Drug Money and Bank Lending: The Unintended Consequences of Anti-Money Laundering Policies*

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Abstract

This paper documents a hidden cost of anti-money laundering policies. We show that a policy implemented in Colombia reduced bank deposits in high intensity drug trafficking areas, causing banks that source deposits from these areas to cut lending in other areas, negatively impacting employment and number of firms. Additionally, using a proprietary database on bank-firm relationships, we show that small firms that rely on affected banks experience a negative shock to sales, investment, and profitability. Last, we use night lights data to show that these results are not due to a reallocation of activity across firms or to a move to the informal economy.

JEL Classification: K42, G18, G21

Keywords: Money laundering; organized crime; financial system; bank lending; liquidity; economic growth

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1 Introduction

Money laundering is often a key element in organized crime operations. Despite global efforts to deter it, financial globalization as well as rapid developments in technology and communications allow money to flow quickly and easily, facilitating the laundering cycle. Each year, the amount of money laundered globally is estimated to be somewhere between 2% and 5% of global GDP.[1] In this context, the United Nations Office on Drugs and Crime declared that the "task of combating money-laundering is more urgent than ever".[2]

Several studies argue that money laundering undermines the integrity of the financial system, channels resources to less efficient sectors, increases reputation risk, and facilitates corruption, among other things.[3] The economic and social benefits to an effective deterrent to money laundering seems to be fairly straightforward. Nonetheless, there could be unintended consequences to such actions. For instance, money laundering can increase liquidity in the financial system and allow firms to borrow and invest, especially in developing countries (Levi, 2002). In such cases, effective anti-money laundering (AML) policies have important negative consequences. For example, rapid implementation of these policies could produce a sudden decrease in liquidity in the financial system, reducing credit availability. This could lead to a decrease in investment, employment, and economic activity.

Despite the importance and widespread use of AML policies, there are, to the best of our knowledge, no empirical studies analyzing these potential negative consequences.[4] Several empirical challenges could explain this. First, measuring the flow of funds from illicit activities into banks is inherently difficult. Second, aggregate bank data do not allow differentiation between credit supply effects and a decline in firms' credit demand. Third, information linking banks and private firms is rarely available.

In this paper, we empirically analyze the effects of AML efforts on the financial system by studying the implementation of an AML policy in Colombia, a developing economy and the world's largest producer of cocaine. In 2008, the Colombian government issued a regulation that required

[1] Early evidence of the fight against money laundering is the establishment of the Financial Action Task Force on Money Laundering (FATF) at the 1989 G-7 summit, with the goal of coordinating actions against money laundering.

[2] https://www.unodc.org/unodc/en/money-laundering/globalization.html, accessed on July 8th 2019.

[3] See for example Melvin and Ladman (1991), Taylor (1992), Quirk (1997), Masciandaro (1999), Bartlett (2002), Levi (2002), Thoumi (2002), Bagella et al. (2004), Reuter and Truman (2004), Holmes and De Piñeres (2006), Levi and Reuter (2006), Geiger and Wuensch (2007), Argentiero et al. (2008), Barone and Masciandaro (2008), Unger (2009), Dalla Pellegrina and Masciandaro (2009), Ferwerda (2009), Walker and Unger (2009), Schneider (2010), Barone and Masciandaro (2011), Pedroni and Yepes (2011), Slim (2011), Kumar (2012), Ardizzi et al. (2014), Chong and Lopez-De-Silanes (2015), and Loayza et al. (2017).

[4] One potential exception is Collin et al. (2015). However, the authors acknowledge that their data only allows them to observe correlations and not to make systemic judgments. Meanwhile, Ferwerda (2013) compiles a lists of 25 effects of money laundering mentioned in the literature and notes that *"hardly any of the effects are backed by empirical evidence"* (our emphasis).

financial institutions to implement an asset laundering and terrorist financing risk management system (SARLAFT) to identify and manage the risk of being used to launder money. The objective of this policy was to prevent the flow of money from illegal activities into the financial system. We explore the consequences of the implementation of SARLAFT in the financial system in three steps.

First, we study whether the regulation affected the flow of funds into municipalities with higher illicit drug activity. Since illicit drug activity is unobservable, we proxy it using official records of cocaine confiscations at the municipality level prior to the AML policy.[5] Using a difference-in-differences approach, we find that bank deposits in municipalities affected by illicit drug activities declined relative to deposits in non-affected municipalities after the implementation of the AML policy. Quantitatively, a one standard-deviation increase in exposure to illicit drug activities translates into a 1.2 percentage point fall in growth in deposits post-regulation, which is a 12.4% decrease over its pre-regulation average level. Interestingly, the decline in deposits is not immediate, becoming noticeable 18 months after the implementation of the policy and coinciding with stricter enforcement as measured by a dramatic increase in money laundering cases received by the Office of the Prosecutor.[6]

Second, we examine whether bank lending was affected by the negative liquidity shock. To do so, we compare lending by banks that source their deposits in areas with higher illicit drug activity with lending by banks that source their deposits in other areas. One potential concern with this estimation strategy is the effect that the AML policy might have had on credit demand. For instance, it could have reduced the availability of criminal money in the formal economy, reducing consumption and demand for firms' products. Such a decline would lower the demand for credit in areas with high illicit drug activity and might result in an erroneous interpretation of the results. To overcome this problem, we exploit differences in the geographical structure of banks' branch networks and focus on bank lending only in municipalities with little or no drug trafficking activity. Furthermore, we use municipality-time fixed effects that proxy for credit demand at the municipality level, which allows us to isolate the effect of credit supply changes from the demand for credit. We show that banks that source their deposits in areas with higher illicit drug activity reduced lending in areas not directly affected by the AML policy relative to banks that source their deposits from other locations. This finding suggests that the negative liquidity shock led to a contraction in credit supply to areas not directly affected by the AML policy via banks' internal capital markets.

Third, we explore the effect of the negative credit supply shock on economic growth. Using a

[5] While data on the location of illicit coca crops are available, the proceeds from the sale of the final product –cocaine– are approximately six times larger than those of the production of coca leaves, increasing our ability to detect changes in the flow of funds into financial institutions. More information is provided in Section 4.1.

[6] Throughout the paper we refer to the timing of the passage of the policy as the "implementation" date and to the timing of the stricter enforcement of the policy as the "enforcement" date, as measured by a noticeable increase in the number of money laundering cases processed, which more than doubled from 2009:q4 to 2010:q1.

proprietary database, we match bank-firm credit data with firms' financial statements for more than 20,000 predominantly private firms in Colombia for the period 2006-2014. We compare outcomes for firms within the same industry and municipality and exploit differences in indirect exposure to the AML policy. Our previous approach for bank deposits measures the exposure of each bank to the AML policy. In this case, for each firm, we measure exposure to the AML policy as the credit-weighted share of exposure faced by its lenders. We show that the credit supply shock significantly affected growth for small firms. In particular, we find that for small firms, a one-standard-deviation increase in indirect exposure is associated with a 9.3% larger decline in sales, a 10% larger decline in property, plant, and equipment, a 3.4% larger decline in total assets, a 24.3% larger decline in the level of financial debt, and a 2.5% larger decline in net profits.

Last, we examine aggregate effects in municipalities indirectly affected by the negative liquidity shock in three different ways. In particular, we analyze i) number of operating firms, ii) employment, and iii) total economic activity –both formal and informal– as proxied by the intensity of night lights. We find that indirect exposure is associated with a decline in number of firms, employment growth in small firms, and night lights. These results show that our firm-level results correspond not to a reallocation of economic activity across firms or to a shift away from the formal economy, but to a decline in real economic activity.

This paper makes several contributions to the literature. First, it provides novel causal evidence on a negative unintended consequence of AML policies. This contribution stems from our ability to combine a sound research design with unusually detailed data on banks and firms. Papers such as Masciandaro (1999), Bartlett (2002), Geiger and Wuensch (2007), Barone and Masciandaro (2008), Pedroni and Yepes (2011), and Kumar (2012) focus on the benefits and costs of AML policies. However, most papers concentrate on the monetary and operational costs of these policies. Our paper uncovers an additional cost, namely the reduction of the funds available to fund licit businesses via banks' internal capital markets. Related to this, our paper is, to the best of our knowledge, the first one to demonstrate empirically the effectiveness of AML policies in preventing inflows of money from illegal activities into the financial system.

The other main contribution is to provide causal evidence that liquidity shortages in deposits lead to a contraction in credit supply with negative real effects, especially for small firms. Thus, we show the importance of deposit funding for banks. In general, previous studies have shown that liquidity windfalls for banks lead to expansions of credit supply (Gilje et al. 2016; Bustos et al. 2017; Carletti et al. 2019), but there is little evidence of the effect of negative liquidity shocks on firms in a setting where banks do not simultaneously experience solvency issues.[7][8] Two notable exceptions

[7] In papers such as Amiti and Weinstein (2011), Chodorow-Reich (2014), Carvalho et al. (2015), Kalemli-Ozcan et al. (2016), and Huber (2018), banks are affected by both liquidity and solvency shocks.

[8] More broadly, this paper is related to a large literature on the economic effects of credit supply shocks such as Khwaja and Mian (2008), McKenzie and Woodruff (2008), Cole (2009), Jimenez et al. (2012), Banerjee and Duflo

are Schnabl (2012) and Paravisini et al. (2015). Schnabl (2012) looks at a negative liquidity shock experienced by Peruvian banks during the 1998 Russian crisis and how it affected their lending to firms. Relative to this paper, we make two contributions. First, we provide additional evidence on the real effects of a negative liquidity shock on firm-level outcomes such as sales, investment, and profitability, and on municipality-level outcomes, such as number of firms, employment, and real economic activity. Second, we show that negative shocks to funding via deposits –compared to bank-to-bank lending shocks– also lead to economic contractions. Meanwhile, in Paravisini et al. (2015), the authors study the effect of exposure to banks differentially affected by the global financial crisis on Peruvian exporters. However, due to large entry costs involved in exporting, the firms studied are sizable, with average debt levels above one million USD. Our data allows us to study the effect on smaller firms and on aggregate outcomes.

Finally, this study contributes to the literature on organized crime, where papers such as Daniele and Marani (2011), Pope and Pope (2012), Scognamiglio (2018), Pinotti (2015), Bianchi et al. (2017), Dimico et al. (2017), Moglie and Sorrenti (2017), Ganau and Rodriguez-Pose (2018), and Slutzky and Zeume (2018) study the effect of organized crime on development, productivity, and economic growth. We contribute to this literature by identifying an additional mechanism by which criminal activities affect licit firms. By laundering money, criminal organizations provide funds to the financial system that affect growth in regions other than where they operate.

2 Institutional Setting

Colombia is a unique setting to study the effect of illicit drug money on the economy. In this section, we provide an overview of the Colombian economy, its money laundering problem and the efforts to control it. We also describe its banking system.

2.1 The Illicit Drugs Industry

Colombia is the fourth largest economy in Latin America and 39th globally, with a GDP of USD 330.2 billion as of 2018. Its service sector constitutes 56% of the GDP, followed by the industrial sector (38%) and agriculture (6%). It is the 26th largest country in terms of area and has a population of 48.6 million. The country is politically divided into 32 departments and a capital district. The mean department has 1.4 million inhabitants, but the population is highly concentrated in the capital district (Bogota), with over 8 million inhabitants. Each department is split into municipalities, for a total of 1,122 municipalities across the country.[9]

Colombia has a long history with the illicit drugs industry. This business is believed to have

(2014), and Chodorow-Reich (2014). We show that a policy designed to combat money laundering had unintended consequences in the supply of credit.

[9]Source: DANE, Colombian National Department of Statistics.

started in the 1960s with the first marijuana crops and grew rapidly in the 1970s. In the early 1970s - and following pressure from the United States - the Mexican government engaged in a program to eradicate marijuana plantations. Thus, as demand for marijuana in Europe and the U.S. grew, an opportunity to take over the market arose. Colombian growers seized this opportunity.

In the late 1970s the marijuana business declined in Colombia due to increased production in the U.S. (Thoumi, 2002). The growers then transitioned to a more profitable business: cocaine. Initially a small export business to the U.S., it allowed drug traffickers to develop links with suppliers of coca paste from Bolivia and Peru and establish trafficking routes to the U.S. By the 1980s, Colombia had become the largest cocaine producer in the world.

The poor economic conditions in the countryside and the persistence of armed groups such as the National Liberation Army (ELN) and the Revolutionary Armed Forces of Colombia (FARC) in territories with low or nil presence of the state likely contributed to the rise of the cocaine industry. In terms of capacities and process integration, there is one characteristic that distinguished Colombian drug cartels from others. While in countries such as Mexico the drug cartels are involved in specific processes, in Colombia the cartels were vertically integrated, and involved in multiple stages of cocaine production and trafficking.

While the Colombian government has tried to combat drug production and trafficking, several factors limit its effectiveness. First, coca plantations are located in regions where the government has little presence. Second, incarcerated drug dealers can still run their business, since officials are prone to corruption and gangs exercise power inside prisons. In addition to local governments' efforts, the U.S. has helped Colombia fight drug cartels and insurgent groups. This was done through Plan Colombia, an initiative signed by Presidents Pastrana and Clinton in 2000 by which the U.S. government would provide funding and military training to eradicate coca cultivation in Colombia. While supporters of the plan argue it helped transform the country, critics argue that the USD 10 billion plan did little to reduce coca production in Colombia.

