00)***	0.03 (0.00)***	0.21 (0.00)***
Medical Expenses Insurance	16589.75 (1741.79)***	6494.76 (1046.23)***	14659.61 (1370.22)***	5647.62 (830.42)***
Life Insurance	5701.42 (1017.19)***	4496.37 (610.99)***	4837.65 (800.13)***	3397.42 (484.92)***
Credit Card	-7732.43 (507.51)***	-5551.03 (304.84)***	-6237.28 (399.06)***	-4468.62 (241.85)***
Adjusted R2	0.2526	0.1678	0.2956	0.1943
Observations	90,096	90,096	90,096	90,096

Source: Authors' own work
Notes: *** significance <0.01; ** significance <0.05; *significance <0.10. n.s. = not significant.

As previously mentioned, a variable that exhibits variations across years is financial income, which had a small but positive impact on both income and expenses in 2016 and 2018. However, from 2020 onwards, this variable began to show a negative impact on income. Another notable change occurred with credit card holders. Between 2016 and 2020, households reporting the use of credit cards experienced a positive impact on their income (due to the availability of a credit line) and expenses (due to the resources

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available and ready to spend). However, in 2022, both household income and expenses were negatively affected by this variable in Models I and II. Finally, the variable of owning a business or an SME presents significant findings. Based on the results of Model I, owning a business had a positive and statistically significant impact on both the income and expenses of Mexican households throughout the entire period. Specifically, owning an SME contributed to higher income while simultaneously increasing the household's capacity to spend. However, data from the 2022 survey reveals that the impact of SMEs on household income is no longer significant. In terms of Model II results, the effect was non-significant in both 2016 and 2022, while it was negative for 2018 and 2020. Regarding expenses, both models indicated a positive and significant impact for the 2016-2020 period. Nevertheless, in 2022, the relationship became non-statistically significant in both models.

Income at a Regional Level

The same methodology was replicated by adhering to the INEGI (2016) regional classifications in Mexico: Centre (C), Centre-West (CW), North (N), and Southeast (SE). Table 6 illustrates the regional dynamics of income, where the variables of education and credit card usage positively influence monthly household income. Although the magnitude of these effects varied across regions, a direct relationship remained consistent over time. The Southeast region exhibited the lowest impact on income from credit card usage between 2016 and 2020. In 2022, however, the Central region showed the lowest impact. The same methodology was replicated by adhering to the INEGI (2023) regional classifications in Mexico: Centre (C), Centre-West (CW), North (N), and Southeast (SE). Table 6 illustrates the regional dynamics of income, where the variables of education and credit card usage positively influence monthly household income. Although the magnitude of these effects varied across regions, a direct relationship remained consistent over time. The Southeast region exhibited the lowest impact on income from credit card usage between 2016 and 2020. In 2022, however, the Central region showed the lowest impact.

Regarding the impact on monthly income due to financial investments, both models indicate that all regions experienced a positive, albeit small, impact during 2016 and 2018. However, by 2020, the cause-and-effect relationship turned negative in all regions, except for the Centre-West, where this variable was found to be non-significant. In 2022, the impact remained negative across all regions, except for the Northern region, where it was not significant. In all instances, the relative magnitude of the impact, as measured by the coefficients, was small. Nevertheless, in the Southeast region, one of the least developed regions in the country, the impact was more pronounced, showing the highest values for 2016 and 2018. Finally, when considering the results from Model II, ownership of an SME positively affects household income, particularly in the Northern region from 2016 to 2020. However, by 2022, this impact is no longer statistically significant in this region.

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Table 6: Impact of Financial Literacy Variables on Household's Income by Region (Part 1).

