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Does household financial access facilitate law compliance? Evidence from Mexico

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HIGHLIGHTS

- Private markets can impose incentives for law compliance.
- We measure the impact of access to Banco Azteca on formality.
- We compare households in municipalities where Banco Azteca opened with those where it did not.
- Before the bank's expansion, there is no correlation between Azteca and bank access or formality.
- After the expansion, exposed households have higher bank access and are more likely formal.

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ABSTRACT

We investigate the impact of financial access on law compliance (whether workers are registered in a mandated social security system). In contrast to previous studies that focus on firms' access to credit, we investigate workers' access to credit. Exploiting the geographic variation in financial access due to Banco Azteca's opening in Mexico in 2002 that changed financial access by poor people almost over-night, we find that financial access increased the probability of getting formalized.

1. Introduction

In developing countries, laws and regulations are generally weakly enforced. Recent literature recognizes that while many laws exist to correct market failures, markets themselves may also contribute to facilitate law compliance (Greenstone and Jack, 2013). Most of the existing literature explores the impact that the legal system has on the functioning of financial markets.[1] In this paper, we investigate whether private financial institutions can facilitate law enforcement and increase state capacity by getting firms to enroll workers in a mandated national social security system in Mexico.

The negative correlation between financial access and informality is well documented.[2] However, isolating the causal impact of financial access on law compliance in general or informality in particular is a challenging task. First it requires researchers to observe law (in)compliance. Second, as the causality could go in both directions, and as there may be a third factor that could drive both, it is necessary to exploit changes in credit availability that are not driven by demand or other possible factors that might be directly related to law compliance.

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[1] See, for example, La Porta et al. (1998), Johnson et al. (2002), Laeven and Woodruff (2007) and Hanson (2010).

[2] See, for example, La Porta and Shleifer (2008) and Koeda and Dabla-Norris (2008). Catao et al. (2009) show that financial access is associated with more formal employment and more so for more external-finance dependent industries (a la Rajan and Zingales (1998)). See also Schneider and Enste (2000) for a survey of this literature.

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Table 1
Summary statistics in 2002.

	No Azteca	Azteca	Total
Access to bank	0.06***	0.10***	0.08
	[0.01]	[0.01]	[0.00]
Formal household	0.16***	0.29***	0.23
	[0.01]	[0.01]	[0.01]
Household head income	17 920.67***	27 446.58***	23 005.62
	[800.23]	[818.68]	[578.37]
Married	0.67	0.65	0.66
	[0.01]	[0.01]	[0.01]
Household head age	49.71***	46.31***	47.9
	[0.31]	[0.28]	[0.21]
Male	0.79***	0.75***	0.77
	[0.01]	[0.01]	[0.01]
Number of children	1.1	1.1	1.1
	[0.03]	[0.02]	[0.02]
No income	0.35***	0.30***	0.32
	[0.01]	[0.01]	[0.01]
No schooling	0.19***	0.12***	0.15
	[0.01]	[0.01]	[0.01]
At most primary school	0.54***	0.46***	0.5
	[0.01]	[0.01]	[0.01]
At most high school	0.20***	0.31***	0.26
	[0.01]	[0.01]	[0.01]
Higher than high school	0.07***	0.11***	0.09
	[0.01]	[0.01]	[0.00]

Notes: The first column is the statistics for households whose municipalities did not experience the expansion of the Banco Azteca, while the second for those did experience, and the third for the households together. Standard deviation of the means in parentheses.
Significance of the test of the equality of the mean of the two groups:
* 10%.
** 5%.
*** 1%.

2. Background

Mexico provides a good setting in which we can satisfy the two requirements mentioned above to investigate the impact of access to finance on informality. The Mexican Social Security and labor laws require all firms to register their salaried workers into a Social Security System. Private firms must register their workers in the Instituto Mexicano del Seguro Social (IMSS) which offers a large set of benefits, such as health insurance, day care for children, disability and retirement pensions, and household loans. Less than 40% of the Mexican workforce is registered in the Social Security System. Among private firms, 36% of salaried workers were not registered in IMSS as of 2005 (Levy, 2010). In 2002, a large electronics retailer (Elektra) was given a banking license by the government. In a few days, Banco Azteca branches opened in Elektra stores throughout the country, offering clients to open savings accounts, and providing the same credit lines that Elektra stores had been offering. By December 2002, 250,000 savings accounts had been opened with Banco Azteca. Perhaps surprisingly, after savings accounts, the first product introduced in 2003 by Banco Azteca was directly targeted at workers in the formal sector: "Nomina Empresarial", which consisted on a debit card in which formal workers could receive their salary as a transfer from their employers. Shortly after, Banco Azteca started to expand its larger "personal credit" lines, which had to be collateralized by households' assets and appliances if applicants lacked proof of income.[3] Banco Azteca's loan portfolio was 10 billion Mexican pesos by 2004, while the combined portfolio of the largest microfinance institutions in Mexico stood at only 0.5 billion Mexican pesos in the fourth quarter of 2004. Later, it expended to the mortgage and insurance business. While still catering to lower-income segments of the Mexican population, workers in the formal sector were one of the targets of the financial products offered by Banco Azteca between its creation and the second round of the MXFLS. We then argue that Banco Azteca's expansion created incentives to its traditional clients to become formalized in order to access this larger set of financial products.[4]