Although some things have changed over the last two and a half decades, many others have not. The recent report issued by the United Nations Office on Drugs and Crime provides a rich description of the current situation of coca and cocaine production in Colombia.[10] Evidencing the partial failure of the fight against drug production and trafficking, we find that only three out of thirty two departments (the first political division of Colombia) are coca-free, when there were eight coca-free departments in 2008. Figure I shows the geographical distribution of coca crops across the country. In addition, 80% of the areas with coca plantations detected in 2016 had been previously detected, evidence that growers perceive a low risk of detection or law enforcement. The report also indicates that Colombia produces between 55% and 76% of global cocaine base. Its estimated cocaine hydrochloride production for 2017 is 1,379 metric tons, an increase of 31% over

[10]"Colombia - Survey of territories affected by illicit crops. UNODC (2017)".

its 2016's capacity.

The previous findings shed light on several indisputable facts. Colombia is still the largest cocaine producer in the world, a status that the country has maintained for decades. Illicit drugs activities are scattered across the country, and illicit drugs activity generates large revenues. In the next section, we describe the process by which funds originated in illegal activities - and in this case from the production and trafficking of drugs - enter the financial system.

2.2 Money Laundering

Money laundering is the conversion of revenue from illicit activities into assets that cannot be traced to the originator. There are three stages in the process: placement, layering, and integration. The initial stage involves the placing of funds from illicit activities into the financial system via deposits, the purchase of money orders or checks, or via the cash purchase of financial instruments, such as securities or insurance contracts, among other avenues. The second stage is that of layering. The funds are then moved to create multiple layers between the funds and their origin. In some cases, the funds are used to purchase securities, or used to pay for goods or services via fictitious business expenses and fake invoices, transferring the funds to shell corporations. The last stage is integration. Funds flow into the licit economy via the purchase of assets, such as real estate, luxury goods, or financial assets.

Money laundering is particularly prominent in Colombia. According to the United Nations Office on Drugs and Crime, the amount of money laundered globally each year is equivalent to between 2% and 5% of global GDP.[11] Loayza et al. (2017) estimate that the volume of laundered assets in Colombia ranged from 8% to 14% of GDP between mid-1980 and 2013. While estimates are inherently imprecise and measurement methods might differ, these estimates suggest that Colombia has a major money laundering problem.

2.3 The Fight against Money Laundering

Colombia had basically no measures against money laundering until 1992. In fact, between 1977 and 1991 the Central Bank of Colombia had an office where exporters could exchange currency originated from licit activities. However, since there were no controls in place, drug dealers used that same office to exchange currency from illicit activities (García, 2003). The amount of money laundered via this office might have had important consequences on the exchange rate and the stability of the Colombian currency (Steiner et al., 1997).

Since its inception in 1992, the Office of the Attorney General of the Nation has played a key role in the fight against money laundering, as it was in charge of processing the suspicious

[11] https://www.unodc.org/unodc/en/money-laundering/globalization.html, accessed on July 5, 2019.

transaction reports sent by financial institutions. These reports were issued to inform the Office of the Attorney General about potential money laundering activities, and were triggered whenever there was a financial transaction whose magnitude was inconsistent with an individual's reported income. However, almost no reports were received by this office until many years later.

In 1996, the regulator of the banking sector requested that financial institutions establish a system to monitor and prevent money laundering activities and urged banks to segment the market and to implement "know your customer" processes. The goal of these processes was to prevent banks from being used as money laundering channels. According to Hernando Barreto, the officer in charge at that time of the money laundering department within Banco Agrario, the most widespread bank in the country,"...the priority was to raise awareness and clarify to the people what money laundering consisted of, since - I do not know why - the first thing people thought about when the term money laundering was mentioned was in counterfeiting money. They imagined someone washing dollars to extract the ink and thus create new bills. It was something very curious."[12]

In 1999, the Financial Information and Analysis Unit (UIAF) was created. This unit was in charge of centralizing and analyzing the suspicious transaction reports. This was in order to comply with the Financial Action Task Force's (FATF's) requirements that mandate countries to have intelligence units for money laundering activities. However, it was not until 2005 that the UIAF published the first document listing the typology of money laundering activities, whose goal was to educate the parties involved on the behavior and magnitude of these activities. However, the number of reports on potential money laundering cases received by the UIAF in 2005 is strong evidence of the lack of efforts or resources to address the money laundering problem. That year, only 36 reports were received to initiate an investigation.

In response to international pressure, in July 2008 the Superintendencia Financiera de Colombia –the government agency responsible for overseeing financial institutions and regulations– passed the regulatory circular 026, requiring financial institutions implement an Asset Laundering and Terrorist Financing Risk Management System (SARLAFT, after its Spanish acronym). The system would help the supervised entities to manage the risk of being used as instruments to launder money or to channel resources towards the funding of terrorist activities. However, each supervised entity had to develop and perfect its own money laundering prevention system.[13] The goal of the system should be the effective, efficient, and timely knowledge of all customers, compliance with the processes related to international lists of suspicious people, and development of capacity to report suspicious transactions and certain cash transactions to the Financial Information and Analysis Unit

[12]Full interview published in Infolaft magazine, issue 97. Interestingly, the term "money laundering" is said to have originated when organized crime purchased cash-only laundromats and used them as a front-business to hide proceeds from criminal activities. Cash flowing into the laundromats was hard to keep track of, therefore large amounts of money could go through the system unnoticed.

[13]Lack to develop a proper SARLAFT for each financial institution carried a monetary penalty.

(UIAF). Thus, it was not until early 2010 that financial institutions had implemented the system and the regulation had a significant impact, as illustrated by the number of money laundering cases received by the Office of the Prosecutor plotted in Figure II.[14]

While efforts to combat drug production and trafficking do not seem to have had a discernible impact, efforts to deter money laundering seem to have had a significant effect. The Basel Anti-Money Laundering Index attempts to measure countries' risk level in money laundering/terrorist financing; it ranks Colombia amongst the countries with the lowest risk. It is the Latin American country with the highest ranking (lowest risk), and has risk levels comparable to those of Norway and France and lower than those of Germany and the United Kingdom. Unfortunately, the index was first constructed in 2012, therefore there is no information to analyze the effect of the regulation on Colombia's risk of money laundering.

2.4 Colombian Banking Sector

There are four types of financial institutions in Colombia; banks, financial corporations, leasing companies, and financial cooperatives. The banking sector, which is the focus of this paper, is the largest, with more than 86% of total assets in the financial system under control, and consists of a small number of banks. At the beginning of 2008, when the AML policy was sanctioned, there were 16 banks authorized to operate in Colombia, out of which 10 were domestic and 6 were foreign. Another characteristic of the banking sector in Colombia is that it is highly concentrated. The five largest banks - four of which are domestic - control over two-thirds of total assets.

In total, in 2008, there were 4,222 bank branches across 817 municipalities. Table I provides summary statistics for each bank, and Figure III maps the number of bank branches in each municipality, showing a lower presence of banks in the south-east of the country, in the departments of Amazonas, Vaupés, and Guainía, departments that border with Brazil and are slightly populated (less than 0.35% of the total population).

These branches are a key resource for firms. According to the World Bank, the private sector in Colombia ranked among the highest in Latin America in terms of reliance on domestic credit, surpassed only by Chile and Brazil. Its level of dependence on domestic credit is higher than in Argentina, Bolivia, Ecuador, Mexico, Paraguay, Peru, and Uruguay. This characteristic makes a shock to the flow of funds into banks particularly damaging for firms.

[14] The number of cases received by the Office of the Prosecutor declines significantly in 2011. A potential explanation for this is that with intensified controls in the banking sector, money launderers shifted away towards other mechanisms, such as illegal gold mining. Consistent with this, the Office of the Comptroller reported in August 2013 that as of 2011 63% of the entire mining sector was operating illegally, compared to 36% a decade earlier. https://www.contraloria.gov.co/documents/20181/198738/Separata-Mineria-Ilegal.pdf/4d3d5cbe-4bda-430a-831e-ef2f6bbf5d0d?version=1.0, accessed on 7/10/2019.

3 Data

For our study, we merge multiple datasets. Our first database includes information on banks' deposits and loans at the bank-municipality level. These data were provided by the Superintendencia Financiera de Colombia, the governmental agency responsible for overseeing financial institutions and regulations. This information includes the volumes held in different types of deposit accounts (savings, checking, term, etc.) and loans (commercial, mortgages, consumption, microcredit, etc.). We obtain quarterly data for each bank-municipality between 2006:Q1 and 2014:Q4. For each quarter, our dataset includes information on between 1,600 and 2,200 bank-municipality combinations. This number is lower than the total number of branches because our data are at the bank-municipality level, and in large municipalities banks have more than one branch.

Our second database includes Colombian firms' financial statements and was provided by the Superintendencia de Sociedades, the Colombian agency responsible for monitoring firms. We obtain information from 2006 to 2014, and the data for 2007:Q4 are summarized on Table II. For each year, we obtain the balance sheet, income statement, and cash flow statement for reporting firms. Our dataset includes information on more than 20,000 firms.

The third source of data is a proprietary credit registry that includes information on new loans issued and balances outstanding of existing loans. This information is reported quarterly by financial institutions under form 341 and includes the tax ID of the borrower, allowing us to match the data with firms' financial statements. Our fourth database comes from the Department of Labor of Colombia, and includes information at the municipality-year level on the number of firms and employees.

Our fifth source of data includes information on cocaine confiscations at the municipality-year level. These data were provided by the Observatorio de Drogas de Colombia, the governmental agency responsible for the dissemination of information related to drugs and related crimes. Among other type of data, the agency provides yearly information on drug confiscations at the municipality level starting in 1999. The database includes information on seizures of drugs such as cocaine, heroin, and LSD, among others. We focus on cocaine seizures, since the monetary value of production and trade of cocaine in Colombia is orders of magnitude larger than that of any other illicit drug. For instance, in 2008 almost 200,000 kilograms (220.5 tons) of cocaine were seized, but only 645 kilograms (1,422 pounds) of heroin and none of LSD. Table III presents the annual data aggregated at the department level, and Figure IV provides confiscations at the municipality level. Our median municipality has no cocaine confiscations, and about a quarter of the municipalities have confiscations.

The last database provides information on the intensity of artificial lights, used as a proxy of economic activity, which has been frequently used in the literature when reliable data is not

available (for instance, in Henderson et al. (2012) and Chodorow-Reich et al. (2018)). These data are collected by the US Air Force Weather Agency and processed by the National Oceanic and Atmospheric Administration's National Geophysical Data Center. The processing involves the removal of observations for places experiencing the bright half of the lunar cycle, the summer months when the sun sets late, auroral activity, and forest fires, leaving primarily man-made light. We collect these data between 2006 and 2014 and match it with Colombian municipalities using geographic coordinates for each municipality.

4 Methodology and Results

In this section, we describe the methodology we use to study the effect of AML policy on the economy and the corresponding results. We proceed in three steps. First, we test whether controls on the flow of illicit funds into banks had an impact on deposits. We then test whether banks that source their deposits in areas with high levels of illicit drug activity cut lending in other areas in response to the AML policy. Last, we explore the consequences for the real economy looking at firms' financial statements, employment, number of firms, and intensity of artificial light in each municipality after the AML policy.

4.1 Bank Deposits

To study the effect of the AML policy on bank deposit flows, we compare deposits in municipalities with different degree of exposure to illicit activites, before and after SARLAFT. We use data on cocaine confiscations at the municipality level to construct a measure of its exposure to illicit activities. Our assumption is that the volume of cocaine seizures is proportional to the level of drug-related business in a municipality. While data on coca crops are readily available, our preference for data on cocaine seizures is based on the amount of money involved in the different parts of the production process and on the location where this money enters the financial system. The price of fresh coca leaves in 2016 was approximately USD 0.95 per kilogram (USD 0.43 per pound). Once the coca leaves are processed and transformed into cocaine hydrochloride, its price is USD 1,633 per kilogram (USD740.7 per pound) in Colombia, and much higher in countries like the U.S.. This means that with a planted area of 81,000 hectares (200,155 acres) in 2008, the total price of coca leaves produced was approximately USD 370 million. Meanwhile, the price of the 1,379 metric tons of cocaine hydrochloride produced is approximately USD 2.25 billion.

