Box 2

REMITTANCES, CONSUMER CREDIT AND NON-PERFORMING LOANS IN MEXICO

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Introduction

Developing a sound and accessible financial system is essential for fostering economic growth and reducing poverty, especially in emerging market economies.[2] In this setting, remittances – money transfers sent by migrants to their families in their country of origin – have become increasingly important in Mexico. Indeed, more than 10% of households receive remittances and for 60% of these they constitute their first or second source of income.[3]

According to the economic literature, access to financial services encourages investment, smooths consumption in the face of shocks and contributes to social mobility.[4] In developing countries remittances can foster financial deepening, by increasing banking penetration and facilitating access to credit.[5] However, they have contrasting effects on debt: on the one hand they can serve as a guarantee and enhance borrowers' credit histories, incentivising bank lending, but on the other hand, as they ease liquidity constraints, they can also reduce demand for bank funding.[6]

This box analyses the impact of remittances on consumer credit and non-performing loans (NPLs) in Mexico, focusing particularly on the different effects by loan type and borrower profile.

Data and methodology

The analysis focuses on consumer credit, which includes personal loans, microcredits, loans for consumer durables (excluding cars), car loans and payroll loans. These products have different conditions in terms of interest rates, amounts and terms and can be split into two main segments:

- High-quality segment: car loans and payroll loans, which are generally larger, longer term and with lower interest rates.
- Low-quality segment: personal loans, microcredits and loans for consumer durables, which tend to be smaller, shorter term and with higher interest rates.

The information available covers 83% of fixed-term credit in Mexico and 96% of Mexican municipalities. The regional distribution (Table 1) shows that there is a higher proportion of low-quality loans and remittances in medium-high and high-poverty areas, and a higher proportion of high-quality loans in lower-poverty areas.

To estimate the impact of remittances on consumer credit and NPLs, a municipal-level panel data model is used, with half-yearly information for more than 2,000 municipalities between 2017 and 2019. Three dependent variables are analysed: outstanding credit, NPLs and the NPL ratio (NPLs to total outstanding loans).

The model includes half-year and municipality-year fixed effects and controls for state-level economic activity and real wages.[7] To address possible problems of reverse causality and unobserved factors, an instrumental variables specification is used, taking the unemployment rate in the United States (in particular, that of persons of

1 Martín Tobal is the Director of Macrofinancial Risk Analysis at the Banco de México. The views expressed do not necessarily reflect the position of that or any other institution. The results are based on David Heres, David Jaume, Everardo Tellez de la Vega and Martín Tobal. (2023). "Credit Use, Credit Delinquency Rates and Remittances". Mimeo, Banco de México, 21 October.

2 Ross Levine. (1997). "Financial Development and Economic Growth: Views and Agenda". *Journal of Economic Literature,* Vol. 35(2), pp. 688-726; Ross Levine, Norman Loayza and Thorsten Beck. (2000). "Financial intermediation and growth: Causality and causes". *Journal of Monetary Economics,* Vol. 46(1), pp. 31-77; and John H. Boyd, Ross Levine and Bruce D. Smith. (2001). "The impact of inflation on financial sector performance". *Journal of Monetary Economics,* Vol. 47(2), pp. 221-248.

3 According to the 2015 Intercensal Survey of the National Institute of Statistics and Geography (INEGI). Between 2016 and 2019, remittances grew on average by 10% per year. In 2019 they accounted for 2.9% of GDP and 4.5% of household spending. See Jesús A. Cervantes. (2019). "Las remesas y la medición de la pobreza en México". CEMLA.

4 Hossein Jalilian and Colin Kirkpatrick. (2002). "Financial development and poverty reduction in developing countries". *International Journal of Finance & Economics,* Vol. 7(2), pp. 97-108; World Bank. (2001). *World development report 2000/2001.* Oxford University Press; Robin Burgess and Rohini Pande. (2005). "Do Rural Banks Matter? Evidence from the Indian Social Banking Experiment". *American Economic Review,* Vol. 95(3), pp. 780-795; Dean Karlan and Jonathan Zinman. (2010). "Expanding Credit Access: Using Randomized Supply Decisions to Estimate the Impacts". *The Review of Financial Studies,* Vol. 23(1), pp. 433-464; and Abhijit Banerjee, Emily Breza, Esther Duflo and Cynthia Kinnan. (2019). "Can Microfinance Unlock a Poverty Trap for Some Entrepreneurs?". NBER Working Paper Series, 26346, National Bureau of Economic Research.

5 Reena Aggarwal, Asli Demirguc-Kunt and María Soledad Martínez Pería. (2011). "Do remittances promote financial development?". *Journal of Development Economics,* Vol. 96(2), pp. 255-264; and Diego Anzoategui, Asli Demirguc-Kunt and María Soledad Martínez Pería. (2014). "Remittances and Financial Inclusion: Evidence from El Salvador". *World Development,* Vol. 54, pp. 338-349.

6 Paola Giuliano and Marta Ruiz-Arranz. (2009). "Remittances, financial development, and growth". *Journal of Development Economics,* Vol. 90(1), pp. 144-152; and Christian Ambrosius and Alfredo Cuecuecha. (2013). "Are Remittances a Substitute for Credit? Carrying the Financial Burden of Health Shocks in National and Transnational Households". *World Development,* Vol. 46, pp. 143-152.

7 A state is a larger political-administrative unit that includes municipalities.

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Mexican origin) as an instrumental variable for remittances.[8] This approach makes it possible to isolate the exogenous variation in remittances stemming from US labour market shocks that affect the supply of remittances but not the demand for credit in Mexico.