By exploiting the 2002 and 2005 panel of the Mexican Family Life Survey (MXFLS) rounds, we are able to construct household-level, time-varying measures of informality and bank access. And, because in 2002 Banco Azteca's opening changed almost overnight financial access by poor people, we exploit the geographic variation in the location of Banco Azteca branches as our source of variation in access to finance.[5] Banco Azteca's expansion is an attractive source of variation also because it changed households' or self-employed firms' financing options, but not other firms' financing option as the scale of lending is very small. This allows us to isolate the impact of households' access to finance from that of firms' access to finance.

3. Data

The MXFLS survey is representative at the national level and contains very detailed information on a variety of topics. In particular, this paper focuses attention to individual's possession of formal savings accounts, and whether workers are affiliated to IMSS through their employers. The timing of the two survey waves is particularly useful for analyzing the impact of Banco Azteca's expansion, as by the 2002 wave, Elektra had not been granted its banking license and, by 2005, the presence of Banco Azteca varied across municipalities in our sample. Our analysis focuses on individuals surveyed on both waves for all variables listed in Table A.1 are available. Our final sample then consists of 5108 households in 278 Mexican municipalities. The MXFLS was merged with a listing from the National Banking and Securities Commission (CNBV), which contains the location and year of opening of all bank branches across Mexican municipalities.

The difference in characteristics between Azteca and non-Azteca municipalities in 2002 are shown in Table 1. The comparison shows that the households in municipalities that experienced Banco Azteca expansion are on average richer, more educated, more likely to have bank access and more likely to be formal.

4. Specification

The approach we follow in order to determine if the expansion of Banco Azteca can be used as a source of arguably exogenous variation in bank access for individuals in our sample is to explore if minimum geographic and community size control variables explain the differences in mean observed in Table 1. We the restrict

[3] https://www.abm.org.mx/anuario/anuario2003/docs/BancoAzteca.pdf.

[4] Banco Azteca's success may be surprising (its APR in 2005 was 130% compared to 40% of regular banks, and the branches opened are concentrated in municipalities where at least one traditional bank branch existed Ruiz, 2010). Recent evidence, however, suggests that trust in formal banking institutions is low, and that this lack of trust is a potential force behind the lack of participation in the banking sector in Mexico (Bachas et al., 2015). Banco Azteca's branches opened within one of the largest retail stores in Mexico, which had been offering credit lines to its customers for years. Arguably, the trust barrier between Banco Azteca and its customers was already low.

[5] We are not the first to exploit the opening of Banco Azteca. Bruhn and Love (2009) and Ruiz (2010) analyzed the impact of Banco Azteca on self-employed firms' creation and on households' finance decisions, respectively.

Table 2
Regressions of the bank access dummy on Banco Azteca in 2002.

	Bank access dummy			
	(1)	(2)	(3)	(4)
Azteca	0.036***	0.034***	−0.012	−0.010
	(0.012)	(0.010)	(0.013)	(0.012)
State effects	No	Yes	Yes	Yes
Location size dummies	No	No	Yes	Yes
Household characteristics	No	No	No	Yes
R^2	0.004	0.021	0.034	0.086
N	5118	5118	5118	5118

Notes: Standard errors are clustered at the municipality level and shown in parentheses.
Significance:
* 10%.
** 5%.
*** 1%.

Table 3
Regressions of the household formality dummy on Banco Azteca in 2002.

	Household formality dummy			
	(1)	(2)	(3)	(4)
Azteca	0.127***	0.098***	0.026	0.018
	(0.028)	(0.022)	(0.023)	(0.021)
State effects	No	Yes	Yes	Yes
Location size dummies	No	No	Yes	Yes
Household characteristics	No	No	No	Yes
R^2	0.023	0.065	0.083	0.126
N	5118	5118	5118	5118

Notes: Standard errors are clustered at the municipality level and shown in parentheses.
Significance:
* 10%.
** 5%.
*** 1%.

our sample to the 2002 wave, and run regressions of the following form:

$$Y_{ims} = \beta_1 Azteca_{ms} + \delta_s + LocationSize_{ims} + \sum_n \lambda_n X_{nims} + \epsilon_{ims}$$

where i, m, and s denote household, municipality and state, respectively. Y_{ims} is either bank access or formality; $Azteca_{ms}$ is a dummy variable indicating whether a household lives in a municipality that was covered by the Banco Azteca; δ_s is the set of state dummies; $LocationSize_{ims}$ is the set of location size dummies; and X_{nims} is a set of n household characteristics according to the 2002 survey wave, which we include as controls.

