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Regulatory Arbitrage and Window-Dressing in the Shadow Banking Activities: Evidence from China's Wealth Management Products

By* CAI JINGHAN, ALICIA GARCIA-HERRERO and XIA LE

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Abstract

We examine wealth management products (WMP) issued by Chinese commercial banks, which are an important part of China's fast growing shadow banking sector. We document that the WMPs' maturity dates cluster toward the end of a month and then decrease significantly at the beginning of the following month. Our empirical work detects a negative relationship between a bank's loan-to-deposit ratio (LDR) at the end of a quarter and the number of its issued WMPs expiring within several days of the quarter-end. Our findings suggest that banks are using WMPs as vehicles for their regulatory arbitrage or window-dressing behaviors.

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1. Introduction

The outburst of the sweeping Global Financial Crisis (GFC) in 2008-2009 put the shadow banking systems in advanced economies under the spotlight. Many scholars and policymakers concluded that the unregulated activities of shadow banks had greatly increased the vulnerabilities of the global financial system and led to the contagion of financial crisis across borders. (Bernanke, 2012; Gorton and Metrick, 2012)

In the aftermath of the GFC, the regulators around the world set out to overhaul their regulatory frameworks and, as one of important objectives, have been attempting to include the shadow banking system under the new regulatory umbrella. In the meantime, both academia and policymakers started to enhance their research on the shadow banking activities.

The relevant literature has prospered after the GFC, especially about the shadow banks in advanced economies such as US. Claessens et al. (2012) has made a concise survey of the existing academic studies about the US shadow banks. Claessens et al. (2012) point out that regulatory arbitrage is one of key motives for banks to engage in shadow banking activities (particularly securitization). Acharya et al. (2013, a) provide empirical evidence of how US banks utilized commercial paper conduits to reduce regulatory capital charge.

Financial Stability Board (FSB, 2012) finds that the shadow banking systems are prevalent globally, even in many emerging economies. International Monetary Fund (IMF, 2014)avers that the growth of shadow banking system in emerging markets even outpaced their traditional banking system. In particular, China has a large-sized and fast-growing shadow banking sector. As estimated by FSB (2014), the aggregate size of China's shadow banking sector has approached to around USD 3 trillion as of end-2013, increasing by more than 37% from the previous year.

It is noted that the shadow banks in emerging markets could have different characteristics from their peers in advanced economies. Acharya et al. (2013, b) find that an important part of India's shadow banking system, non-bank financial corporations (NBFCs), perform as a substitute for banks' direct lending in the country's rural areas, which is in contrast to the role of shadow banks in advanced economies. Dang et al. (2014) make a comprehensive comparison between the shadow banking system in China and that in US, concluding that China's shadow banking is much more reliant on banks to perform many basic functions of credit intermediation while the US shadow banking system is more market-oriented and being operated in parallel to banks.

In this study, we analyze one important part of China's shadow banking system—wealth management products (WMPs) issued by banks. The bank issued WMPs in China are financial contracts which are sold to investors through banks' channels. The WMPs can offer higher interest rates than traditional deposits since the latter are capped by the authorities.[1]Generally, the WMPs have fixed maturities and can't be circulated before their expirations. To a certain extent, a WMP is like a fixed-term deposits contract offered by banks which strictly cannot be withdrawn before its maturity. However, WMPs are not being treated as deposits by the regulator in calculating some important regulatory indicators such as the LDR and Required Reserve Ratio (RRR) for deposits.

Our investigation shows that the WMPs' maturity dates cluster toward the end of a month and then decrease significantly at the beginning of the following month. Such a pattern could be

[1]After several rounds of liberalization, China's deposit rates are currently capped at 30% above the benchmark deposit rates. Indeed, the cap on the interest rates constitutes one important form of financial repression in China (Wei and Tapsoba, 2014)

caused by banks' regulatory arbitrage and window-dressing, in particular for a lowerLDR at the end of a month (or quarter). With more WMPs maturing within several days of a month end, banks can manage to keep the proceeds of these WMPs in forms of deposits for a short period. As such, banks can boost their deposits at the end of the monthso as to meet the regulator's LDR requirement and window-dress their balance sheets.