Income		2016		2018		2020		2022	
Variable	**Region**	**Model 1**	**Model 2**	**Model 1**	**Model 2**	**Model 1**	**Model 2**	**Model 1**	**Model 2**
Savings	**SE**	1.27 (0.02) ***	1.7916 (0.011)	NS	1.97 (0.01)***	0.85 (0.01)***	1.75 (0.00)***	0.179 (0.02)***	0.26 (0.01)***
	N	1.33 (0.13)***	1.7391 (0.01)	1.26 (0.015)***	1.50 (0.00)***	0.45 (0.00)***	1.34 (0.00)***	0.51 (0.04)***	0.74 (0.02)***
	CW	1.31 (0.04)***	1.8417 (0.0188)	1.45 (0.02)***	1.71 (0.00)***	0.91 (0.00)***	1.55 (0.00)***	0.30 (0.04)***	0.95 (0.02)***
	C	0.99 (0.05) ***	1.8021 (0.005)	1.51 (0.02)***	1.79 (0.01)***	1.12 (0.01)***	1.69 (0.00)***	0.52 (0.05)***	0.89 (0.04)***
Pension plan	**SE**	2335.79 (538.63) ***	1706.25 (228.08)	1.45 (0.02)***	1532.36 (299.49)***	1056.01 (537.91)**	1635.70 (304.61)***	NS	NS
	N	NS	1063.755 (175.48)	NS	602.59 (214.08)***	NS	1314.16 (218.00)***	15143 (3062.67)***	4071.85 (1844.93)**
	CW	1870.13 (567.62)***	991.26 (249.06)	1481.54 (541.98)***	1821.15 (226.75)***	NS	859.42 (259.41)***	3998.08 (2041.11)*	5176.84 (1291.12)***
	C	NS	1634.803 (249.65)	NS	1134.18 (281.31)***	NS	NS	3893.99 (1866.97)**	3778.99 (1293.33)**
Education	**SE**	1057.70 (48.42) ***	670.04 (20.50)	1130.51 (42.86)***	728.19 (22.50)***	1104.54 (34.39)***	676.63 (19.47)***	1350.05 (166.61)***	990.84 (111.71)***
	N	1777.21 (228.92) ***	809.460 (17.66)	1353.73 (58.52)***	963.24 (19.00)***	1166.25 (74.05)***	876.27 (18.86)***	1159.21 (272.85)***	990.28 (164.36)***
	CW	1184.85 (40.00) ***	720.70 (17.55)	1278.06 (43.80)***	805.98 (18.32)***	1070.11 (35.12)***	728.91 (17.04)***	1315.81 (158.85)***	1086.33 (100.48)***
	C	863.85 (157.21)***	558.021 (15.95)	900.06 (37.26)***	641.77 (17.98)***	800.90 (33.02)***	598.94 (16.88)***	769.62 (130.04)***	782.59 (90.08)***
Own Business	**SE**	1281.30 (324.34) ***	NS	-491.43 (277.23) *	-575.52 (145.54)***	-394.76 (208.74)*	-502.16 (118.21)***	NS	NS
	N	NS	1661.005 (175.89)	3746.36 (627.88)***	1425.98 (203.87)***	3174.85 (738.93)***	1786.03 (188.25)***	NS	NS
	CW	1121.13 (283.79)***	NS	769.04 (321.18)**	NS	1733.15 (231.76)***	270.48 (112.44)**	2332.73 (1082.79)**	1551.75 (684.93)**
	C	NS	NS	NS	-302.41	948.37	NS	NS	NS