A potential concern is that cocaine confiscations data are affected by selection bias. Confiscations signal the inability of drug lords in that municipality to corrupt the authorities. Thus, municipalities with no confiscations might still have high levels of illicit drug activity, but drug lords find ways of evading the law. Given this, our estimates are likely a lower bound of the effects of AML policies on bank deposits growth. More likely, confiscations can be thought as an implicit

tax on the income generated by drug-related activities that allow authorities to signal commitment and enforceability.[15]

4.1.1 Municipality-level Results

We test whether the AML policy impacted the inflow of deposits as follows.[16] We aggregate deposits across banks at the municipality level for each quarter. We then use a difference-in-differences approach to test whether municipalities in areas with higher exposure to illicit drug activity experience a decline in deposits growth following the regulation. Our baseline empirical specification is as follows:

$$\Delta ln(Deposits)_{m,q} = \alpha_m + \alpha_q + \beta \left(Exposure_m Post_q\right) + \varepsilon_{m,q}, \tag{1}$$

Our dependent variable, $\Delta ln(Deposits)_{m,q}$, is the annual log growth rate of deposits in municipality m in quarter q. $Exposure_m$ is the extent to which a municipality is exposed to illicit drug activity, as measured by cocaine confiscations between 1999 and 2007, the year before the passage of the AML policy. $Post_q$ is a dummy variable set to one in 2010:q1, when enforcement became stricter, and the following quarters. We include two sets of fixed effects: municipality fixed effects (α_m) control for the time-invariant characteristics of deposit growth at the municipality level, and quarter fixed effects (α_q) control for common shocks that affect deposit growth. In alternative specifications, we include department-time fixed effects to control for regional shocks. For robustness, we use alternative measures of exposure, including cocaine confiscations between 2003 and 2007 (Table IV, Panel A) and confiscations normalized by population and GDP at the municipality level, respectively (Table IV, Panel B). Standard errors are clustered at the municipality level.

We find that the AML policy had a significant impact on deposits growth. In particular, we find that municipalities with a higher exposure to illicit activities experience a decline in deposits, relative to municipalities with lower exposure to illicit activities. Interestingly, we find that the effect is not discernible immediately after the introduction of the AML policy. In fact, the timing of the decline in deposits coincides with the sharp increase in money laundering cases received at the prosecutor's office, suggesting that the implementation and enforcement of the AML policy was slow. This is consistent with the fact that the regulator did not provide an AML system, and that each bank had to develop its own, test it, and perfect it. In Figure V, we plot the quarter-by-quarter coefficients, with the first quarter of 2010 set as the time when the enforcement of the law became stricter, as shown in Figure II.

[15] We thank Daniel Rico for this insight.

[16] Throughout the paper we study the inflow of money originated in criminal activities irrespective of the hierarchy of the individual involved in the financial transaction. While it is unlikely that the funds belong to cartel leaders –since they have other means to launder money– they might belong to local drug lords or intermediaries such as carriers or sales people.

The results presented in Table IV show that municipalities with higher levels of exposure to illicit drug activity experience a decline in deposits after the AML policy. In specifications in columns (1)-(3) we use data on cocaine confiscations from 1999 to 2007 to measure exposure, and in columns (4)-(6) we use data on confiscations from 2003 to 2007 for robustness purposes. The coefficients in column (1) show that municipalities with a higher exposure to illicit drug activity experience a large decline in deposits after the AML policy was enforced. More specifically, a one standard deviation (0.75) increase in exposure to illicit drug activities translates into a 1.2 percentage points (0.016 x 0.75) lower growth in deposits post-regulation - or a 12.4% decrease over its baseline pre-AML policy level of 9.5%. This result is very similar after the inclusion of time and municipality fixed effects (column (2)) and municipality and department-time fixed effects (column (3)). The results in columns (4)-(6) are economically and statistically similar. When we scale the number of confiscations by municipality-level population (columns (1)-(3) in Panel B) and GDP (columns (4)-(6) in Panel B) we find similar results.[17][18]

For robustness, we perform four additional tests. First, we perform a similar test using deposits levels instead of growth and find similar results, as shown in the Appendix Table A1. Second, since some banks might have implemented SARLAFT faster than others, we repeat the analysis using the timing of the passage of the regulation (2008:q3) and find almost identical results, reported in Table A2.[19] Third, to mitigate concerns that our measure of confiscations might be biased due to corruption at the local police level, we repeat the study using exclusively confiscations by the national military forces of Colombia, which are less prone to local corruption.[20] The results presented in Table A3 are similar to those found using confiscations by both local and federal authorities. Fourth, we repeat our analysis by randomly reallocating exposure to cocaine across municipalities. We repeat this placebo test one thousand times and record the t-stats obtained for our main coefficient of interest. The results we obtain allow us to rule out spurious correlations between measures of exposure and deposits growth (Figure A1).

4.1.2 Bank-level Results

Having shown that aggregate deposits at the municipality level decrease in areas exposed to illicit drugs trafficking after the regulation, we now turn into bank-municipality level deposits. The richness of our data allows us to analyze whether our results are driven by certain banks and not

[17] Interestingly, the coefficient on *Post* in columns (1) and (4) is positive and significant. While we cannot explicitly attribute this growth to the AML policy due to other simultaneous events at the country level, it might be argued that the AML policy had a positive overall effect on deposits by, for instance, improving the reputation of banks.

[18] A potential concern is that the areas where the criminals operate are larger than the municipalities we identify as exposed to illicit activities using the confiscations data. In this case, following the regulation deposits would decline not only in the municipalities we identified but also in neighboring municipalities, biasing our results. While this is plausible, such an effect would bias the estimated coefficients downwards.

[19] The main results use the timing of the stricter enforcement of the regulation, 2010:q1.

[20] We thank Murillo Campello for this suggestion.

others. With this in mind, we test two hypothesis. First, that foreign banks were already subject to stricter scrutiny in terms of money laundering, and that our results are driven by domestic banks. Second, that the results are driven by branches in remote municipalities where private banks do not operate.

We start by replicating our results with bank-municipality data in Table V, where we include an additional set of fixed effects to control for shocks at the bank-quarter level. Columns (1) and (2) replicate our prior tests and obtain similar coefficients than those in Table IV. In columns (3) and (4) we include an indicator for foreign banks and test whether these banks behave differently. We do not find this to be the case, with the coefficient for the triple interaction term being indistinguishable from zero. In columns (5) and (6) we repeat the analysis excluding those municipalities where there is no presence of private banks and only Banco Agrario de Colombia –a state bank with the most widespread presence in Colombia– operates. We find similar results, suggesting that our results are not driven exclusively by state-owned banks.

4.1.3 Additional Evidence on Deposits

There are two alternative explanations for our results that merit some attention. First, they might reflect a shift in locations as to where illicit drug money enter banks and not a decline in the volume. For instance, income from illicit activities could be deposited in areas with weaker enforcement of the AML policy. In this case, the results in Table IV would reflect a relocation rather than a decrease in flows into the financial system.[21] Second, there is the possibility that the decline in deposits is not due to money laundering, but to legal money. For example, if there is a decline in drug-related businesses due to the AML policy and this affects economic activity, people might move from municipalities with high cocaine activity to those with low activity. In turn, this could lead to differential deposit growth. To rule out these concerns, we focus on the second stage of the money laundering process, *layering*. After the *placement* stage, when the funds enter the financial system, criminals transfer funds between jurisdictions to create additional layers between the funds and the underlying activity that generated them.

To test whether our results capture a shift of locations, we focus on the aggregate volume of money flowing to foreign jurisdictions typically used to launder money. We obtain data on cross-country claims by Colombian residents from the Bank for International Settlements. The quarterly data include the volume of claims by Colombian residents reported by 30 counterparties, which allows us to measure the effect of the AML policy on cross-country flows. We use the Basel AML Index to identify jurisdictions with a higher risk of being used to launder money and test whether there is a differential effect of the regulation on claims in these countries, vis-à-vis countries with

[21] Notice that this would be a violation of the Stable Unit Treatment Value Assumption (SUTVA) in our difference-in-difference model since municipalities that act as a control group would be positively affected by the treatment.

lower risk. This index was developed by the Basel Institute on Governance and weighs heavily on three aspects: the FATF Mutual Evaluation Reports, the Financial Secrecy Index, and the US State Department International Narcotics Control Strategy Report. Our specification is:

$$ln(Claims)_{c,q} = \alpha_q + \alpha_c + \beta_1 High\ Risk_c \times Post_q + \varepsilon_{c,q}, \tag{2}$$

Our dependent variable is the volume (logged) of claims owned by Colombian residents in country or jurisdiction c and quarter q. $High\ Risk_c$ is an indicator variable set to one for Guernsey, Isle of Man, Jersey, Luxembourg and Switzerland, jurisdictions with a high risk of being used for money laundering. $Post_q$ is an indicator variable set to one from 2010 onwards. We include quarter and country fixed effects to absorb common shocks and country-specific characteristics.

The results in the first column of Table VI show that following the enforcement of the AML policy, claims in high-risk countries decline by approximately 37% relative to those in low-risk countries, suggesting that our results do not reflect a relocation of money laundering activity within Colombia but to an actual decrease in its volume. To mitigate the concern that our results are driven by jurisdictions with a low volume of claims, we aggregate the volume of claims in high(low) risk jurisdictions and repeat the analysis with aggregate volumes. Thus, our specification is now:

$$ln(Claims)_{R,q} = \alpha_q + \beta_1 High\ Risk_R + \beta_2 High\ Risk_R \times Post_q + \varepsilon_{R,q}, \tag{3}$$

We find that the results in the second column of Table VI show similar patterns. The coefficient on $High\ Risk_R$ shows that the aggregate volume of claims in these jurisdictions is smaller than in jurisdictions with lower risk. More importantly, the coefficient on the interaction term shows that following the enforcement of the AML policy, claims in these jurisdictions decreased by 32% relative to those in jurisdictions with lower risk of being used to launder money. These results suggest that the AML policy was effective.

4.2 Bank Lending

We next test whether the drop in deposits affected banks' lending. A potential concern is that the AML policy can simultaneously affect demand for loans by firms in affected municipalities. For instance, the policy likely reduces incentives to engage in criminal activity, affecting local employment and consumption and reducing the demand for firms' products, which would in turn reduce credit demand. In order to mitigate the concern of potential confounding effects due to changes in credit, we exploit banks' branch networks and focus our analysis on municipalities with low or nil levels of illicit drug activity.

Our identification strategy is based on comparing loan growth within a municipality by banks

with different levels of exposure to the AML policy. We construct a measure of the 2007 pre-AML policy exposure to illicit funds at the bank level. This measure indicates the percentage of deposits sourced from municipalities with high levels of illicit drug activity relative to the total deposits for each bank, and is measured as follows:

$$Exposure_b = \frac{\sum_{m=1}^{M} Deposits_{b,m} I_m}{\sum_{m=1}^{M} Deposits_{b,m}}, \tag{4}$$

where M is the number of municipalities in which the bank operates, $Deposits_{b,m}$ is the volume of deposits in bank b and municipality m, and I_m is a proxy of whether municipality m is exposed to illegal drugs activity. More specifically, I_m is equal to one if the volume of cocaine confiscations is in the top quartile across municipalities. Thus, our measure captures the percentage of deposits in Bank b that are sourced from affected municipalities. For the banks in our study, exposure ranges from 42.43% to 100%.

Next, we test whether the decline in deposits affected lending to firms in municipalities not directly exposed to illicit drugs activities. We do so with the following difference-in-differences specification:

$$\Delta ln(Loans)_{m,b,q} = \alpha_b + \alpha_{m,q} + \beta \left(Exposure_b Post_q\right) + \varepsilon_{m,b,q} \tag{5}$$

Our dependent variable is the log growth of new commercial loans (volume) granted by bank b in municipality m in quarter q. $Exposure_b$ is a measure of the extent to which a bank draws its deposits from municipalities with high levels of illicit drug activity, as measured in equation (4). We include two sets of fixed effects. Municipality-quarter fixed effect ($\alpha_{m,q}$) control for shocks at the municipality level that might affect loan demand. Bank fixed effects (α_b) control for the time- invariant characteristics of the loans issued by a bank. Standard errors are clustered at the municipality level. Notably, this specification allows us to control for local demand shocks and identify the effect of the funding gap on lending. In addition, to address potential confounding effects from changes in credit demand in municipalities directly exposed to illicit activities, we focus on municipalities not directly exposed to the AML policy (i.e. those with low or nil levels of cocaine confiscations).

For the results to be meaningful, we make two assumptions. First, we follow Bustos et al. (2017), and assume that due to interbank market imperfections, banks fund part of their lending operations with their own deposits. Second, we assume that banks operate an internal capital market (i.e. funds raised in one municipality can be used to issue loans in another municipality). In our context, this is a crucial assumption, since it would transfer the shock from affected to non-affected municipalities. While this notion is consistent with findings by Gilje et al. (2016)

and Ben-David et al. (2017) for the U.S. market, we study the validity of this assumption for the Colombian market by creating a loan-deposit ratio at the bank-municipality level at the end of 2007. Without internal markets - and ignoring reserve requirements - this ratio should be one or less for all bank-municipalities. Table VII presents evidence that some municipalities are net providers of funds (those with loan-deposit ratios below one) and that some are net receivers of funds (those with loan-deposit ratios above one). In some cases, the differences are stark. For instance, Banco Agrario de Colombia, the bank with the most widespread presence in Colombia, has municipalities that are pure sources of funds (loan-deposit ratios are zero), while branches in other municipalities are net receivers, with coefficients close to 9. To provide a graphical representation, Figure VI is a map of the distribution of net receivers and net providers of funds for Banco Agrario de Colombia at the end of 2007. This evidence suggests that there is a functioning internal capital market within banks.