We further examine the direct impact of WMPs' expiration on a bank's LDR. Toward this end, we build a novel dataset of Chinese small-and-medium sized banks by matching their financial information with the numbers of WMPs issued by them in the period of 2007-2013. Then we regress the numbers of WMPs which expired just ahead of the end of a quarter, on their bank issuers' LDRs at the quarter-end. Our regression models detect a negative relationship between a bank's LDR and the number of its WMPs expiring ahead of the quarter-end. In summary, our results suggest that banks are using WMPs as vehicles for their regulatory arbitrage or window-dressing behaviors.

The remainder of this paper is organized as follows. Section 1 provides some background information about the WMPs issued by banks and the LDR regulation in China. Section 2 discusses the mechanism how banks' WMPs could affect their LDRs. Section 3 describes the data and presents our empirical results. Section 4 concludes.

2. Background information

2.1 The WMPs issued by banks

In China WMPs can be issued by both banks and other non-banking financial institutions, such as trust companies, securities firms and insurance companies. In this paper, we only focus on the ones issued by banks.

Bank issued WMPs are distributed by banks to individual and institutional investors. A WMP could have a minimum subscription share. In August 2011, the China Banking Regulatory Commission (CBRC), China's banking regulator, circulated a directive[2](namely, "a directive of regulating bank's marketing and sales of wealth management products", the Directive afterward) which unified the minimum subscription share of a WMP for an individual investor at RMB 50,000 (equivalent to around USD 8,000), effective from January 2012. However, before the implementation of this directive, banks have the discretion to set the minimum subscription share for their issued WMPs. In some cases, the minimum subscription share could be as lower as RMB 1,000(equivalent to around USD 150).

Theoretically, a WMP is set up to purchase and hold financial assets which are expected to bring investment returns for its investors. The financial assets acquired by WMPs are diverse, ranging from loans, money market funds, commercial papers, bonds, stocks, and even private equity.[3]

In generally, a WMP has a fixed-term maturity. When a WMP expires, its originating bank needs to pay off both principals and interest rates. Before a WMP's maturity day, its holders have no right to ask banks to repay them in full or part of principals or interest rates. Moreover, there is no secondary market for the WMPs. In this sense, a WMP is like a closed-end fund without a secondary market.

The maturities of bank issued WMPs could range from 1 day to 5 years. Banks can establish

[2] It Chinese version is available at http://www.cbrc.gov.cn/chinese/home/docDOC_ReadView/20111009E63FE2BF1B07CFCAFFB978A4C2F0DC00.html

[3] The dataset of WIND provides very broad classifications for WMPs in terms of their holding assets. Indeed, a WMP can hold different classes of financial assets. The information disclosure of the underlying assets is always inadequate. Evenmany buyers are not clear about the underlying assets of the WMPs they purchased.

their cash pools through issuing and rolling over WMPs while use the proceeds to extend normal loans or hold long-term financial assets, which could create serious risks of maturity mismatch. In concern of the increasingly maturity mismatch risks, the authorities reportedly halt the issuance of the WMPs with a maturity of less than 1 month in November 2011.[4]

One important reason of the WMPs being able to attract investors is that their interest rates are not subject to the authorities' interest rate cap. As such, the WMPs can offer an alternative way for households to park their savings other than bank deposits. In marketing a WMP to investors, banks generally provide its expected return for reference. As stipulated by the CBRC, the expected return is not a guaranteed one unless the bank manifest that it provides credit guarantees for the WMP's principal or even interest rates. But in that case, the WMP is required to be included in a bank's own balance sheet. On the other hand, a WMP without its originating bank's credit guarantee can be treated as the bank's off-balance-sheet business and doesn't need to be booked in its balance sheet.