					(107.92)***	(194.75)***			
Financial Income	**SE**	0.29 (0.02) ***	0.27 (0.00) ***	-0.02 (0.00)***	0.15 (0.00)***	-0.16 (0.01)***	-0.038 (0.00)***	NS	-0.02 (0.00)***
	N	0.16 (0.09) *	0.14 (0.007)***	0.03 (0.02)*	0.04 (0.00)***	0.22 (0.02)***	-0.01 (0.00)***	NS	NS
	CW	0.08 (0.02)***	0.06 (0.00)***	NS	0.09 (0.00)***	-0.11 (0.00)***	NS	0.12 (0.05)**	-0.11 (0.03)***
	C	NS	0.07 (0.00)***	0.04 (0.00)***	0.047 (0.00)***	NS	-0.05 (0.00)***	-0.11 (0.04)**	-0.54 (0.03)***
Medical Expenses Insurance	**SE**	9965.19 (1037.02) ***	4958.94 (439.12) ***	20823 (1073.55)***	5788.28 (563.60)***	13883.18 (799.46)***	6748.36 (452.72)***	19879.96 (3146.16)***	NS
	N	20528.25 (4271.34) ***	9864.46 (329.63)***	24626.18 (1214.19)***	5302.26 (394.30)***	23796.05 (1424.85)***	5629.67 (363.01)***	28874 (4380.73)***	20279.63 (2638.92)***
	CW	15624.17 (987.08) ***	7264.20 (433.12)***	16854.36 (1021.66)***	5508.53 (427.45)***	12508.37 (862.59)***	5016.75 (418.51)***	10629.83 (3057.57)***	13683.31 (1934.09)***
	C	69291.70 (4541.55) ***	4957.20 (460.84)***	16412.72 (1094.12)***	5658.26 (528.07)***	9636.51 (970.92)***	6945.76 (496.61)***	NS	3921.30 (1844.99)**
Life Insurance	**SE**	5164.95 (553.28) ***	2971.75 (234.28)***	4635.83 (512.26) ***	3546.12 (268.93)***	6328.44 (424.54)***	4089.87 (240.41)***	5669.13 (1748.36)**	5377.82 (1172.25)***
	N	NS	3092.84 (200.21)***	6001.80 (317.55)***	3906.83 (229.62)***	7288.30 (931.15)***	3730.65 (237.23)***	NS	6039.43 (1475.37)***
	CW	4588.93 (501.77)***	3274.50 (220.17)***	7774.32 (597.00)***	3297.01 (249.77)***	4981.49 (480.74)***	3318.10 (233.24)***	5957.16 (1866.12)***	4222.49 (1180.43)***
	C	NS	2726.78 (234.43)***	5970.87 (521.32)***	3399.60 (251.61)***	5331.47 (503.39)***	2811.82 (257.47)***	7885.85 (1667.71)***	4493.90 (1155.29)***
Credit Card	**SE**	5468.33 (268.15) ***	3116.43 (113.55)***	5022.86 (239.34)***	3247.09 (125.65)***	5136.21 (193.39)***	3059.56 (109.51)***	8059.41 (894.41)***	6582.09 (599.69)***
	N	7185.75 (1233.51)***	3071.77 (95.19)***	6001.80 (317.55)***	3613.69 (103.11)***	6918.64 (396.19)***	3580.64 (100.93)***	7914.65 (1329.95)***	5963.51 (801.15)***
	CW	6195.83 (237.90) ***	3564.97 (104.38)***	7110.98 (270.26)***	4022.14 (113.07)***	6652.91 (207.82)***	3981.45 (100.83)***	7745.56 (897.57)***	4817.86 (567.76)***
	C	7214.38 (1006.72) ***	3266.62 (102.15)***	6315.25 (243.04)***	3649.004 (117.30)***	5621.38 (202.78)***	3555.08 (103.72)***	5217.75 (769.60)***	4699.60 (533.13)***

Source: Authors' Own Work

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The Northern region includes key business cities such as Monterrey, Nuevo León, and other areas near the US border. In contrast, in the Southeast region, which encompasses states like Chiapas, Veracruz, and Tabasco, known for high inequality indicators, business ownership did not only fail to positively affect income, but also had a negative impact in 2018 and 2020. This variable was not significant in this region in 2016 or 2022. The Central region, which includes the country's capital, also comprises states with high levels of inequality, such as Guerrero, Hidalgo, and Puebla. In this region, owning an SME was not statistically significant for income, with the only exception being 2020, where the impact was significant but negative. The Center-West region exhibited no significant impacts, particularly in 2016 and 2018. However, in 2020 and 2022, the impact became positive. Notably, this is the only region in Mexico where SME ownership was found to increase household income.

Expenses at a Regional Level

In the developed models, where the dependent variable was monthly household expenses, only education maintained its positive impact on expenses across all four periods analysed. The other four variables—monthly savings amount, medical expense insurance, life insurance, and credit card usage—were consistently positively relevant throughout the 2016-2020 period. However, in 2022, changes were observed in some regions regarding the impact of these variables.

1) In the Southeast region, savings accounts did not represent a significant variable.
2) In the Central region, medical expense insurance coverage became statistically insignificant.
3) In the Centre-West region, having a life insurance policy was not found to be a relevant variable.