Table VIII presents the results of our test of the effect of the AML policy on bank lending. Banks with higher exposure to illicit drug activity reduce lending in non-directly exposed municipalities. In particular, the results in column (1) show that an increase of one standard deviation (0.14) in a bank's exposure is associated with a decline in post-policy credit growth of 5.3 percentage points (0.383 x 0.14). When we include time fixed effects in the regression, the results do not change significantly as shown in column (2). In addition, the results are robust to the inclusion of municipality-quarter fixed effects (column (3)). The results in column (3) show that, within a municipality, banks with a one standard deviation higher exposure to illicit drug activity experience a 9.5 percentage point decline in credit growth relative to other banks.[22]

Figure VII plots the quarter-by-quarter coefficients from our estimation framework. This figure shows that previous to the enforcement of the AML policy, there was no differential prior trends in credit growth. Moreover, we find that the timing of the effect coincides with the decline in deposits in areas with higher illicit drug activity triggered by the stricter enforcement of SARLAFT. Interestingly, the Figures show a contrast between the short and long run effects of the AML policy, with the effect on deposits and on bank lending lasting between 4 and 8 quarters, and disappear afterwards.

4.2.1 Credit Supply or Credit Demand?

One potential concern with our specification is that the effect we are capturing is due to changes in demand for credit and does not respond to a decline in credit supplied by banks. In column (3) of Table VIII we include municipality-quarter fixed effects to control for this. These fixed effects capture the average growth in commercial credit within each municipality and each quarter. Under

[22] In unreported results, we find that banks more exposed to the AML policy experience a decline in profitability following the enforcement of the policy, relative to less exposed banks. This is consistent with more exposed banks being hurt due to the reduced funding and consequent contraction in credit.

the assumption that credit demand varies equally across banks, these fixed effects would absorb changes in demand for credit. As described above, our results are robust to the inclusion of these fixed effects. However, it might be the case that we are not capturing all unobservables related to credit demand, and that our results suffer from omitted variable bias. Altonji et al. (2005) and Oster (2019) suggest that a potential omitted variable bias can be analyzed by looking at how the R-squared and estimated coefficients change due to the introduction of observable controls.[23] In our framework, we introduce observable controls that proxy for time-varying credit demand at the municipality level. When we compare the results in column (3) to those in column (1), we find that introducing fixed effects at the municipality-time level increases the R-squared from 9.2% to 37%, a fourfold increase. Despite that, the coefficient in column (3) is relatively similar and within the confidence interval of that in column (1); if anything, the coefficient in column (3) is slightly larger (in absolute terms). This suggests that the estimated effect we document is unlikely due to changes in credit demand at the municipality level.

4.3 Consequences for the Real Economy

In this subsection we analyze the effects of the negative credit supply shock on the real economy. We start by analyzing firm-level outcomes and then study aggregate effects such as number of firms, employment, and real economic activity, including both formal and informal.

4.3.1 Firms' Financial Statements

We study firms' outcomes and test whether the negative liquidity shocks for banks and the consequent negative credit supply shock affected firms' growth. To test this, we exploit a proprietary database that includes all the loans issued to firms by all the banks in Colombia, during the period 2006-2014.[24] We match this with the financial statements of firms in Colombia. After the matching, we end up with 2,143 firms with relationship with at least one bank.

Our empirical strategy relies on firms' differential access to financing, where the source of variation comes from the differential exposure to the AML policy of the banks each firm borrows from. For instance, two otherwise identical firms operating in the same industry and municipality might have relationships with different banks, therefore their access to financing might differ after the AML policy and impact their outcomes. Using our proprietary data of loans at the bank-firm level, we construct a firm-level measure of indirect exposure to the policy by looking at the exposure of the banks the firm borrows from. Thus, we calculate pre-policy indirect exposure (IE) as follows:

$$IE_f = \frac{\sum_{b=1}^{B} \text{Commercial Loans}_{b,f} Exposure_b}{\sum_{b=1}^{B} \text{Commercial Loans}_{b,f}}, \tag{6}$$

[23] See Williams (2018) for an application of this method to analyze the effects of credit supply and credit demand.
[24] Our results are robust to using alternative time periods.

where B is the number of banks that lend to firm f, Commercial Loans$_{b,f}$ is the size of loans of bank b to firm f at the end of 2007, and $Exposure_b$ is our bank-level measure calculated in equation (4). Thus, our measure captures the share in a firm's credit portfolio that each bank has, as well as the exposure of each bank to the negative liquidity shock.

For clarity, we provide a simplified example. Suppose that there are only two banks in Colombia, Bank A and Bank B. Bank A (B) sources 80% (30%) of its deposits from municipalities exposed to illegal drug activity. Now consider three firms, X, Y, and Z, that are not directly exposed to illegal drug activity (i.e., they operate in municipalities with no cocaine confiscations between 1999 and 2007). Firm X borrows exclusively from Bank A. Thus, the indirect exposure of firm X is 80% (1 x 0.8). Firm Y borrows exclusively from Bank B. Thus, the indirect exposure of firm Y is 30% (1 x 0.3). Firm Z borrows from both banks in equal amounts, therefore the indirect exposure of firm Z is 55% (0.5 x 0.3 + 0.5 x 0.8). This example shows that, even though these three firms are not exposed to the AML policy directly, they are indirectly affected via internal capital market of the banks and their negative liquidity shock.

Our specification to test the effect of AML policies on firms' outcomes is as follows:

$$\begin{aligned} y_{f,m,i,t} = \alpha_f + \alpha_{i,t} + \alpha_{m,t} + \beta_1 \times Post_t \times IE_f + \beta_2 \times Post_t \times Small_f + \\ \beta_3 \times Post_t \times Small_f \times IE_f + \gamma_{f,t-1} + \varepsilon_{f,m,i,t}, \end{aligned} \tag{7}$$

where $y_{f,m,i,t}$ is one of our outcome variables for firm f in municipality m, operating in industry i at time t. IE_f is the measure of exposure calculated in equation (6), $Post_t$ is an indicator variable that is set to one starting in year 2010, when enforcement of the AML policy became strict, and $Small_f$ is an indicator variable for firms below the median in terms of sales within each municipality at the end of 2007. We include firm (α_f) fixed effects, industry-time ($\alpha_{i,t}$) fixed effects, and municipality-time ($\alpha_{m,t}$) fixed effects, to control for shocks to each particular industry, shocks to each municipality, and firm unobservable characteristics, respectively. We also include firm-level controls ($\gamma_{f,t-1}$) such as size and profitability, and we cluster standard errors at the firm level. In an alternative specification, we include industry-municipality-year ($\alpha_{m,i,t}$) fixed effects.

This specification allows us to compare outcomes of firms within a municipality that operate in the same industry, but that rely on credit from different banks. In addition, it allows us to test heterogeneous effects on firms of different sizes. Arguably, the effect on small firms might be larger, since small firms are usually more financially constrained. Thus, they might face larger difficulties to substitute bank credit. Our coefficients of interest are β_1 and β_3, which measure the effect of the negative credit supply shock on firms with higher indirect exposure to the AML policy and the differential effect on small firms with higher indirect exposure to the AML policy, respectively. As

before, to address potential confounding effects, we focus on municipalities not directly exposed by the policy.

The results in Table IX show that following the decline in deposits in municipalities affected by illicit drug activity, small firms indirectly affected experience worsening business outcomes. The results in Panel A indicate that a one standard deviation increase in indirect exposure to the credit supply shock (0.065) for small firms is associated with a 9.3% (-1.432 x 0.065) larger decline in sales, a 6.5% larger decline in cash holdings (although not significant at the 10% level), a 10% larger decline in property, plant, and equipment, a 3.4% larger decline in total assets, a 24.3% larger decline in the level of financial debt, and a 2.5% larger decline in net profit. In contrast, we find no effect on large firms. When we include industry-municipality-year fixed effects the results remain practically unchanged, as shown in Panel B.

A potential concern is that our results are affected by a violation of the Stable Unit Treatment Value Assumption (Rubin (1980)). For instance, if criminals import goods from municipalities with little or nil drug trafficking activity, the regulation would have a negative effect on these municipalities not only via a credit supply shock but also via a shock to demand. To provide further evidence that our results respond to the credit supply shock, we split firms in our sample into those in the tradable and non-tradable sectors.[25] In response to an import demand shock, firms in the tradable sector should be more affected than those in the non-tradable sector. We test this by including an indicator ($Tradable$) that is set to one for firms in the CIIU categories A to D and interact it with the terms in specification 7. The results in Table A4 show that firms in the tradable sector did not experience a different shock than those in the non-tradable sector, suggesting that our results are not driven mainly by an import demand shock.

4.3.2 Employment and Number of Firms

In this subsection we examine the effect of the negative credit supply shock on the aggregate employment and the number of firms. Our empirical strategy relies on differential exposure to the AML policy driven by differences in the composition of the banking market across municipalities. For each municipality, we create a measure of indirect exposure to the policy by looking at the loan market shares of banks operating within the municipality, as well as the degree of exposure of each bank. Thus, we calculate indirect exposure at the municipality level at the end of 2007 as follows:

$$IE_m = \frac{\sum_{b=1}^{B} \text{Commercial Loans}_{b,m} Exposure_b}{\sum_{b=1}^{B} \text{Commercial Loans}_{b,m}}, \tag{8}$$

where B is the number of banks that operate in municipality m, $\text{Commercial Loans}_{b,m}$ is the volume

[25] In our prior specification a shock to demand would be absorbed by our industry-year or industry-municipality-year fixed effects, thus our results responded to the credit supply shock net of any potential demand shock.

of the portfolio of commercial loans of bank b in municipality m, and Exposure Bank$_b$ is our bank-level measure calculated in equation (4). Thus, our measure captures the exposure of each bank to the AML policy and its market share within each municipality.

We obtain data on employment and number of firms from the Colombian Department of Labor. A key difference with the data used in the previous section is that financial statements are available only for firms with value of assets above an amount equivalent to 30,000 monthly minimum wages. In this section, we use data on employment and number of firms for the universe of registered firms. While these data are at the municipality level, data on employment are disaggregated into firm-size buckets, allowing us to study the heterogeneous effect on firms of different sizes. Unfortunately, the Department of Labor started publishing the data in 2009, therefore we have only one year of data before the AML policy was effectively enforced.

We first test the effect of the contraction of credit supply on employment at the municipality level. Our empirical specification to test the effect of the AML policy on employment is as follows:

$$\Delta ln(Employment)_{m,d} = \alpha_d + \beta_1 IE_m + \varepsilon_{m,d}, \tag{9}$$

where $\Delta ln(Employment)_{m,d}$ is the annual log growth rate in the number of employees between 2009 and 2010 in municipality m, department d. IE_m is our measure of indirect exposure calculated in equation (8). We include department fixed effects to control for regional shocks and we cluster standard errors at the department level. As before, we focus on municipalities not directly impacted by the policy.

We run the analysis separately for employment growth on small firms (less than 51 employees) and on large firms (51 or more employees). The results in Panel A of Table X show that a one standard deviation increase in a municipality's exposure to the AML policy (0.17) is associated with a 7% larger decline in employment growth in small firms (column (1)) but has no discernible effect on employment growth in large firms. In order to rule out spurious correlation, we run the same analysis for consequent years and find no effect in Panel B.

Last, we test the effect of the credit supply shock on the number of firms in each municipality. Our specification to test the effect of the AML policy on the number of firms is as follows:

$$\Delta ln(Firms)_{m,d} = \alpha_d + \beta_1 IE_m + \varepsilon_{m,d}, \tag{10}$$

where $\Delta ln(Firms)_{m,d}$ is the annual log growth rate in the number of firms between 2009 and 2010 in municipality m, department d. IE_m is our measure of indirect exposure, which quantifies the degree to which a municipality is indirectly affected by the funding gap via the composition of

banks that operate within the municipality as measured in equation (8). We include department fixed effects to control for regional shocks and we cluster standard errors at the department level. As before, we focus on municipalities not directly impacted by the policy.

Since the Department of Labor does not provide data for different firm sizes, we run this analysis for the total number of firms. The results in Panel A of Table XI show that a one standard deviation increase in a municipality's exposure to the AML policy (0.17) is associated with a 2.1 percentage points larger decline in the number of firms in a municipality. We run the same analysis for consequent years and find mostly no effect in Panel B.

4.3.3 Real Economic Activity

An alternative explanation that is consistent with our results on employment and number of firms is that there is a shift away from the formal economy into the informal sector. To rule out this alternative explanation, we proxy real economic activity –including the informal sector– by studying satellite night lights, an approach used frequently in the literature when reliable data is not available.

We use data provided by the National Oceanic and Atmospheric Administration's National Geophysical Data Center. We collect data between 2006 and 2014 and match it with Colombian municipalities using geographic coordinates for each municipality. For each municipality-year, we aggregate the data to obtain a measure of intensity of man-made light and match it with our measure of indirect exposure at the municipality level as calculated in Equation 8.