Interestingly, the default cases of WMPs were very rare before 2014 no matter whether credit guarantees were provided by their originating banks (Zhu and Conrad, 2014). Dang et al. (2014) point out that the no-default phenomenon could strengthen individual investors' misperception that all the WMPs enjoy their originating banks' unconditionally backstop. It is possible that banks try to provide certain support to their issued WMPs in order to maintain their reputations in the WMP businesses.

Acharya et al. (2014) find that large banks tend to issue more WMPs, which in turn pose higher financial stability risks to them. They also find that the number of issued WMPs has a negative relationship with large banks' leverage (which is defined as the ratio of a bank's asset size to equity).Their draw the conclusion that large banks have larger capital buffers to withstand the related risks.

2.2 The importance of the loan-to-deposit ratio

The importance of the LDR, which is defined as a bank's unweighted loans to deposits, can hardly be overestimated. It constitutes a key building block of Chinese banking regulation framework and banks' own risk management systems, in particular for liquidity risk.

Both China's 1995 Commercial Banking Law and the 2003 Commercial Banking Law stipulate that "the ratio of the average balance of loans and the average balance of deposits shall not exceed 75 percent". Traditionally, the commercial bank's compliance with the regulatory LDR was evaluated on a quarterly basis, and the basis for computation was typically the balance of loans versus the balance of deposits at the end of each month. This traditional calculation of LDR based on the quarter-end balances of loans and deposits has created strong incentives for commercial banks to maneuver it to their favor, either by boosting deposits or contracting loans at the end of a month. The LDR is one of 13 core indictors of China's CARPALs rating system[5], a lower score of which could threaten to drag down the bank's overall regulatory rating and trigger the regulator's intervention.

Whereas the 75% cap of the LDR was written into the Commercial Banking Law since 1995, it was not until 2004 that the sector-wide LDR fell below this statutory requirement for the first time. The sector-wide LDR had been trending down for several years and hit its bottom of 66.9% in 2008. Since then, banks' LDR have rebounded due to China's credit binge aiming to coordinate a massive stimulus package to counter the global financial crisis (GFC). Starting from

[4] It was reported by China Daily, an official English newspaper in China. The report is available at http://www.chinadaily.com.cn/china/2011-11/18/content_14115785.htm

[5]CAPRALs is the Chinese equivalent to the CAMELS rating system in the US and the ARROW regulatory framework in the UK.

mid-2011, banks have been reportedly required by the CBRC to report their LDRs on a daily basis (Ma et al., 2011).

In the meantime, the LDR is also an important part of banks' internal risk management and performance assessment systems. Liu (2014) reports that almost all the banks use the LDR as an indicator in assessing their branches' performance. Moreover, the LDR is one of financial indicators which banks need to disclose to the investors of their equities or bonds. Generally, these financial indicators provided by banks are the quarter-end ones. The external investors rely on these indicators to assess the creditworthiness of the banks and then make their investment decisions. As such, the LDR, along with other financial indicators, becomes a signal which banks send to the public, which gives banks more incentive to do the window-dressing, in particular at the end of the quarter.

The banks' window-dressing motivation is so strong that the balances of banks' deposits still vary a lot within a month even after their LDR reporting was changed to be on a daily basis. In view of it, the CBRC had to unveil new rules in September 2014, requiring banks to keep the inter-day deviation of deposits below a certain level.[6]

2.3 Testable hypothesis

There is a widespread suspicion that Chinese banks use WMPs to manage down their LDRs at the end of a month or quarter, so as to comply with the regulatory requirement as well as to window dress their balance sheets. For example, the IMF (2012) conjecture that the maturity of the WMPs might be structured carefully to coincide with the timing at which they need to comply with the loan-to-deposit ratio (LDRs) although they don't provide relevant empirical evidence.

The way to manage WMPs for the LDR circumvention is straightforward. When a WMP expire, banks can wind down the financial assets[7] and keep the proceeds for a short period before the investors ask for redemption. During the short holding period, the proceeds will be converted to time deposits on the issuing bank's balance sheet. As such, the bank can temporarily and effectively boost its balance of deposits to meet the regulatory LDR requirement as well as send a signal to the public that its liquidity situation is in good shape.