Tables 2 and 3 show the results of this specification using bank access and formality status as dependent variables, respectively. Column 1 includes no controls; Column 2 includes state fixed effects; Column 3 additionally includes location size dummies; and Column 4 includes all controls in Column 3, plus the household level characteristics listed in Table A.1. We see from Columns (3) and (4) in Table 2 that households in municipalities that experienced Banco Azteca expansion are not statistically significantly different in terms of their bank access from the other type of households once we controls for location size dummies and state fixed effects. For formality, from Table 3, we see that households in municipalities that experienced Banco Azteca expansion are no more likely to be formal once we control for state fixed effects.

In order to estimate the impact of Banco Azteca's expansion on bank access and formality status, we then run the same set of regressions, this time restricting the sample to the 2005 cross-section (see Tables 4 and 5).

After the bank's expansion, both formality and bank access levels are significantly higher for households living in Azteca communities than in those living in non-Azteca communities.

Table 4
Regressions of the bank access dummy on Banco Azteca in 2005.

	Bank access dummy			
	(1)	(2)	(3)	(4)
Azteca	0.055***	0.060***	0.026**	0.025***
	(0.012)	(0.010)	(0.010)	(0.009)
State effects	No	Yes	Yes	Yes
Location size dummies	No	No	Yes	Yes
Household characteristics	No	No	No	Yes
$R2$	0.011	0.031	0.042	0.102
N	5118	5118	5118	5118

Notes: Standard errors are clustered at the municipality level and shown in parentheses.
Significance:
* 10%.
** 5%.
*** 1%.

Table 5
Regressions of the household formality dummy on Banco Azteca in 2005.

	Household formality dummy			
	(1)	(2)	(3)	(4)
Azteca	0.141***	0.153***	0.061***	0.047**
	(0.026)	(0.021)	(0.021)	(0.018)
State effects	No	Yes	Yes	Yes
Location size dummies	No	No	Yes	Yes
Household characteristics	No	No	No	Yes
R^2	0.026	0.075	0.100	0.159
N	5118	5118	5118	5118

Notes: Standard errors are clustered at the municipality level and shown in parentheses.
Significance:
* 10%.
** 5%.
*** 1%.

Controlling for state and community size fixed effects reduces the estimates significantly, but the coefficients measuring the impact of Banco Azteca's expansion on bank access and formality never lose significance. According to the specifications including all controls, households living in Azteca communities are 2.5% points more likely to have a bank account, and 4.7% points more likely to be formal. We then interpret these results as evidence supporting the hypothesis this paper attempts to test: households in municipalities in which a Banco Azteca branch opened between 2002 and 2005 increased their probability of being employed in the formal sector.

5. Robustness

This far, we have presented two sets of cross-sectional results. However, given the panel structure of the dataset, we can easily fully control for household-level time invariant observable and unobservable characteristics, by running regressions of the following form:

$$Y_{imst} = \gamma_i + \beta Azteca_{ms} * After_t + \delta_s * After_t + LocationSize_{ims} * After_t + \epsilon_{imst}$$

where all the variables are defined above, except $After_t$, which is a dummy indicating whether the observation is from the 2005 round and γ_i, which indicates household fixed effects. Results of these specifications are presented in Table 6 through Columns from (1) to (4). Columns (1) and (3) include household characteristics and location size times survey round fixed effects. Columns (2) and (4) includes household fixed effects. Columns (1) and (2) confirm through difference-in-differences specifications that the expansion of Banco Azteca increased bank access. Columns (3) and (4) do the same for formality as the outcome. These findings confirm the results presented in the previous section.

Table 6
Dif-in-Dif analysis.

	(1) MXFLS Bank	(2) MXFLS Bank	(3) MXFLS Formality	(4) MXFLS Formality	(5) ENE Formality	(6) ENE Formality
Before	2002	2002	2002	2002	2002	2000
After	2005	2005	2005	2005	2004	2002
Azteca ∗ After	0.028**	0.038**	0.059***	0.042*	0.031**	0.007
	(0.012)	(0.017)	(0.014)	(0.024)	(0.015)	(0.010)
Household characteristics	Yes	No	Yes	No	Yes	Yes
Household fixed effects	No	Yes	No	Yes	No	No
Locationsize ∗ After	Yes	Yes	Yes	Yes	Yes	Yes
State ∗ After	Yes	Yes	Yes	Yes	Yes	Yes
R2	0.606	0.103	0.676	0.167	0.166	0.184
N	10 236	10 236	10 236	10 236	86 284	102 160

Notes: Standard errors are clustered at the municipality level and shown in parentheses.
Significance:.
* 10%.
** 5%.
*** 1%.

