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The repo market in Mexico: Empirics and stylized facts[☆]

María Usi López[a], Serafín Martínez-Jaramillo[b,*], Fabrizio López-Gallo Dey[b]

[a] Central Bank Operations general directorate at Banco de México, Av. 5 de Mayo No. 6, Col. Centro, Ciudad de México
[b] Financial Stability general directorate at Banco de México, Av. 5 de Mayo No. 1, Col. Centro, Ciudad de México

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ABSTRACT

This paper is a thorough description of the repo market in Mexico, a funding market of significant importance for Mexican commercial banks, brokerage houses, and development banks, and which, unlike the repo markets in Europe and the U.S., is an OTC market with no central counterparty or tri-partite repos. In this paper, we describe the counterparties which are involved in repo transactions, as well as distribution by collateral type, and provide some further metrics on the trading volume and other informative statistics on haircuts and rates. Given that Banco de México possesses information on individual repo transactions from 1998, we also study the evolution of this market, paying particular attention to the financial crisis that started in 2007. This is one of a few descriptive papers on this market due to the extremely detailed and granular data base on repo transactions in Mexico. The main contribution of this paper is to document and describe the structure of a market for which there exists a long history of individual repo transactions and which is of great importance from the perspective of the funding structure of banks.

1. Introduction

The financial crisis that started in 2007 and changed many of the paradigms in economics and finance opened new areas of research in which academics and regulators have been intensively working for the last few years. There is some consensus that the recent crisis at its most difficult periods had an important liquidity funding component. After a long period in which liquidity was abundant, suddenly, global financial markets experienced a liquidity drought, which eventually obliged central banks to intervene on a scale never seen before.

One funding market, among the most important ones in the U.S., is the repo market. According to [1] and [2], the repo market experienced a run-like phenomenon during the recent financial crisis; however, in [3] the authors revise with new evidence the existence of such a run in the repo market. This phenomenon was new, and neither market participants nor regulators were aware of such a weak point in the financial system. International bodies like the Financial Stability Board (FSB) have been scrutinizing the role of the repo market in modern financial systems and have provided some recommendations in order to strengthen this market in the context of financial stability [4]. It is important to point out that the FSB also attempts to bring inside the regulatory perimeter the so-called shadow banks, for which the repo market represents an important segment of financial activity [5].

After the creation of deposit insurance institutions, we thought that run-like dynamics were very difficult to observe in modern times, but history proved us wrong again. It is true that we do not see runs like those in the past, with people queuing at bank branches to withdraw their deposits, with the exception of Northern Rock in the U.K. However, nowadays banks are subject to more dangerous type of bank runs: wholesale funding runs. Unlike retail deposits, which are widely considered as a more stable funding source, wholesale funding can evaporate rapidly, leaving the bank with enormous funding pressures which are also difficult to substitute on a short-term basis.

A repo transaction, also known as a repurchase agreement, involves a lender, a borrower, cash, collateral, and a rate. In a typical bilateral repo transaction, the lender *A*, lends cash to the borrower *B*; and the borrower *B* transfers ownership of the collateral and the premium (rate) to the lender *A*. The agreement also includes the term of the repo, and it is at the end of this

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* Corresponding author.
E-mail address: smartin@banxico.org.mx (S. Martínez-Jaramillo).

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Table 1
Minimum collateral rating required.

	Scope	Standard and Poor's	Moody's	Fitch	(HR ratings)
Short term	Domestic	mxA-3	MX-3	F3(mex)	HR 3
	Global	A-3	3	F3	HR 3 (G)
Long term	Domestic	mxAA-	Aa3.mx	AA-(mex)	HR AA-
	Global	AA-	Aa3	AA-	HR AA- (G)

term that the borrower should repurchase the collateral again at the agreed price, plus the premium.

In industry parlance, the cash borrower (security seller) is said to perform a repo transaction, whereas the cash lender (security buyer) performs a reverse repo. Such terms are widely used by the industry, but these terms also hide the important nature of what a repo really is: a collateralized loan. In this paper, we will rather use the terms lender and borrower because the repo in Mexico is mostly used as a short-term funding transaction.

In addition to repurchase agreements, securities lending also takes place in Mexico, and the data is also available at the central bank. However, the preferred object of study for this paper is the repo market alone, as the size of the market implications for financial stability are considerably different from one market to the other.

