Dark Banking? Banks and Illicit Deposit Flows
Evidence from the Mexican Drug Trade

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Abstract

Do banks enable organized crime? Does bank regulation effectively insulate financial intermediation from criminal activity? I address these questions using evidence from the drug trade in Mexico, finding that local drug cartel activity causes an increase in bank deposits. Accordingly, branch networks grow in affected areas; this growth is not driven by increased lending opportunities. After the election of a "law-and-order" government, liquidity flows into branches of U.S. banks along the border. I interpret this as evidence that "finance follows crime" in weak institutional environments, and that, absent transnational policy coordination, regulatory arbitrage via cross-border liquidity flows undermines banking regulation.

Introduction

Do banks enable the transmission of illegal liquidity? Does regulation succeed in insulating financial intermediation from organized crime? We lack rigorous answers to these questions, which are important from the point of view of policy. In this paper, I shed light on these questions using the illegal drug trade in Mexico as an empirical laboratory. I find that drug cartel entry into Mexican municipalities causes a steep increase in bank deposits held locally, and bank branch networks grow in areas with organized crime presence. However, lending drops in these localities, implying liquidity windfalls were not used to expand local credit supply. After the 2006 election of a Federal administration in Mexico that cracked down on organized crime, I find significant liquidity windfalls among branches of U.S. banks located along the Mexican border: this is consistent with a marginal substitution in the destination of illicit deposits.

Data

Data on Mexican banks comes from CNBV, a regulatory agency. I merge this data with data obtained from Coscia & Rios (2012), who construct a novel database on areas of drug-cartel activity in Mexico for 1990-2010, using a web crawler to query Google News, searching for the co-occurrence of municipality names with words in a corpus of terms associated with criminal organizations. Data on U.S. bank deposits, as well as geolocation data for bank branches, comes from Summary of Deposits reports, while data on bank financials is from Call Reports. Data on enforcement actions is obtained from the websites of the Board of Governors of the Federal Reserve, the FDIC, and the OCC. Data on drug seizures is from U.S. Customs and Border Protection. Data on drug prices is retrieved from a variety of sources, including the UN Office on Drugs and Crime. Figure 1 plots the spatiotemporal variation in drug-cartel presence in Mexican municipalities. As can be seen, a significant expansion of cartel presence took place from 1995 to 2010.

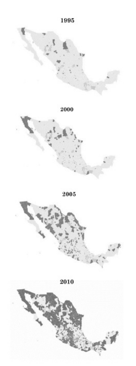

Figure 1: Geographic expansion of drug-cartel activity in Mexico

Empirical Strategy

Several challenges complicate testing the effects of organized crime on local banking outcomes. First, both affected and unaffected regions are exposed to common shocks. Further, cartel presence might be endogenous to local characteristics. Lastly, treatment periods will be location-specific. To deal with these issues, I pursue a generalized differences-in-differences (DiD) empirical strategy in the first part of this paper. Likewise, testing the effect of policy aimed against illicit financial activity is not straightforward. Regulation is not randomly assigned, but originates as a response to extant social phenomena. To get around this problem, in the second part of this paper I run a series of canonical differences-in-differences tests to determine both the impact that a shift in the Mexican regulatory regime had on U.S. banking outcomes, and the endogenous response of banks to this shock.

Results

I first present results for a set of panel regressions with the following specification:

$$\ln(y_{it}) = \alpha_i + \gamma_t + \beta Treated_{it} + \varepsilon_{it} \tag{1}$$

In equation (1), y_{it} is a vector with entries $Credit_{it}$, number of credit-card contracts active in municipality *i* in year *t*, $Deposits_{it}$, total deposits for a given municipality-year, and $Branches_{it}$, the number of bank branches active in this municipality. The model is saturated with municipality and year fixed effects. $Treated_{it}$ is a binary variable which "turns on" if there are cartels active in municipality *i* at time *t*. Cartel presence is found to have an impact of around 29% on deposits, 12% on branches, and -17% on credit card lending. To address concerns that these results might be driven by pre-trends, I present an analysis of coefficient dynamics in Figure 2. In these panels, the X-axis represents time around *first treatment* at the municipality level.

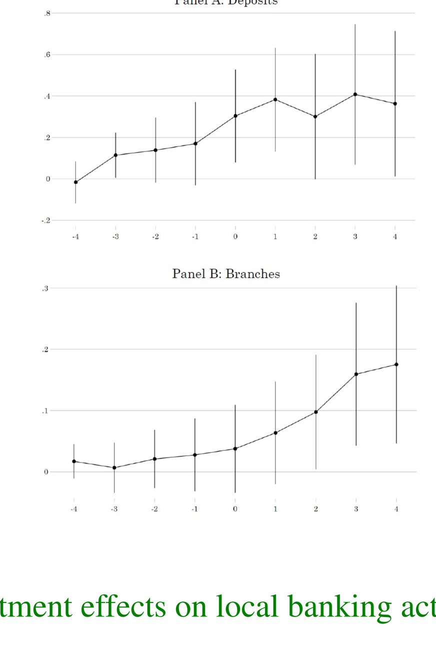

Figure 2: Treatment effects on local banking activity, event time

It is of interest to determine whether increased law enforcement actions or regulatory stringency could shift these estimated elasticities. To test whether a 2006 shock –election of a "law-and-order" party and involvement of armed forces in policing– as well as of 2008 and 2010 shocks –the imposition of deposit controls on banks– had an effect on outcomes of interest, I run the following DiD specification:

$$\ln(Deposits_{it}) = \alpha_i + \gamma_t + \beta(\text{ Treated }_{it} \times \mathbb{1}_{\tau}) + \varepsilon_{it} \tag{2}$$

Results are presented in Table 1; estimations reported are performed both on the entire sample (ATE) and on the assigned-to-treatment sample (ATT). These results indicate that the regulatory tightening brought about by the 2006 election was a negative liquidity event for banks in treated localities.