Credit card ownership was the only variable that remained positively related to household expenses throughout the study period. The Southeast region exhibited the lowest impact, with the exception of 2016. Households with pension plans experienced higher monthly expenses, with the exception of the Centre region in 2020, where this variable was not statistically significant. The amount of monthly income derived from financial investments had a positive impact on monthly expenses, except in the Southeast region, where it exhibited a negative impact in 2018 and 2022. The final variable analysed was SME ownership. Similar to the results of the income-based model, when considering expenses, ownership of a small business had no significant impact on the behaviour of households in any region of Mexico in 2022. This represented a notable change compared to the previous survey (2020), where all regions exhibited positive and significant impacts. In 2018, only the Northern and Centre-West regions showed a positive and significant relationship between business ownership and expenses. Table 7 presents the regional expense dynamics.

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Table 7: Impact of Financial Literacy Variables on Household's Expenses by Region (Part 1).

Expenses		2016		2018		2020		2022	
Variable	**Region**	**Model 1**	**Model 2**	**Model 1**	**Model 2**	**Model 1**	**Model 2**	**Model 1**	**Model 2**
Savings	**SE**	0.11 (0.01)***	0.46 (0.00)***	0.30 (0.01)***	0.49 (0.00)***	0.10 (0.00)***	0.26 (0.05)***	5339.48 (2143.95)**	NS
	N	0.18 (0.01)***	0.40 (0.00)***	0.32 (0.00)***	0.33 (0.00)***	0.02 (0.00)***	0.30 (0.00)***	NS	0.08 (0.01)***
	CW	0.38 (0.02)***	0.45 (0.01)***	0.35 (0.01)***	0.35 (0.00)***	0.10 (0.00)***	0.24 (0.00)***	0.40 (0.03)***	0.21 (0.02)***
	C	0.03 (0.00)***	0.46 (0.00)***	0.27 (0.01)***	0.50 (0.00)***	0.17 (0.01)***	0.28 (0.00)***	0.41 (0.04)***	0.26 (0.03)***
Pension Plan	**SE**	1978.66 (285.53)***	987.33 (158.88)***	NS	889.49 (215.62)***	610.84 (347.04)*	1106.94 (207.50)***	0.24 (0.02)***	0.27 (0.01)***
	N	541.10 (208.35)***	527.91 (112.73)***	504.35 (254.00)**	470.29 (144.94)***	386.99 (230.08)*	807.19 (132.65)***	5471.96 (1982.25)*	3167.31 (1399.73)**
	CW	1442.32 (348.70)***	1026.97 (174.22)***	965.84 (311.69)***	1233.13 (164.53)***	668.85 (300.33)**	825.90 (184.29)***	2997.45 (1777.30)*	4188.31 (1013.18)***
	C	1147.92 (318.77)***	858.30 (188.46)***	813.92 (336.55)**	808.24 (207.78)***	NS	NS	4768.54 (1531.56)***	2454.70 (1095.44)**
Education	**SE**	834.63 (25.67)***	535.32 (14.28)***	910.74 (27.58)***	575.94 (16.20)***	698.68 (22.19)***	465.98 (13.26)***	1452.03 (135.48)***	997.18 (85.05)
	N	896.09 (20.97)***	588.03 (11.34)***	1013.75 (22.54)***	712.93 (12.85)***	781.82 (19.91)***	523.21 (11.47)***	1218.36 (176.54)***	900.11 (124.66)***
	CW	893.61 (24.57)***	560.15 (12.27)***	971.11 (25.19)***	644.42 (13.29)***	145.38 (19.73)***	512.67 (12.11)***	962.00 (138.25)***	879.88 (78.81)***
	C	703.60 (20.36)***	468.77 (12.04)***	809.66 (21.51)***	585.15 (13.28)***	598.09 (17.89)***	451.08 (11.73)***	994.16 (106.64)***	773.96 (76.27)***
Own Business	**SE**	519.19 (171.93)**	188.65 (95.67)**	-293.61 (178.45)*	NS	NS	155.50 (80.52)*	NS	NS
	N	1411.93 (208.84)***	1106.76 (112.99)***	1392.33 (241.90)***	971.35 (137.92)***	1564.47 (198.69)***	1060.66 (114.55)***	NS	NS
	CW	297.14 (174.34)*	NS	NS	262.00 (97.50)***	815.02 (130.18)***	450.98 (79.88)***	NS	NS