We test the effect of the credit supply shock on real economic activity using the following specification:

$$\ln(Nightlights)_{m,d,t} = \alpha_m + \alpha_{d,t} + \beta_1 Post_t \times IE_m + \varepsilon_{m,d,t}, \tag{11}$$

where $\ln(Nightlights)_{m,d,t}$ is the log intensity of nightlights in municipality m, department d, in year t. IE_m is our measure of indirect exposure, which quantifies the degree to which a municipality is indirectly affected by the funding gap via the composition of banks that operate within the municipality as measured in equation (8). We include municipality fixed effects (α_m) to control for time-invariant characteristics of nightlights at the municipality level and department-time fixed effects ($\alpha_{d,t}$) to control for regional shocks. We cluster standard errors at the department level and, as before, we focus on municipalities not directly impacted by the policy.

The results in Table XII show that the credit supply shock had a real economic effect on affected municipalities. In particular, a one standard deviation increase in a municipality's exposure to the AML policy (0.17) is associated with an 8.5 percent decrease in nightlights intensity. Taken

together, the findings in this section show that our results do not respond to a reallocation of economic activity across firms or to a shift away from the formal economy, but to a significant decline in real economic activity.

5 Conclusion

In this paper, we document a hidden cost of AML policies by analyzing the introduction of a policy in Colombia aimed at controlling the flow of money from drug trafficking into the financial system. In particular, we show that controls on money laundering had a negative effect on employment and firms' outcomes by reducing available funding. Our identification at the bank level –for both deposits and loans– relies on difference-in-difference estimations based on heterogeneous geographic exposure to funds from illicit drug activities. We find a drop in bank deposits in municipalities exposed to illicit drug activities, as proxied by cocaine confiscations. We also find that banks that source their deposits in these areas reduce lending in municipalities not directly affected by the policy. Last, we show that the reduction in lending had a significant negative effect on the real economy. Small firms reliant on affected banks experienced a negative shock in terms of assets, investment, profitability, and sales. In addition, municipalities indirectly exposed to the policy experienced a decline in number of firms, employment growth in small firms, and economic activity.

To the best of our knowledge, this is the first paper to empirically identify and measure the potential negative repercussions of the fight against money laundering on the real economy. This finding has important implications for policymakers, especially those in countries where illegal activity is intrinsically embedded in the formal and informal economy. More specifically, our findings suggest that the implementation of AML policies should be accompanied by expansionary liquidity policies to reduce the negative short-term liquidity shock to the financial system, which could in turn have long-term negative effects on the real economy.

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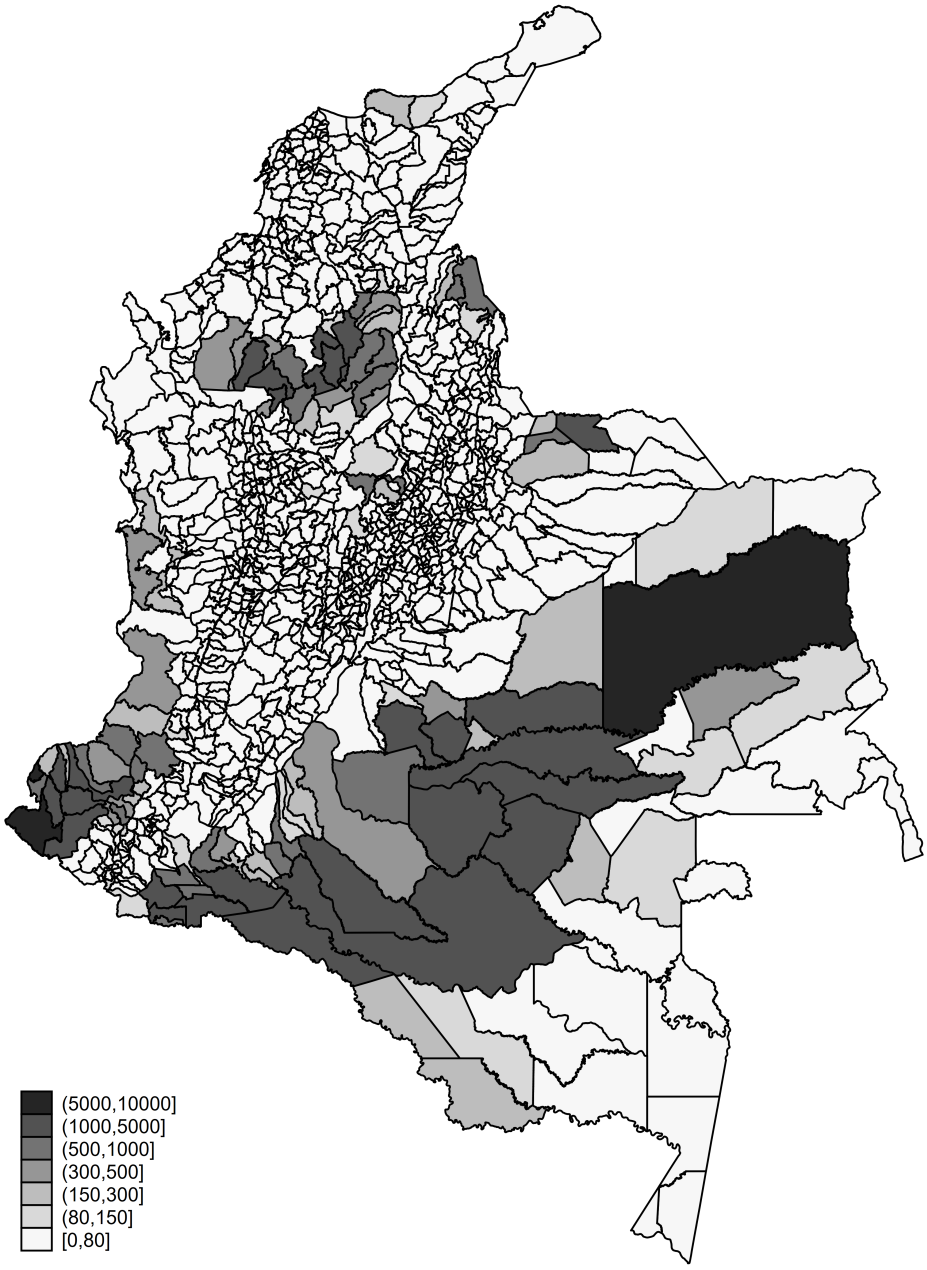
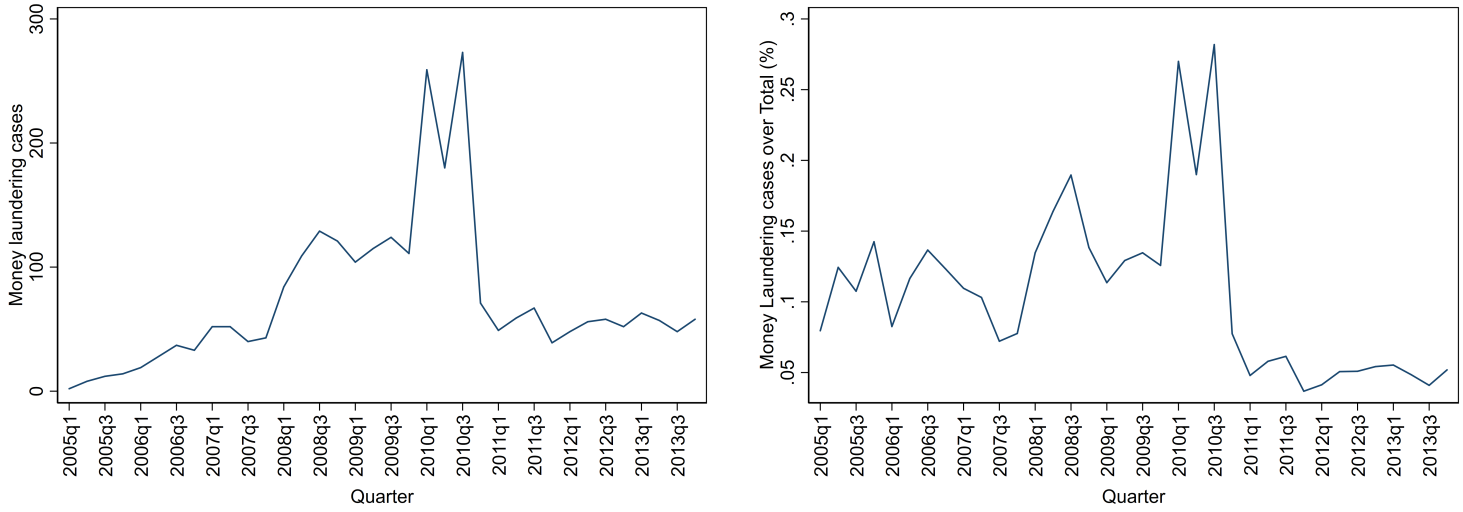
Figure I: Cultivation of Coca



This figure shows the territories affected by crops of coca leaves, as measured by the volume of hectares dedicated to the growth of coca as of 2007. Data are obtained from the "Survey of Territories Affected by Illicit Crops" published by the United Nations Office on Drugs and Crime.