	(1)	(2)
	ln(Deposits)	
	ATE	ATT
Treated	**0.170***	**0.194*****
	(0.070)	(0.070)
Treated x 2006	**-0.123****	**-0.179****
	(0.061)	(0.062)
Treated x 2007	**-0.042**	**-0.008**
	(0.082)	(0.118)
Treated x 2008	**0.24**	**-0.185**
	(0.211)	(0.21)
Treated x 2009	**0.217**	**-0.12**
	(0.195)	(0.261)
Treated x 2010	**0.375***	**0.173**
	(0.192)	(0.308)
Municipality FE	Yes	Yes
Year FE	Yes	Yes
Observations	12,978	6,284
R-squared	0.324	0.485
Number of clusters (municipalities)	2,379	717

Robust standard errors in parentheses
*** p<0.01, **p<0.05, *p<0.1

Table 1: Treatment effect dynamics

Due to how illicit liquidity was infused into the financial system before these shocks (i.e., through bulk dollar smuggling), I hypothesize that a portion of extant liquidity flows stopped making their way into Mexico and were instead deposited in U.S. banks. To test for these effects, I estimate:

$$\ln(Deposits_{it}) = \alpha_i + \gamma_t + \sum_{\tau \in \mathcal{T}} \beta_\tau Post_\tau \times Distance_{it} + \varepsilon_{it} \tag{3}$$

In the equation above, *i* indexes bank branches, while $Distance_{it}$ is the shortest path between a branch, represented as a latitude-longitude vector, and the U.S.-Mexico border. Results are presented in Table 2.

	(1)	(2)	(3)
		ln(Deposits)	
Distance	**0.046**	**0.026**	**0.047**
	(0.07)	(0.07)	(0.069)
Distance x Post-2006	**-0.068*****		**-0.076*****
	(0.024)		(0.023)
Distance x Post-2012		**0.001**	**0.024**
		(0.019)	(0.017)
Branch FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Observations	5,713	5,713	3,342
R-squared	0.147	0.147	0.147
Number of clusters (branches)	312	312	309

Robust standard errors in parentheses
*** p<0.01, **p<0.05, *p<0.1

Table 2: Differences-in-differences regressions, bank deposits in border counties (U.S.)

It is apparent that the 2006 shock was a positive liquidity event for branches in counties contiguous to the Mexican border. Now, the question becomes whether there was an endogenous branch network response to these liquidity shocks. To test for this, I run canonical DiD specifications of the following type:

$$\ln(Branches_{it}) = \alpha_i + \gamma_t + \beta_1 Distance_{it} + \beta_2(Distance_{it} \times Post_\tau) + \varepsilon_{it} \tag{4}$$

I find that, for each 100 miles closer to the border a ZIP code is, 3-5% more bank branches are active in it after 2006. A potential concern might be that the cross-border flows detected after 2006 correspond to the flight of *licit* capital from Mexico, due to the onset of the Drug War. To rule this out, I test whether deposit receipts in border counties predict enforcement actions by bank regulators after 2006. More precisely, I estimate the equation

$$\mathbb{1}\{Enforcement_{it}\} = \alpha_i + \gamma_t + \beta[\ln(Deposits_{it}^{Border}) \times Post_{2006}] + Decile_{it} + RegDummies_{it} + \varepsilon_{it} \tag{5}$$

Results for this estimation are presented in Table 3. Coefficients on dummy covariates are omitted in the table for brevity.

	(1)
	Enforcement (dummy)
ln(Deposits)	**0.022*****
	(0.007)
Post-2006	**-0.137****
	(0.055)
ln(Deposits) x Post-2006	**0.017*****
	(0.005)
Bank FE	Yes
Year FE	No
Observations	19,725
R-squared	0.035
Number of clusters (banks)	2,138

Robust standard errors in parentheses
*** p<0.01, **p<0.05, *p<0.1

Table 3: Linear probability model, bank enforcement actions (1995-2017)

Conclusions

- Local drug-cartel activity leads to positive liquidity shocks for banks, which respond endogenously by increasing their local footprint.
- Regulatory tightening in law enforcement and AML policy aimed at handicapping the activity of organized crime leads to cross-border liquidity flows.
- In sum, "finance follows crime," i.e. there is growth in both the extensive (branch network expansion) and intensive (deposit capture) margins of banking activity when criminal activity produces liquidity windfalls.

References

[1] M. Coscia and V. Rios. Knowing where and how criminal organizations operate using web content. *Proceedings of the 21st ACM International Conference on Information and Knowledge Management*, pages 1412–1421.