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	C	NS	-181.17 (73.51)**	NS	NS	243.22 (105.54)**	124.02 (69.24)*	NS	NS
Financial Income	**SE**	0.33 (0.01)***	0.59 (0.00)***	0.03 (0.00)***	-94.11 (104.78)***	0.14 (0.01)***	0.49 (0.00)***	NS	-0.02 (0.00)***
	N	0.18 (0.00)***	0.38 (0.00)***	0.14 (0.00)***	0.67 (0.00)***	0.21 (0.00)***	0.34 (0.00)***	0.17 (0.01)***	0.19 (0.01)***
	CW	0.15 (0.01)***	0.62 (0.00)***	0.31 (0.01)***	0.90 (0.00)***	0.05 (0.00)***	0.42 (0.00)***	0.49 (0.04)***	0.65 (0.02)***
	C	0.37 (0.01)***	0.70 (0.00)***	0.02 (0.00)***	0.02 (0.00)***	0.31 (0.00)***	0.33 (0.00)***	0.07 (0.04)**	0.11 (0.02)***
Medical Expenses Insurance	**SE**	7485.79 (549.73)***	4261.99 (305.89)***	10427.8 (691.04)***	0.83 (0.00)***	8343.87 (515.77)***	2687.16 (308.39)***	16080.71 (2562.41)	4421.03 (1608.61)***
	N	12226.85 (391.38)***	5020.94 (211.76)***	10749.57 (467.83)***	3872.23 (266.95)***	11102.4 (383.12)***	3327.22 (220.88)***	21501.26 (2835.57)***	7684.50 (2002.29)***
	CW	12544.22 (606.39)***	5305.20 (302.97)***	12474.17 (587.55)***	5502.63 (310.16)***	9469.30 (484.54)***	2592.38 (297.32)***	9244.86 (2662.58)***	8625.45 (1517.85)***
	C	12051.97 (588.42)***	3838.58 (347.88)***	11323.25 (631.76)***	2271.00 (390.05)***	5878.90 (526.19)***	3967.23 (345.18)***	9387.68 (2184.89)***	NS
Life Insurance	**SE**	4834.77 (293.30)***	1906.91 (163.20)***	3628.75 (329.74)***	4100.66 (405.77)***	3942.79 (273.89)***	2362.75 (163.77)***	7785.11 (1423.96)***	5282.57 (893.92)***
	N	3234.49 (237.71)***	1829.36 (128.62)***	3964.61 (272.45)***	2375.06 (155.39)***	3811.22 (250.37)***	2033.02 (144.35)***	3521.05 (1585.07)**	3768.63 (1119.27)***
	CW	3591.51 (308.25)***	1672.12 (154.01)***	4273.43 (343.33)***	2337.00 (181.24)***	4084.01 (270.04)***	2198.60 (165.70)***	NS	NS
	C	3038.19 (299.34)***	1969.02 (176.97)***	3423.49 (301.02)***	2692.32 (185.85)***	3637.33 (272.81)***	1712.95 (178.96)***	5597.78 (1368.11)***	2455.20 (978.53)**
Credit Card	**SE**	3746.17 (142.15)***	2326.94 (79.10)***	4401.65 (154.06)***	2195.85 (193.62)***	3700.95 (124.76)***	2300.64 (74.60)***	5097.33 (728.44)***	3617.82 (457.29)***
	N	3651.66 (113.02)***	2210.68 (61.15)***	3917.56 (122.34)***	2561.43 (69.79)***	4120.53 (106.53)***	2714.37 (61.42)***	6566.77 (860.19)***	5395.51 (607.41)***
	CW	4593.62 (146.14)***	2451.56 (73.02)***	5023.28 (155.43)***	2748.39 (82.05)***	4384.66 (116.74)***	2747.73 (71.63)***	6601.09 (781.29)***	4066.54 (445.39)***
	C	4713.88 (130.43)***	2793.63 (77.11)***	4969.06 (140.33)***	2924.47 (86.64)***	3937.91 (109.89)***	2604.82 (72.09)***	5063.76 (631.09)***	4517.66 (451.38)***