Further, a difference-in-differences specification allows us to provide indirect evidence of our implicit identification assumption: that, in the absence of Banco Azteca's expansion, the change in bank access and formality would not have differed for households in municipalities with and without presence of Banco Azteca. As the only existing round of the MXFLS prior to 2005 is the 2002 round exploited throughout the paper, we then construct a similar set of variables using the 2000, 2002 and 2004 rounds of the Encuesta Nacional de Empleo (ENE).[6] We run the same difference-in-differences specification, although we are unable to include the household fixed-effects or use bank access as a dependent variable. Column (5) of Table 6 presents the results using the 2002 and 2004 ENE rounds, confirming that Banco Azteca increased formality. Column (6) replicates the analysis this time exploiting the 2000 and 2002 survey rounds. In the absence of Banco Azteca opening, the estimates obtained are close to and not significantly different from zero, giving us confidence that our identification assumption is satisfied.

6. Conclusion

The interaction between private markets and law enforcement is complex. The literature on the potential impact of the content and enforceability of the law on the development on private markets is vast. However, private markets may also influence law compliance levels. In developing countries' contexts, identifying how private markets may influence law compliance seems considerably relevant, given concerns of low state capacity. Using the MXFLS, this paper shows that households living in municipalities where a Banco Azteca branch opened between 2002 and 2005, significantly increased their probability of having a bank account and of having access to social security through their employers (our definition of formality). In contexts like the Mexican, in which the fraction of workers in the informal sector is large and, as a result, the tax base is low, this finding may have important implications for policy design.

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[6] We describe the data construction in the Appendix.

Appendix

A.1. MXFLS

Table A.1 shows the basic household level variables that we constructed from this dataset for the analysis. The bank access indicator is a dummy variable taking value of one if at least one household member has a bank account. The formality indicator is also a dummy variable taking value of one if at least one household member receives social security through his or her employer.

A.2. ENE

In the main text we provide, apart from our main results, a difference-in-differences specification that allows us to provide indirect evidence of our implicit identification assumption: that, in the absence of Banco Aztecas expansion, the change in bank access and formality would not have differed for households in municipalities with and without presence of Banco Azteca. For this purpose, we use the 2000, 2002 and 2004 rounds of the Encuesta Nacional de Empleo (ENE) and construct a set of control variables as comparable as possible to those used when exploiting the MXFLS, imposing restrictions on the data in order to maximize the comparability of the results across data sources. This Appendix then describes the data construction process for the results exploiting the ENE.

Since the second quarter of 2000 until the third quarter of 2004, INEGI conducted a quarterly rolling-panel survey, the Encuesta Nacional de Empleo. We exploit the information from the second and third quarters of 2000, 2002 and 2004 in order to be able to perform a difference-in-differences analysis both before (exploiting the 2000 and 2002 surveys) and around (exploiting the 2002 and 2004 surveys) Banco Aztecas expansion. While ENE is a rolling-panel including each of the surveyed households for five quarters, in order to maintain the balance in representativeness across survey waves, we only include information for each household once every year of the ENE survey. In particular, a household is defined as formal each year if the household member with the highest labor income (the household head, or the eldest household member in case there was more than one member with highest labor income) declares to be affiliated to IMSS or ISSTE in any of that years quarters. Apart from age, the number of children, gender and marital status dummies, we additionally construct the following education level categories to include as controls: No education (less than six years of completed schooling); Less than high school (6–8 years of completed schooling); and less than

Table A.1
Variables table.

Variable	Definition
	Household characteristics
bank	One if the household has any savings in a bank
formal_hh	One if at least one household member Gets social security from their job.
num_minors	Number of children (under 12)
	Household head characteristics
age_h	Age
gender	Male dummy
married	Married dummy
lninc	Log of yearly income
no_income	No income dummy
edu_no_schooling	No schooling dummy
edu_prim	Primary.
edu_hs	High school.
edu_more	Beyond high school
	Location characteristics
loc_size_1	Population of less than 2500.
loc_size_2	Population between 2500 and 15 000

college (9–11 years of completed schooling), and a community size dummy, taking value of one in communities with less than 2500 inhabitants, as in the MXFLS. In an effort to maximize the comparability of the results obtained from the MXFLS and the placebo test exploiting the 2000 and 2002 survey rounds, we restrict the sample to municipalities included in the MXFLS. Our final sample contains then 50 057, 52 103 and 34 181 households from the 2000, 2002 and 2004 survey rounds, respectively.

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