One important aspect of the lack of empirical works in such an important market are the data gaps. There exists a scarcity of empirical literature on repo markets. This is not an overview paper, and we can only point to two different empirical works, one for Europe [6] and one for the U.S. [7].

In this paper, in addition to describing the different dimensions and evolution of the repo market, we compute the haircuts for very long time series and for each individual transaction. Despite the existence of industry guidelines and academic works on haircuts [8–10], we show that there are empirical facts difficult to explain from any of these perspectives. One of the main proposals by the FSB is to establish floors on the haircuts in order to curb their pro-cyclicality. We show that in Mexico the haircuts remained stable even during the worst moments of the crisis, and the same happened with the rates and volume. We also show that the rate dispersion in the repo market, measured in a simple way by its standard deviation, decreased considerably, possibly indicating an improvement in the efficiency of the market.

The rest of the paper is organized as follows: in Section 2, the institutional framework for the repo market in Mexico is provided, whereas Section 3 explains briefly the data set used in this paper. Section 4 is the main body of the paper, in which the market is extensively described through many different graphs and statistics. Section 5 provides empirical results on haircuts and rates, whereas Section 6 describes the structural properties of the repo market by resorting to network theory. Finally, Section 7 concludes and also describes important forms of using the information provided by such a relevant market.

2. The regulatory framework in Mexico

The repo market in Mexico plays a significant role in the funding structure of banks and brokerage houses. This market has grown in recent years despite the crisis, unlike its European and U.S. counterparts. However, the crisis showed the danger of short-term funding strategies, even if such funding is collateralized. In Mexico, the repo market is regulated by the central bank, and according to this regulation, only banks and brokerage houses are able to perform repo transactions. The set of institutions and individuals who can perform reverse repo transactions is considerably larger and includes investment funds (sociedades de inversión), pension funds (Siefores), firms, treasuries, individuals, state, quasi-state and municipal governments, authorities such as Banco de México and the IPAB, foreign financial institutions, and other financial institutions in Mexico like insurance companies.

When a bank or brokerage house performs a repo transaction with entities of the same financial group, qualified investors, or individuals, the securities used as collateral for the repo must have the minimum rating from at least two rating agencies according to Table 1.

Credit institutions and brokerage houses are able to perform reverse repos with Banco de México, other credit institutions, brokerage houses, and foreign financial institutions. It is possible to perform repo transactions with foreign securities subject to some restrictions.

There are no constraints on the maturity of the repos, with the exception that the security must have a maturity greater than the maturity of the repo, including extensions to the term of the repo. The exchange of cash and securities cannot be greater than four days after the date in which the transaction takes place. The exchange of cash and securities must be made on the maturity date. It is possible to liquidate a repo before maturity under the conditions of the contract.

Repo transactions between entities and institutional investors must be under the framework contract approved by the Mexican Bankers Association and the Stock Exchange Intermediaries Association. This contract must be elaborated under the recommendations approved by the International Securities Market Association (ISMA) or the Bond Market Association.

Finally, a very important restriction is that banks cannot perform repo or reverse repo transactions with securities issued or guaranteed by themselves. These are the most relevant aspects of the institutional framework for the repo market in Mexico.

2.1. Banco de México: the repo as a means to inject liquidity into the financial system

As part of its operational objective of monetary policy, Banco de México injects liquidity into the financial system through one of the following transactions or their combination: (i) through simple loan agreements backed by the so-called Depósitos de Regulación Monetaria (DRM)[1] or by U.S. dollar deposits at the central bank; or (ii) through repo transactions on eligible securities, subject to certain rules. Repo transactions with Banco de México have a maturity of one bank business day; once agreed, the central bank will deposit the credit up to the amount of the securities' market value, adjusted by a discount factor or haircut.

The repo transactions carried out with Banco de México as counterparty or cash lender will have a premium equal to the repo rate, times the volume (market value of the securities, times the number of securities transacted), times the number of natural days after the transaction date and until the next immediate bank business day, divided by 360. The repo rate will be equal to the interbank reference rate outstanding at the clearance date, multiplied by: i) a factor of 2 for the federal government type of securities described above (i.e. twice the reference rate);

[1] DRMs are mandatory long-term reservoirs that local credit institutions maintain at the central bank.