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DISCUSSION

This study presents eight independent variables (savings, pension plan, education, business ownership, financial income, medical expense insurance, life insurance, and credit cards) and two dependent variables (household income and expenses). The five most significant financial variables affecting household income are savings, education, medical expense insurance, life insurance, and credit cards. An analysis of the data from 2016, 2018, and 2020, as presented in Tables 2, 3, and 4 respectively, reveals that the most dominant variable is medical expense insurance. Life insurance and credit cards emerged as the two most important variables for family income. Education consistently showed a significant positive relationship with income; however, its impact was five to six times lower than that of credit cards and life insurance. Finally, savings exhibited a minimal impact on income, contributing less than $2 pesos (approximately 0.10 USD) to household income. Therefore, while statistically significant, this variable was not deemed highly relevant.

The seven most important financial variables affecting household expenses are savings, pension plans, education, financial income, medical expense insurance, life insurance, and credit cards. An analysis of Tables 2, 3, and 4 reveals that medical expense insurance is the most dominant variable. Similar to its effect on income, the use of credit cards and life insurance emerge as the next most significant variables. Education and pension plans are also found to have a significant impact on expenses, although at levels below $1,000 pesos (approximately 50 USD). Regarding savings and financial income, both variables were consistently positive and significant across all years; however, their impacts were relatively small. As noted, the COVID-19 pandemic has impacted nearly all sectors, including politics, economics, and society. One variable that demonstrated a distinct trend following the pandemic was credit card usage. For both income and expenses, credit cards were the second most important variable, with significant but negative results. Table 5 illustrates that the use of these financial tools would decrease income by $7,732.43 pesos and expenses by $6,237.28 pesos. The other variables remained consistent with those observed in previous years.

Although the hypothesis for this research was not accepted as initially presented (due to the absence of a combined impact of all the variables on income and expenses), the findings offer valuable insights for families seeking to improve their financial situation in terms of both income and expenses, which constitutes the primary contribution of this study. As Dwiastanti (2015) stated, high income levels without effective financial management will not result in prosperity for individuals and families; rather, the successful application of financial literacy, encompassing sound financial behaviour, would lead to an enhanced standard of living. In such cases, the most influential variables impacting household income and expenses are the acquisition of medical expense insurance, the acquisition of life insurance, and the use of credit cards. These

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three variables are particularly significant because, based on data from 2020, the last survey conducted before the pandemic, households' income would increase by over $18,000 pesos (approximately 900 US dollars) with medical expense insurance, nearly $6,500 pesos (around 325 US dollars) with life insurance, and over $6,700 pesos (roughly 335 US dollars) through the use of credit cards. This situation can be explained by the resources a family would save in the event of an emergency due to the two types of insurance, or by the enhanced ability to acquire products and services through the additional financial capacity provided by credit products. From an expenses perspective, a family would have extra resources to spend: almost $9,800 pesos (around 490 US dollars) due to medical expense insurance, nearly $4,200 pesos (about 210 US dollars) through the use of credit cards, and over $4,000 pesos (roughly 200 US dollars) with life insurance.

Education, savings, and pension plans are key variables that reflect higher levels of financial literacy. However, an increase in the amounts associated with both income and expenses is not considered significant. As suggested by Graña-Alvarez et al. (2024), our results highlight key financial factors that could assist families and individuals in better managing their finances, such as the significance of having medical expense insurance, life insurance, and the use of credit cards to enhance income or expenses. Specifically, the finding that medical expense insurance and life insurance are the most crucial factors for long-term investments or unforeseen negative situations aligns with the conclusions of (Dwiastanti, 2015; Mireku et al., 2023), who stated that financial literacy reduces individuals' vulnerability, with insurance serving as a tool for managing financial uncertainty. We concur with Ibarra López and Tapia Cortés (2022) regarding the relationship between insurance and income. In line with these findings, studies conducted by Dogan et al. (2022) in Turkey and Zhang and Posso (2019) in China have demonstrated that financial inclusion positively impacts household income, enabling increased health expenditure. Additionally, Nguyen et al. (2025) suggest that the promotion of health insurance helps protect households from severe indebtedness when faced with a significant health crisis.