Results

Effect of remittances on consumer credit. The results show that a 10% increase in the remittances received by a municipality drives up outstanding consumer credit by 1.8%. This positive impact is concentrated in the high-quality segment: a 10% increase in remittances prompts a 2.2% rise in outstanding consumer credit in this segment, while in the low-quality segment there is no significant impact. These results are presented in Table 2 (column (1)).[9]

Effect on NPLs. Remittances also help lower NPLs. A 10% increase in remittances reduces NPLs by 5.4% and the NPL ratio by 0.24 percentage points (pp). This effect is especially relevant in the low-quality segment, where NPLs fall by 8.3% and the NPL ratio by 0.44 pp. By contrast, no significant effect is detected in the high-quality segment (columns (2) and (3) of Table 2).

Differences by gender. Analysis by gender shows that remittances have a more marked impact on women, who are the main recipients of these transfers. A 10% increase in remittances drives up women's outstanding credit by 2.3%, which is almost double the growth in men's outstanding credit (1.4%). In addition, the decrease in NPLs is greater for women: NPLs decline by 7.3% and the NPL ratio by 0.29 pp, compared with a drop of 4% and of 0.18 pp, respectively, for men (panel C of Table 2).

Discussion and conclusions

The results obtained highlight the dual role that remittances play in the Mexican financial system: they complement soft loans, facilitating access to higher quality products, and help reduce NPLs, especially among the most vulnerable segments and among women. This mitigating effect on

Table 1
Regional coverage and distribution of remittances and consumer credit

	Coverage: municipalities		Distribution: proportion in municipalities by poverty level			
			Low	Medium-low	Medium-high	High
	Number	%	< 28%	(28%-40%)	(40%-57%)	> 57%
1 Population (Mexico)	2,457	100	25%	25%	25%	25%
2 Remittances	2,362	96	20%	19%	30%	30%
3 Low-quality credit segment						
Total	2,365	96	32%	27%	23%	17%
Microcredits	2,181	89	18%	25%	31%	25%
Consumer durables	2,197	89	18%	25%	32%	24%
Personal loans	2,359	96	35%	27%	21%	15%
4 High-quality credit segment						
Total	2,352	96	40%	29%	20%	9%
Payroll loans	2,266	92	45%	28%	17%	8%
Car loans	2,344	95	36%	29%	23%	10%
5 Mortgage loans	1,858	76	55%	28%	13%	3%

SOURCE: Author's calculations, drawing on information from the Banco de México, the Comisión Nacional Bancaria y de Valores and the INEGI.
NOTE: The low-quality segment groups together microcredits, personal loans and loans for consumer durables. The high-quality segment covers car loans and payroll loans. Municipalities are divided into four groups (quartiles) of equal population size based on poverty levels in 2015.

8 See the Table 2 footnote for more information on how the instrument is constructed.

9 In the first stage of the estimation, the effect on the volume of remittances of the instrument – the state-level unemployment rate of Mexican migrants in the United States relevant for each municipality – is estimated. Based on the usual contrasts, this effect is significant (see the Table 2 footnote for more details).

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credit risk enhances recipients' credit histories and increases their chances of accessing financing in the future, creating a virtuous circle of inclusion and financial stability.

From a public policy standpoint, these findings underscore the importance of promoting banking penetration and the use of formal financial services among households that receive remittances, and of designing products tailored to their specific needs. They also increase the importance of remittances as a social protection mechanism and as a way to reduce financial vulnerability among low-income and informal-economy households.

Table 2
Effect of remittances on outstanding credit, NPLs and the NPL ratio, by credit segment and borrower gender

	Outstanding credit (1)	NPLs (2)	NPL ratio (3)
	Panel A. All loans		
Log of remittances	0.1823***	-0.539***	-0.0236***
	(0.071)	(0.251)	(0.0009)
	Panel B. By credit segment		
i) Low quality	-0.001	-0.831**	-0.0441***
	(0.072)	(0.337)	(0.016)
ii) High quality	0.218***	0.830	0.0001
	(0.083)	(0.647)	(0.006)
	Panel C. By borrower gender		
i) Women	0.229****	-0.725**	-0.0289***
	(0.086)	(0.347)	(0.011)
ii) Men	0.138*	-0.396	0.0182**
	(0.062)	(0.284)	(0.009)
Observations	14,132	14,132	14,132

SOURCE: Author's calculations, drawing on information from the Banco de México, the Comisión Nacional Bancaria y de Valores and the INEGI.
NOTE: A two-stage model is estimated, using as an instrument the unemployment rate at state level of persons of Mexican origin in the United States relevant for each Mexican municipality, constructed as the sum for all US states of the unemployment rate of persons of Mexican origin in each state, taken from the Current Population Survey, based on the proportion of migrants from that municipality established in that state, estimated for 2002-2012 by María Esther Caballero, Brian C. Cadena and Brian K. Kovak. (2018). "Measuring Geographic Migration Patterns using *Matriculas Consulares*". *Demography*, Vol. 55(3), pp. 1119-1145. All regressions include half-year and municipality-year fixed effects and controls for state-level economic activity and real wages. Standard errors are clustered at the municipality-year level and are reported in brackets. Low-quality loans include personal loans, microcredits and loans for small consumer durables. High-quality loans are car and payroll loans. The Kleibergen-Paap Wald rk F statistic in the first stage is 12.08 in all regressions. The significance levels are denoted as follows: ***1%, **5% and *10%.