Figure II: Money Laundering Cases

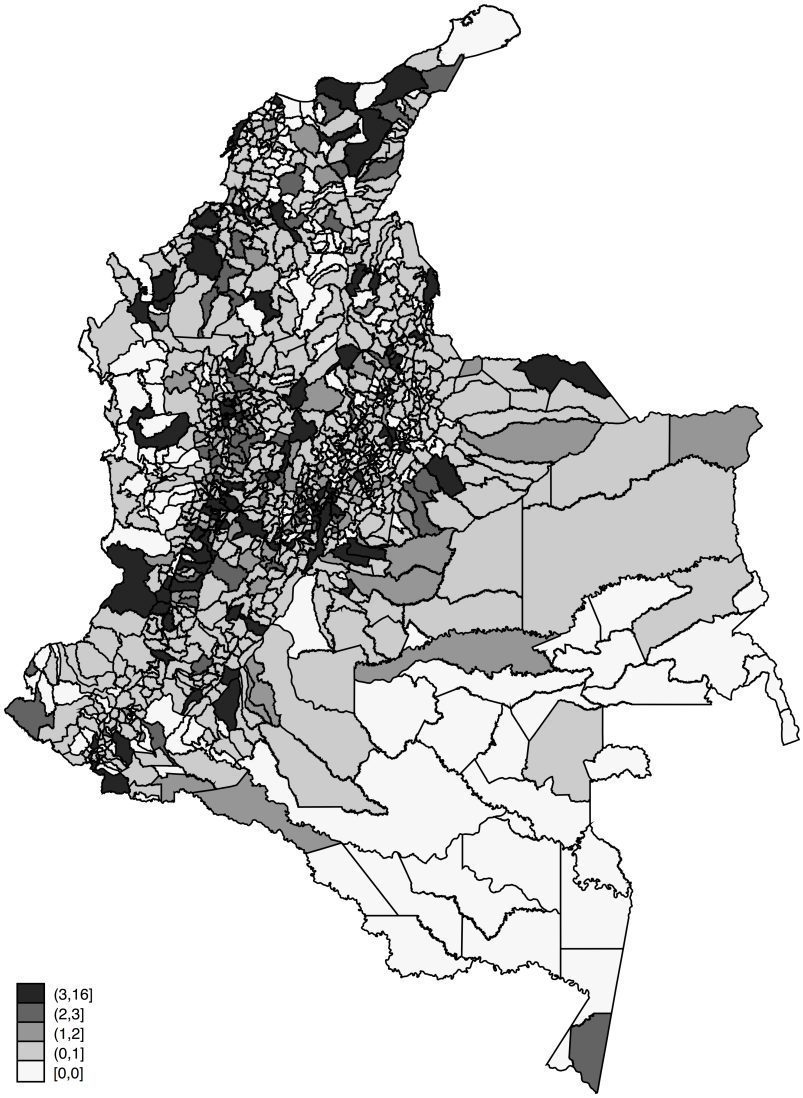


Panel A

Panel B

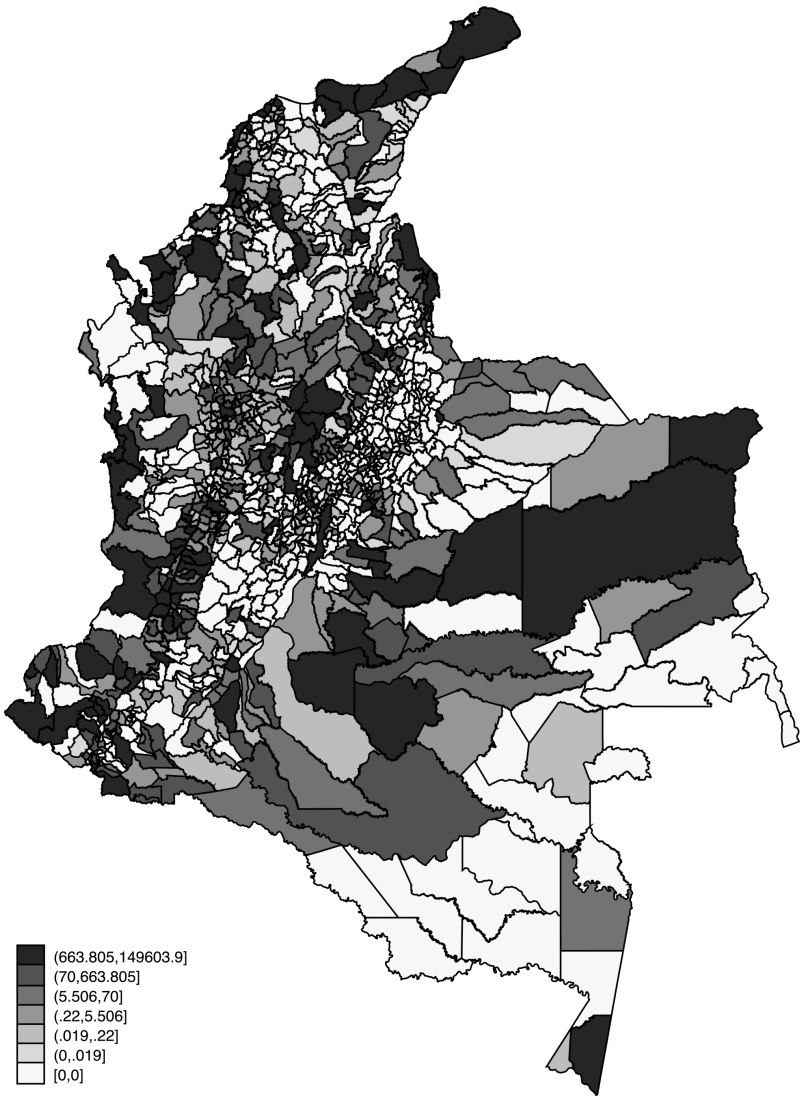
This figure shows the number of money laundering cases received by the Office of the Prosecutor between 2005 and 2013. Panel A plots the raw number of cases, on a quarterly basis. Panel B plots the percentage of money laundering cases over total number of cases received by the Office of the Prosecutor. Data are from the Office of the Prosecutor.

Figure III: Presence of Banks across Colombian Municipalities



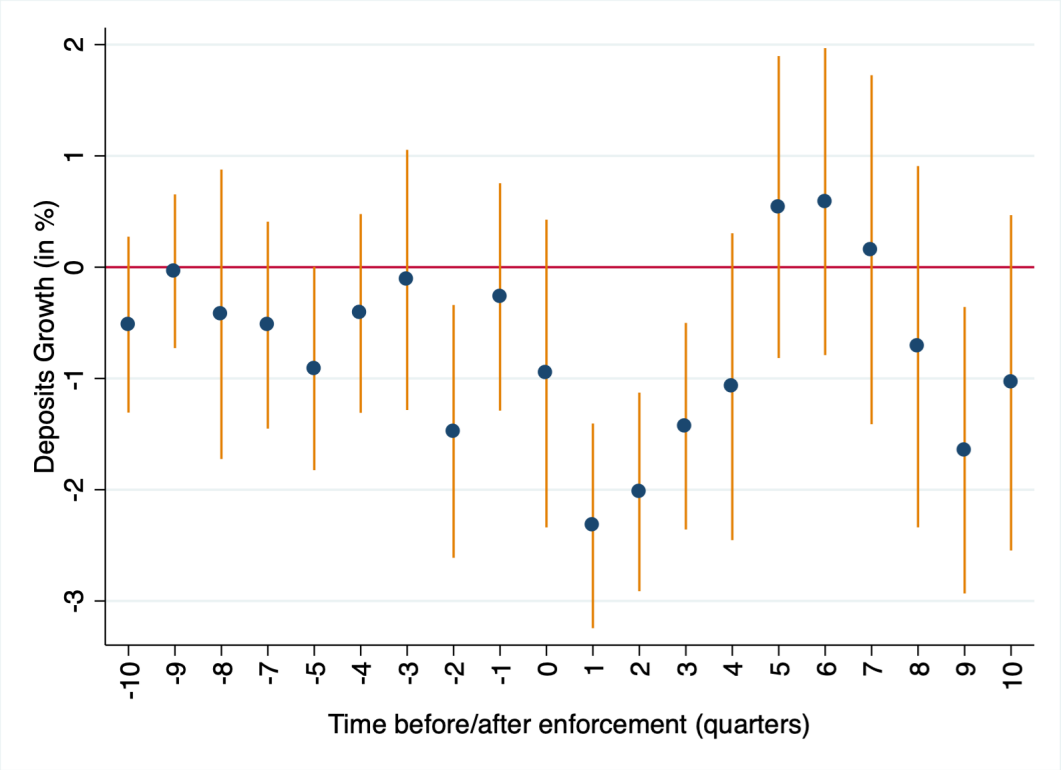
This figure shows the number of banks that operated within each Colombian municipality as of the end of 2007. Data are from the Superintendencia Financiera de Colombia, the Colombian government agency responsible for overseeing financial institutions.

Figure IV: Confiscations of Cocaine



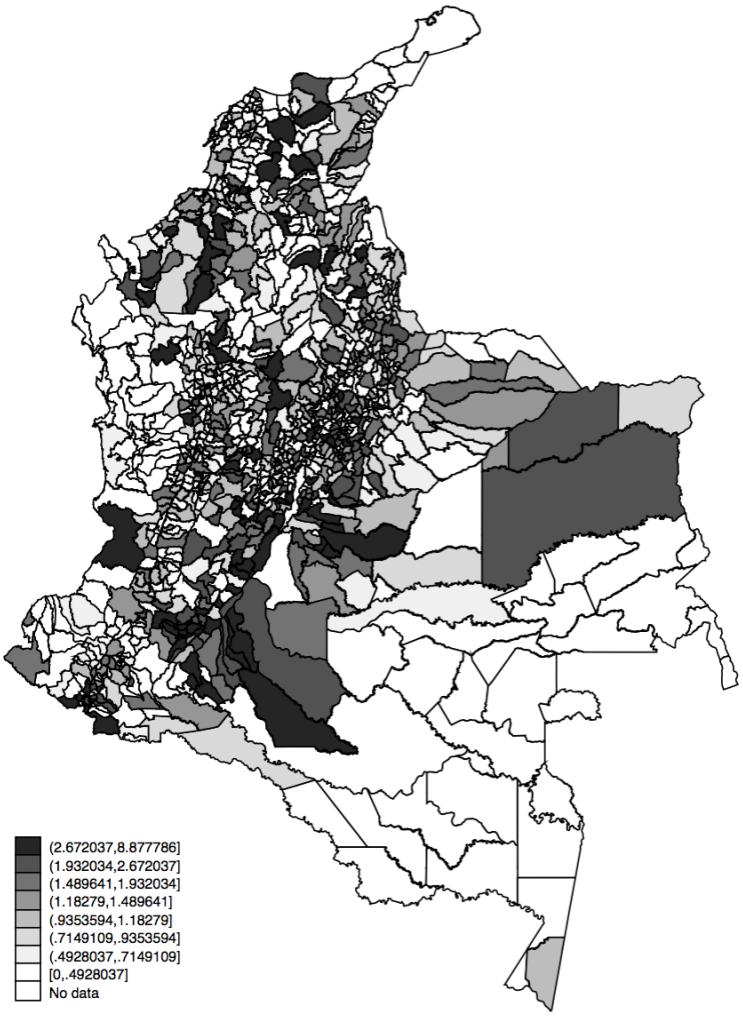
This figure shows the volume (in kilograms) of cocaine hydrochloride confiscated by the Colombian authorities between 1999 and 2007 on each Colombian municipality. Data are from the Colombia's Drug Observatory.

Figure V: Deposits Growth and Confiscations



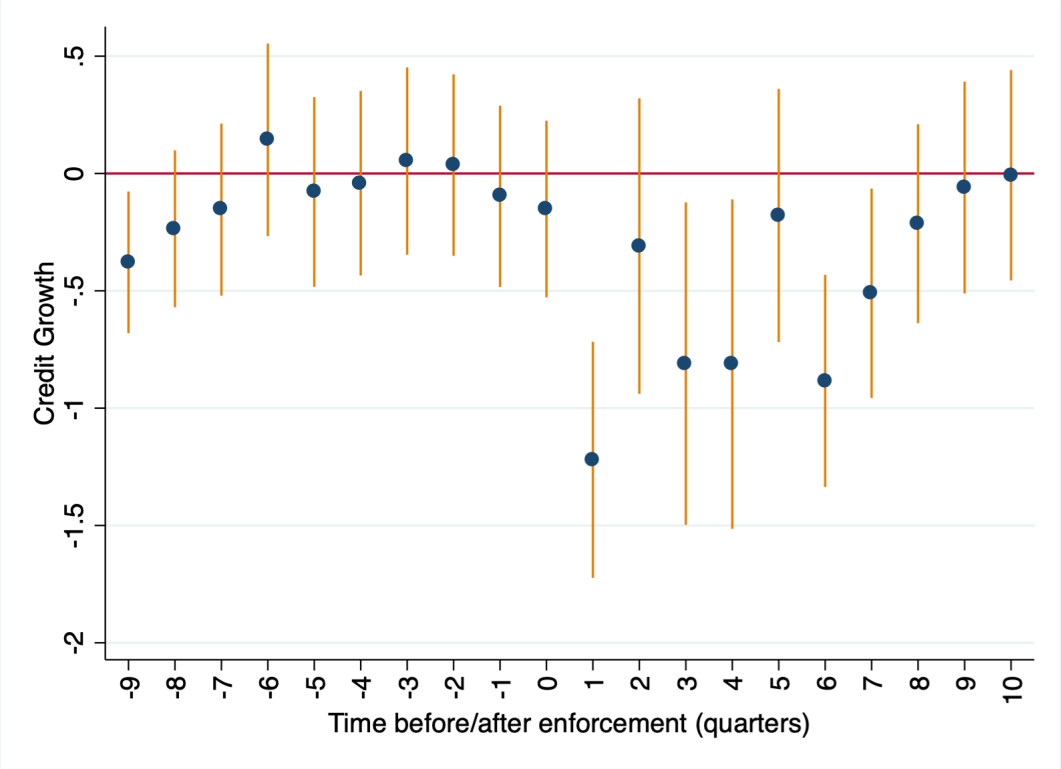
This figure shows the quarter-by-quarter coefficients from a regression estimation of deposits growth on the exposure to illicit drugs activity at the municipality level. Vertical bars represent confidence intervals at the 95% level. The period 0 is 2010q1, the peak of anti-money laundering cases processed by the Office of the Attorney General. Data on deposits are from the Superintendencia Financiera de Colombia, the Colombian government agency responsible for overseeing financial institutions. Data on confiscations are from the agency responsible for the dissemination of information related to drugs.

Figure VI: Banks' Internal Capital Markets



This figure shows the variation across municipalities in the loan-deposit ratio for Banco Agrario de Colombia at the end of 2007. Municipalities with ratios below one are net providers of funds, while those with ratios above one are net receivers of funds. Data are from the Superintendencia Financiera de Colombia, the Colombian government agency responsible for overseeing financial institutions.

Figure VII: Credit Growth and Bank Exposure



This figure shows the quarter-by-quarter coefficients from regressing commercial credit growth on bank exposure. The bank exposure variable is the percentage of deposits in a given bank that is sourced from municipalities with cocaine confiscations in the top quartile across municipalities. The red bar represents confidence intervals at the 95% level. The period 0 is 2010q1, the peak of anti-money laundering cases processed by the Office of the Attorney General. Data on deposits are from the Superintendencia Financiera de Colombia, the Colombian government agency responsible for overseeing financial institutions. Data on confiscations are from the agency responsible for the dissemination of information related to drugs.

Table I: Summary Statistics - Banks

Bank	Municipalities	Deposits (billion COP)
Banco Agrario	710	3,950.22
Bancolombia	167	21,750.72
Banco de Bogota	158	14,454.03
Davivienda	147	14,440.39
BBVA Colombia	92	13,975.67
Banco Popular	80	6,001.42
Banco Caja Social BCSC	62	5,205.74
AV Villas	49	3,687.21
Banco de Occidente	40	8,232.59
Red Multibanca Colpatria	28	4,219.32
Banco Santander Colombia	22	2,956.45
Banco de Credito	13	3,282.43
Banco GNB Sudameris	12	2,676.93
Citibank	10	3,999.15
Banistmo Colombia	10	1,479.02
ABN AMRO Bank Colombia	4	324.61

This table shows summary statistics for the banks operating in Colombia as of the fourth quarter of 2007. The second column indicates the number of municipalities in which the bank has presence through a physical branch. The third column reports the total volume of deposits. Data are from the Superintendencia Financiera de Colombia, the Colombian government agency responsible for overseeing financial institutions.