Our results are consistent with those of Lusardi and Mitchell (2011a) and Ibarra López and Tapia Cortés (2022), where education is strongly correlated with financial literacy, yet it is not the most influential factor in determining the amount of money. Nevertheless, higher education does influence financial behaviour, leading to more effective personal finance management, as suggested by (Graña-Alvarez et al., 2024). In contrast to Lusardi and Mitchell (2011b), who argued that education is not a reliable proxy for financial literacy, our study found that education is indeed a relevant factor in enhancing financial knowledge. Finally, two unexpected results emerged. The first was observed in the 2022 survey, where the use of credit cards had a negative impact on both income and expenses. We conclude that, while credit cards typically represent

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positive financial tools in normal cycles, after the pandemic, families may have resorted to them as a survival mechanism, often without a well-structured plan or rational decision-making process. This aligns with a statement by Gathergood (2012), who suggested that the lack of self-control may be linked to high levels of credit card usage. Similarly, Lusardi and Mitchell (2011a) noted that credit cards are commonly used as a source of funds during times of crisis. However, this conclusion was not corroborated by the results of the present study. The second unexpected result was that owning a business did not show a significant impact on household income or expenses in 2022. This may reflect the lingering effects of the restrictions imposed by the COVID-19 pandemic, which led to the failure of numerous small businesses.

CONCLUSION

The hypothesis of this study relates to a set of financial literacy factors that influence household income and expenses. The results indicated that the factors analysed had varied, inconsistent, and not always significant effects. Consequently, the hypothesis is rejected with regard to the simultaneous impact of all factors. However, when analysed individually, many variables demonstrated a notable effect on the financial behaviour of families and households. The core findings of the study reveal that traditional elements of financial literacy, such as education and savings accounts, were not as influential in affecting changes in income or expenses as other variables. However, the possession of health and life insurance emerged as a crucial financial factor impacting household income. Consequently, it is recommended to promote these risk-management tools to increase their coverage. Financial literacy focused on the knowledge, understanding, and use of such insurances could have a positive effect on household welfare. The use of credit cards is also significant, although it is essential to balance their use with the risks of over-indebtedness, thereby underscoring the importance of adequate financial literacy.

One limitation of this study was the presence of a substantial number of repeated data points within the 2020 database, which led to non-significant relationships among all variables in Model II. This was the only instance where data was derived solely from Model I, without validating the robustness of the model. Another limitation is that this study utilised data from Mexico, a developing economy, and results may vary in different cultural and contextual settings. Additionally, the surveys did not specifically measure financial literacy, which restricted the range of variables available for analysis. The results obtained indicated that owning a business was not statistically significant for either households' income or expenses, which contrasts with the findings from previous periods. Therefore, further studies are recommended to determine whether, following the COVID-19 pandemic, the economic dynamics shifted to the extent that the impact of self-employment on household welfare was diminished, or whether these

results were merely a temporary effect of the mobility restrictions imposed during the pandemic. Additionally, we suggest conducting studies at the regional level, as even within a single nation, there may be diverse contexts and varying socioeconomic levels.

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ETHICAL COMPLIANCE

Ethical approval was not sought for the present study because it did not involve human participants.

DATA ACCESS STATEMENT

This data is available from publicly accessible repositories. The original data presented in this study are openly available in INEGI at
https://www.inegi.org.mx/programas/enigh/nc/2016/
https://www.inegi.org.mx/programas/enigh/nc/2018/
https://www.inegi.org.mx/programas/enigh/nc/2020/
https://www.inegi.org.mx/programas/enigh/nc/2022/

CONFLICT OF INTEREST DECLARATION

The authors declare that they have no affiliations with or involvement in any organization or entity with any financial interest in the subject matter or materials discussed in this manuscript.

AUTHORS CONTRIBUTION

Conceptualization (HR,LD,SR), methodology (LD,SR), validation (HR), Formal Analysis (SR,HR), investigation (LD), Data Curation (LD), Writing-Original Draft Preparation (HR,LD), Writing-Review and Editing (HR), visualization (LD), supervision (SR), and Project Administration (HR).

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