Table II: Summary Statistics - Firms

Firm-level Summary Statistics						
	Observations	Mean	SD	p25	Median	p75
Cash	21,734	43.94	139.84	0.30	2.42	19.21
PPE	21,734	1,737.49	5,516.73	45.65	243.40	941.11
Sales	21,734	11,023.37	30,134.20	455.52	1,903.21	7,343.61
Leverage	21,721	0.51	0.30	0.28	0.52	0.72
Net Profit	20,248	0.03	0.44	0.01	0.03	0.07
Gross Profit	20,248	0.43	0.33	0.19	0.33	0.63

This table shows summary statistics for the firms operating in Colombia as of the fourth quarter of 2007. Data are from the Superintendencia de Sociedades, the governmental agency in charge of monitoring firms. Cash, Property Plant, and Equipment (PPE) and Sales are expressed in thousands of Colombian pesos (COP).

Table III: Cocaine Hydrochloride Confiscations

Department	1999	2000	2001	2002	2003	2004	2005	2006	2007
Amazonas	220	6	44	41	69	92	55	303	48
Antioquia	3,830	1,533	1,793	1,158	6,745	12,979	9,432	4,366	6,015
Arauca	33	1	3	19	84	42	117	4	31
Atlantico	2,356	2,537	522	3,326	82	3,296	8,766	6,675	405
Bogota	3,538	1,420	2,859	1,228	2,932	4,524	7,091	7,550	2,035
Bolivar	2,786	3,088	700	2,260	12,153	18,310	19,505	10,396	13,682
Boyaca	233	641	1,195	1,550	88	1,958	770	1,708	1,378
Caldas	28	0	0	867	2	1,560	569	2,843	241
Caqueta	211	10	1	3	0	455	1,279	115	62
Casanare	0	0	0	0	0	45	2	112	3,156
Cauca	1,663	898	1,114	31	3,707	1,791	5,127	1,823	6,919
Cesar	0	0	281	1,504	2	0	1,313	1,506	88
Choco	10	569	2	2,304	162	3,455	407	5,108	27,190
Cordoba	38	51	50	1,390	124	4,045	2,146	2,226	3,433
Cundinamarca	104	30	1,681	700	1,030	387	2,391	869	1,681
Guainia	1	0	398	0	0	0	0	0	3
Guajira	640	3,118	479	269	1,490	1,903	2,204	4,681	1,712
Guaviare	0	170	23	0	1	24	1,411	19	0
Huila	1909	75	185	256	9	79	133	8	45
Magdalena	1,521	3,096	4,661	4,015	4,128	2,800	13,238	4,482	1,686
Meta	204	713	689	9,021	918	625	789	1,045	1,275
Narino	3,121	971	2,926	17,237	14,184	31,756	44,576	20,617	15,514
Norte Santander	722	356	153	678	295	267	2,971	1,191	2,704
Putumayo	313	1,479	185	18	1	30	107	43	186
Quindio	23	91	5	951	9	4	8	15	18
Risarlada	56	252	24	10	600	863	69	82	85
San Andres y Providencia	42	3,310	6	4,191	3,796	7,067	7,809	7,012	973
Santander	1,680	542	1,353	33	50	1,209	2,349	1,093	6,030
Sucre	251	5,268	2,112	6,250	1,968	5,335	1,346	6	15
Tolima	42	101	0	18	963	45	67	26	63
Valle del Cauca	3,833	19,902	6,120	5,747	11,432	44,336	29,128	44,910	31,316
Vaupes	0	0	0	0	0	0	0	0	0
Vichada	0	0	1	0	0	0	3,274	64	3,428

This table presents the volume of cocaine hydrochloride (in kilograms) confiscated by the authorities across departments in Colombia from 1999 to 2007. Data are from the Colombian governmental agency responsible for the dissemination of information related to drugs and drug-related crimes.

Table IV: Deposit Growth and Municipality Exposure to Drug Activity

Panel A: Dependent Variable - Deposits Growth						
	Confiscations (1999-2007)			Confiscations (2003-2007)		
	(1)	(2)	(3)	(4)	(5)	(6)
Municipality Exposure*Post	-0.016	-0.016	-0.014	-0.019	-0.019	-0.016
	(0.005)	(0.005)	(0.003)	(0.006)	(0.006)	(0.004)
Post	0.032			0.032		
	(0.007)			(0.007)		
Observations	12,782	12,782	12,713	12,782	12,782	12,713
R^2	0.152	0.226	0.298	0.152	0.226	0.298
Municipality FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	No	Yes	No	No	Yes	No
Department-Time FE	No	No	Yes	No	No	Yes

Panel B: Dependent Variable - Deposits Growth						
	Confiscations per capita (1999-2007)			Confiscations/GDP (1999-2007)		
	(1)	(2)	(3)	(4)	(5)	(6)
Municipality Exposure*Post	-0.164	-0.164	-0.161	-0.001	-0.001	-0.000
	(0.063)	(0.062)	(0.073)	(0.000)	(0.000)	(0.000)
Post	0.033			0.032		
	(0.007)			(0.007)		
Observations	12,662	12,662	12,593	12,673	12,673	12,604
R^2	0.149	0.224	0.297	0.151	0.226	0.298
Municipality FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	No	Yes	No	No	Yes	No
Department-Time FE	No	No	Yes	No	No	Yes

This table presents OLS estimates of the effect of the anti-money laundering policy on deposits at the municipality level. The growth of the dependent variable is constructed as the annual difference in logs. In Panel A, the municipality exposure variable is accumulated cocaine confiscations between 1999 and 2007 (columns (1)-(3)) and between 2003 and 2007 (columns (4)-(6)). In Panel B, we normalize confiscations by population (columns (1)-(3)) and GDP (columns (4)-(6)). Post is a variable indicating the 2010-2011 period. The dependent variable is winsorized at the 1th and 99th percent level. Errors are clustered at the municipality level. *, **, and *** denote statistical significance at the 10, 5, and 1% levels, respectively.

Table V: Deposit Growth and Municipality Exposure to Drug Activity: Bank-Level and Robustness

Dependent Variable - Deposits Growth						
	Bank-Level		Foreign		$\geq$ 1 Bank (Bank Agrario)	
	(1)	(2)	(3)	(4)	(5)	(6)
Municipality Exposure*Post	-0.017	-0.011	-0.017	-0.011	-0.014	-0.013
	(0.003)	(0.003)	(0.004)	(0.003)	(0.003)	(0.003)
Municipality Exposure*Post*Foreign			-0.004	-0.004		
			(0.009)	(0.006)		
Post*Foreign			0.074			
			(0.093)			
Observations	26,011	26,003	26,011	26,003	18,274	18,266
R^2	0.505	0.799	0.505	0.799	0.538	0.842
Municipality FE	Yes	Yes	Yes	Yes	Yes	Yes
Department-Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Bank-Time FE	No	Yes	No	Yes	No	Yes

This table presents OLS estimates of the effect of the anti-money laundering policy on deposits at the bank-municipality level. The growth of the dependent variable is constructed as the annual difference in logs. The municipality exposure variable is accumulated cocaine confiscations between 1999 and 2007. Columns (3)-(4) include a dummy variable that indicates whether a bank is foreign owned. Columns (5)-(6) restrict the sample to municipalities where at least two banks operate. Post is a variable indicating the 2010-2011 period. The dependent variable is winsorized at the 1th and 99th percent level. Errors are clustered at the bank level. *, **, and *** denote statistical significance at the 10, 5, and 1% levels, respectively.

Table VI: The effect of the regulation on cross-country claims

Claims	By Jurisdiction	By Group
	(1)	(2)
High Risk		-3.797
		(0.0580)
High Risk x Post	-0.377	-0.322
	(0.188)	(0.0599)
Observations	480	32
R^2	0.883	0.999
Quarter FE	Yes	Yes
Jurisdiction FE	Yes	No

This table presents OLS estimates of the effect of policy on aggregate cross-country claims during 2008-2011. In Panel A, the dependent variable is the volume of claims owned by Colombian residents in foreign jurisdictions. $High\ Risk_c$ is an indicator on whether the jurisdiction contains high risk of being used to launder money, and $Post_q$ is an indicator set to one from 2010:Q1 onwards. In Panel B, claims are aggregated by regions with high or low risks. Dependent variables are in logs. Robust standard errors are reported in parentheses. *, **, and *** denote statistical significance at the 10, 5, and 1% levels, respectively.

Table VII: Banks' Internal Capital Markets

Loans to Deposits Ratio							
	Summary Statistics						
	(1) Municipalities	(2) Mean	(3) Min	(4) p25	(5) Median	(6) p75	(7) Max
Banco Agrario	710	1.50	0.00	0.71	1.17	1.94	8.88
Banco Caja Social BCSC	62	1.08	0.24	0.70	1.00	1.32	3.40
Red Multibanca Colpatria	28	0.73	0.00	0.08	0.33	1.15	3.27
AV Villas	49	0.80	0.22	0.52	0.76	0.93	2.83
Banco Corpbanca	22	1.26	0.21	0.50	0.76	1.89	5.28
Davivienda	147	0.70	0.00	0.33	0.60	1.00	2.16
Banco de Bogota	158	0.86	0.15	0.52	0.74	1.07	6.10
Banco de Occidente	40	0.96	0.02	0.51	0.80	1.28	2.44
Banco GNB Sudameris	12	1.71	0.00	0.59	1.17	2.59	4.68
Banco Popular	80	1.78	0.34	1.16	1.60	2.47	4.05
Bancolombia	167	1.25	0.07	0.67	1.06	1.54	6.99
BBVA Colombia	92	1.12	0.23	0.80	1.03	1.36	3.32
Citibank	10	1.08	0.20	0.43	1.21	1.73	1.86
Helm Bank	13	1.50	0.00	0.14	1.11	2.88	3.02
The Royal Bank of Scotland	4	0.75	0.00	0.01	0.53	1.49	1.93

This table presents summary statistics on the loan-deposit ratio across banks and municipalities at the end of 2007. Data are from the Superintendencia Financiera de Colombia, the Colombian government agency responsible for overseeing financial institutions.

Table VIII: Credit Growth and Bank Exposure to Affected Municipalities

Dependent Variable - Growth Commercial Credit			
	Growth Commercial Credit (2008-2011)		
	(1)	(2)	(3)
Bank Exposure*Post	-0.383	-0.430	-0.683
	(0.123)	(0.125)	(0.174)
Post	-0.189		
	(0.062)		
Observations	52,284	52,284	36,507
R^2	0.092	0.233	0.370
Municipality FE	Yes	Yes	No
Bank FE	Yes	Yes	Yes
Time FE	No	Yes	No
Municipality-Time FE	No	No	Yes

This table presents OLS estimates of the effect of bank exposure to the anti-money laundering regulation on growth of new commercial credit at the bank-municipality level. The growth of the dependent variable is constructed as the annual difference in logs. The bank exposure variable is measured as the share of deposits sourced from municipalities in the top quartile in terms of accumulated cocaine confiscations. The sample is restricted to municipalities not directly affected by the regulation (i.e., those with low or nil cocaine confiscations). Post is a variable indicating the 2010-2011 period. The dependent variable is winsorized at the 1th and 99th percent level. Errors are clustered at the municipality level. *, **, and *** denote statistical significance at the 10, 5, and 1% levels, respectively.

Table IX: The effect of firm exposure on firm-level outcomes

Panel A

Dependent Variable	(1) Sales	(2) Cash	(3) PPE	(4) Assets	(5) Financial Debt	(6) Net Profit	(7) Fin. Debt over Assets	(8) Fin. Debt over Liab
$Exposure_f$*Post	0.466	0.251	0.638	0.246	0.962	0.0984	-0.0461	-0.108
	(0.515)	(0.945)	(0.392)	(0.0848)	(1.440)	(0.108)	(0.0573)	(0.0965)
Small*Post	1.156	1.166	1.272	0.428	3.058	0.329	0.0424	0.109
	(0.533)	(1.186)	(0.537)	(0.145)	(1.488)	(0.130)	(0.0644)	(0.119)
Small*Post*$Exposure_f$	-1.432	-0.999	-1.524	-0.529	-3.742	-0.377	-0.0537	-0.141
	(0.618)	(1.342)	(0.629)	(0.165)	(1.704)	(0.150)	(0.0728)	(0.136)
Observations	15,373	14,722	15,368	15,374	15,374	15,299	15,374	15,371
R^2	0.816	0.682	0.842	0.980	0.715	0.378	0.751	0.722
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry-Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Municipality-Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry-Muni-Year FE	No	No	No	No	No	No	No	No

Panel B

Dependent Variable	(1) Sales	(2) Cash	(3) PPE	(4) Assets	(5) Financial Debt	(6) Net Profit	(7) Fin. Debt over Assets	(8) Fin. Debt over Liab
$Exposure_f$*Post	0.148	-0.156	0.676	0.207	1.324	0.0600	-0.0127	-0.0318
	(0.644)	(1.088)	(0.469)	(0.0998)	(1.699)	(0.118)	(0.0587)	(0.103)
Small*Post	1.504	1.163	1.826	0.351	3.089	0.346	0.0807	0.177
	(0.771)	(1.374)	(0.656)	(0.183)	(1.841)	(0.174)	(0.0756)	(0.142)
Small*Post*$Exposure_f$	-1.863	-1.033	-2.249	-0.441	-3.697	-0.387	-0.0886	-0.210
	(0.896)	(1.555)	(0.765)	(0.208)	(2.111)	(0.197)	(0.0859)	(0.161)
Observations	12,783	12,200	12,777	12,784	12,784	12,712	12,784	12,781
R^2	0.832	0.717	0.846	0.981	0.753	0.455	0.778	0.759
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry-Year FE	No	No	No	No	No	No	No	No
Municipality-Year FE	No	No	No	No	No	No	No	No
Industry-Muni-Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

This table presents OLS estimates of the effect of firms' indirect exposure to the anti-money laundering policy on firm-level outcomes. $Exposure_f$ is the measure of firm-level exposure as measured by the weighted average of the exposure of the banks a firm has a credit relationship with. The sample is restricted to firms in municipalities with low or nil illicit drugs activities, i.e. those below the 75th percentile in accumulated confiscations. Data are from 2006 to 2014, and Post is an indicator for the 2010-2014 period. The dependent variables are logged and winsorized at the 1th and 99th percent level. Errors are clustered at the firm level. *, **, and *** denote statistical significance at the 10, 5, and 1% levels, respectively.

Table X: Employment

Panel A

	(1) Small	(2) Large
	2010	
Indirect Exposure$_m$	-0.421	-1.918
	(0.216)	(1.586)
Observations	118	118
R^2	0.656	0.382
Department FE	Yes	Yes

Panel B

	(1) Small	(2) Large	(3) Small	(4) Large	(5) Small	(6) Large	(7) Small	(8) Large
	2011		2012		2013		2014	
Indirect Exposure$_m$	0.137	1.565	0.191	-0.923	-0.415	1.057	-0.126	-0.215
	(0.373)	(1.509)	(0.205)	(0.942)	(0.363)	(1.233)	(0.190)	(0.412)
Observations	118	118	118	118	118	118	118	118
R^2	0.665	0.594	0.361	0.395	0.405	0.498	0.609	0.186
Department FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

This table presents OLS estimations of the effect of the funding gap on employment. *Indirect exposure*$_m$ is a measure of the exposure of a municipality to the funding gap as measured by the weighted average of the exposure of the banks that provide credit in that municipality. Column 1 in Panel A reports the results on employment growth between 2009 and 2010 in firms with less than 51 employees. Column 2 reports the results for firms with 51 or more employees for the same period. Panel B reports the results of the placebo test, running the same test for the years 2011-2014. Errors are clustered at the department level and all specifications include department fixed effects. *, **, and *** denote 10, 5 and 1 percent level of significance respectively.

Table XI: Number of Firms

Panel A

	(1) All firms 2010
Indirect Exposure$_m$	-0.124
	(0.0718)
Observations	117
R^2	0.521
Department FE	Yes

Panel B

	(1) All firms 2011	(2) All firms 2012	(3) All firms 2013	(4) All firms 2014
Indirect Exposure$_m$	-0.0374	-0.111	0.0241	0.0232
	(0.101)	(0.0562)	(0.0619)	(0.0556)
Observations	117	117	117	117
R^2	0.479	0.442	0.330	0.478
Department FE	Yes	Yes	Yes	Yes

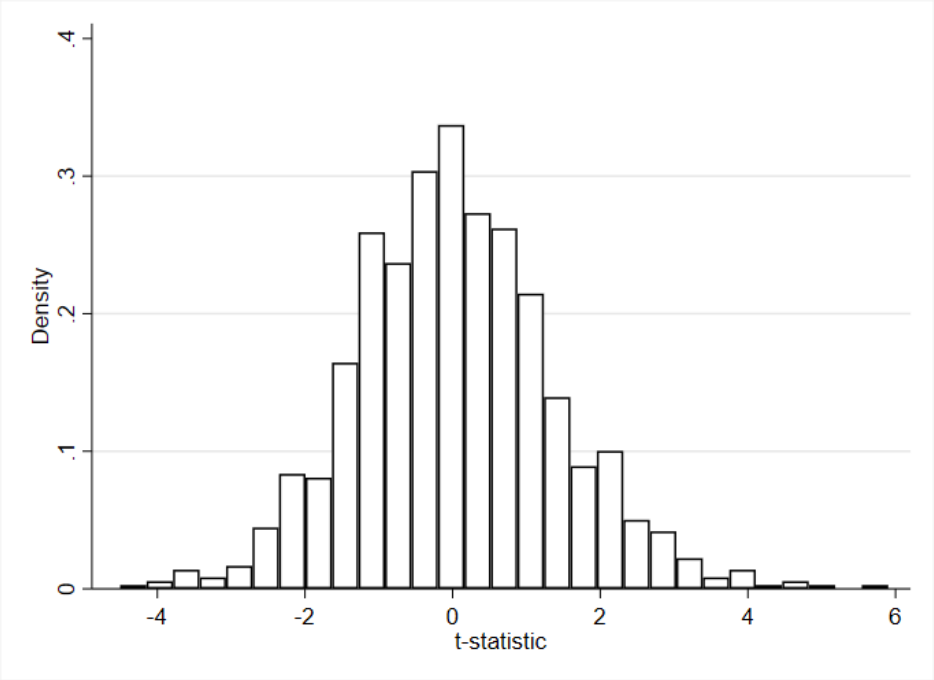
This table presents OLS estimations of the effect of the funding gap on number of firms within a municipality. *Indirect exposure*$_m$ is a measure of the exposure of a municipality to the funding gap as measured by the weighted average of the exposure of the banks that provide credit in that municipality. Panel A reports the results on growth in the number of firms between 2009 and 2010. Panel B reports the results of the placebo test, running the same test for the years 2011-2014. Errors are clustered at the department level and all specifications include department fixed effects. *, **, and *** denote 10, 5 and 1 percent level of significance respectively.

Table XII: Real Economic Activity

Nightligths	(1)	(2)	(3)
$Indirect\ Exposure_m$ * Post	-0.380	-0.380	-0.503
	(0.144)	(0.144)	(0.152)
Post	0.662		
	(0.104)		
Observations	4,536	4,536	4,536
R^2	0.897	0.900	0.910
Municipality FE	Yes	Yes	Yes
Time FE	No	Yes	No
State-Year FE	No	No	Yes

This table presents OLS estimations of the effect of the funding gap on real economic activity, as proxied by the intensity of night lights at the municipality level. The dependent variable is the log of the intensity of lights at the municipality-year level. $Indirect\ exposure_m$ is a measure of the exposure of a municipality to the funding gap, constructed as the weighted average of the exposure of the banks that provide credit in that municipality. Post is a variable indicating the 2010-2014 period. The dependent variable is winsorized at the 1th and 99th percent level. *, **, and *** denote statistical significance at the 10, 5, and 1% levels, respectively.

Figure A1: Placebo Test: Randomization of Municipalities' Exposure



This figure provides the t-stats obtained in our placebo test aimed at ruling out spurious correlation. For this, we randomize municipalities' exposure to cocaine activity one thousand times and repeat our baseline test, recording the t-stat obtained.

Table A1: Deposits (levels) and Municipality Exposure to Drug Activity

Panel A: Dependent Variable - Log Deposits						
	Confiscations (1999-2007)			Confiscations (2003-2007)		
	(1)	(2)	(3)	(4)	(5)	(6)
Municipality Exposure*Post	-0.009	-0.009	-0.008	-0.010	-0.010	-0.008
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Post	0.098			0.098		
	(0.006)			(0.006)		
Observations	12964	12964	12895	12964	12964	12895
R^2	0.971	0.974	0.975	0.971	0.974	0.975
Municipality FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	No	Yes	No	No	Yes	No
Department-Time FE	No	No	Yes	No	No	Yes

This table presents OLS estimates of the effect of the anti-money laundering policy on deposits at the municipality level. The dependent variable is the log of deposits. In Panel A, the municipality exposure variable is accumulated cocaine confiscations between 1999 and 2007 (columns (1)-(3)) and between 2003 and 2007 (columns (4)-(6)). In Panel B, we normalize confiscations by population (columns (1)-(3)) and GDP (columns (4)-(6)). Post is a variable indicating the 2010-2011 period. The dependent variable is winsorized at the 1th and 99th percent level. Errors are clustered at the municipality level. *, **, and *** denote statistical significance at the 10, 5, and 1% levels, respectively.

Table A2: Deposit Growth and Municipality Exposure to Drug Activity - Passage of the regulation

Panel A: Dependent Variable - Deposits Growth						
	Confiscations (1999-2007)			Confiscations (2003-2007)		
	(1)	(2)	(3)	(4)	(5)	(6)
Municipality Exposure*Post	-0.011	-0.011	-0.009	-0.011	-0.011	-0.009
	(0.004)	(0.004)	(0.003)	(0.004)	(0.004)	(0.003)
Post	0.090			0.090		
	(0.005)			(0.005)		
Observations	12782	12782	12713	12782	12782	12713
R^2	0.184	0.226	0.297	0.184	0.226	0.297
Municipality FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	No	Yes	No	No	Yes	No
Department-Time FE	No	No	Yes	No	No	Yes

This table presents OLS estimates of the effect of the anti-money laundering policy on deposits at the municipality level. The dependent variable is the log of deposits. In Panel A, the municipality exposure variable is accumulated cocaine confiscations between 1999 and 2007 (columns (1)-(3)) and between 2003 and 2007 (columns (4)-(6)). In Panel B, we normalize confiscations by population (columns (1)-(3)) and GDP (columns (4)-(6)). Post is a variable indicating the 2008q3-2011 period. The dependent variable is winsorized at the 1th and 99th percent level. Errors are clustered at the municipality level. *, **, and *** denote statistical significance at the 10, 5, and 1% levels, respectively.

Table A3: Deposit Growth and Municipality Exposure to Drug Activity: Confiscations by National Forces

Panel A: Dependent Variable - Deposits Growth			
	Confiscations (2002-2007)		
	(1)	(2)	(3)
Municipality Exposure FFMM *Post	-0.010	-0.010	-0.007
	(0.003)	(0.003)	(0.003)
Post	0.039		
	(0.007)		
Observations	12,782	12,782	12,713
R^2	0.153	0.227	0.298
Municipality FE	Yes	Yes	Yes
Time FE	No	Yes	No
Department-Time FE	No	No	Yes

This table presents OLS estimates of the effect of the anti-money laundering policy on deposits at the municipality level. The growth of the dependent variable is constructed as the annual difference in logs. The municipality exposure variable is accumulated cocaine confiscations made by the national military forces between 2002 and 2007. Post is a variable indicating the 2010-2011 period. The dependent variable is winsorized at the 1th and 99th percent level. Errors are clustered at the municipality level. *, **, and *** denote statistical significance at the 10, 5, and 1% levels, respectively.

Table A4: The effect of firm exposure on firm-level outcomes: Tradable vs non-tradable

	(1) Sales	(2) Cash	(3) PPE	(4) Assets	(5) Financial Debt	(6) Net Profit	(7) Fin. Debt over Assets	(8) Fin. Debt over Liab
Postx$Exposure_f$	1.305	-1.826	1.052	0.366	-0.605	-0.0132	-0.186	-0.304
	(0.588)	(1.342)	(1.268)	(0.164)	(1.958)	(0.188)	(0.0977)	(0.132)
SmallxPost	2.756	0.712	2.451	0.704	0.941	0.116	-0.0986	-0.0320
	(0.986)	(2.364)	(1.414)	(0.372)	(2.194)	(0.218)	(0.150)	(0.209)
SmallxPostx$Exposure_f$	-3.285	-0.308	-3.045	-0.844	-1.154	-0.111	0.115	0.0322
	(1.163)	(2.670)	(1.611)	(0.421)	(2.526)	(0.244)	(0.170)	(0.236)
SmallxPostxTradable	-1.840	0.634	-1.059	-0.557	3.285	0.385	0.262	0.295
	(1.423)	(2.824)	(1.591)	(0.411)	(3.345)	(0.334)	(0.168)	(0.275)
PostxExposurexTradable	-1.661	2.563	-0.592	-0.227	2.834	0.113	0.249	0.395
	(1.080)	(1.949)	(1.329)	(0.206)	(2.963)	(0.237)	(0.118)	(0.184)
SmallxPostx$Exposure_f$xTradable	2.117	-1.387	1.473	0.642	-4.093	-0.483	-0.301	-0.355
	(1.669)	(3.197)	(1.835)	(0.466)	(3.867)	(0.380)	(0.190)	(0.313)
Observations	12,783	12,200	12,777	12,784	12,784	12,712	12,784	12,781
R^2	0.832	0.717	0.846	0.981	0.753	0.455	0.779	0.759
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry-Municipality-Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

This table presents OLS estimates of the effect of firms' indirect exposure to the anti-money laundering policy on firm-level outcomes. $Exposure_f$ is the measure of firm-level exposure as measured by the weighted average of the exposure of the banks a firm has a credit relationship with. $Tradable$ is an indicator for firms in the tradable sector. The sample is restricted to firms in municipalities with low or nil illicit drugs activities, i.e. those below the 75th percentile in accumulated confiscations. Data are from 2006 to 2014, and Post is an indicator for the 2010-2014 period. The dependent variables are logged and winsorized at the 1th and 99th percent level. Errors are clustered at the firm level. *, **, and *** denote statistical significance at the 10, 5, and 1% levels, respectively.