In doing so, banks don't necessarily make the maturity date of a WMP fall exactly on the end of a month as long as they can persuade their investors not to withdraw their money(which comes from the redemption of the WMPs) over the weekend. One common practice is that banks issue new WMPs at the beginning of the following month for investors' subscription. As such, many investors will tend to leave their money in banks for a short period in the form of time deposits. But the intermission should be brief enough to hook up the investors.

It is noted that such a manoeuvre works for both the guaranteed and the non-guaranteed WMPs. For a non-guaranteed WMP, it expiration will simultaneously augment the bank assets because it was off-balance-sheet. In regarding for a WMP with the banks' credit guarantee, its expiration can only lead to the changes of different accounting items on the bank's balance sheet. In particular, time deposits of the bank will increase at the expense of an equivalent-amount decline in other liabilities, which theoretically should not affect the aggregate size of the bank's balance sheet.

Based on the above descriptions, we can set up a couple of testable hypotheses for our study.

[6] Refer to the relevant report by Financial Times, available at http://www.ft.com/cms/s/0/bef1c4ce-4919-11e4-9d04-00144feab7de.html#axzz3QgUDNZK2.

[7] Given the serious maturity mismatch between the WMPs and their holding assets, banks can arrange some short-term transactions (for example, a repurchase agreement) and then issue new WMPs to ensure that they can continue hold the assets. In any case, banks will get the proceeds from the expired WMPs.

Hypothesis I:if for any reason the banks deliberately manoeuvre the WMPs to boost their deposit balances at the end of a month or quarter, they should make the WMPs mature at or close to the end of the month or quarter. It means that we should observe a clustering of the WMPs' maturities at the month- and quarter-end.

Hypothesis II: banks' regulatory arbitrage and window-dressing behaviors should have significant impact on their LDRs. It suggest that there should exist a negatively relationship between a bank's LDR and its originated WMPs expiring at the end of the same month or quarter. We are going to test these two hypotheses in the rest of the paper.

3. Empirical Analysis

3.1 Data description and summary statistics

Our information of the bank issued WMPs is from the WIND dataset, from January 2007 to December 2013. For every WMP record, the WMP dataset in the WIND report its originating bank, its value date and maturity date. The dataset also reports whether WMP is guaranteed by the issue bank or not. One important shortcoming of the WMP dataset in the WIND is the lack of information about the amount of the WMPs. As a consequence, we can only use the number of WMPs issued by a bank as the proxy for the bank's exposure to the WMPs business. It looks like a reasonable proxy to reflect the activeness of a bank in this business.

The financial information of banks is from two sources. The WIND has a separate dataset which reports banks' disclosed financial information based on listed banks' regular financial reports and unlisted banks' prospectus for bond issuance in the interbank bond market. One advantage of the WIND bank-specific data is that they are reported on a quarterly basis, which enables us to maximally expand our sample. For banks whose financial information does not appear in the dataset of the WIND, we use the BANKSCOPE as supplement. The bank financial information in the BANKSCOPE is annually-based. Just like WMPs data, the selected period for bank information is from January 2007 to December 2013.

Figure 1 plots all the WMPs issued by banks from January 2007 to December 2013. During this reporting period, the number of bank issued WMPs had grown from 2,893 in 2007 to 54,761 in 2013, implying an average annual growth rate of 63.3%.

(Insert Figure 1 here)

Figure 2 shows the maturities of the bank WMPs during the reported period. Except for 2007 and 2008, the WMPs with a maturity of longer than one year only accounts for a small fraction of all the WMPs. In most of years, the majority of WMPs have maturities below six months. Another significant change in the pattern is that the percentage of WMPs with a maturity of less than one month sharply shrunk to 3-4% after it peaked at around 29.3% in 2011. As we explained in the previous section, the authorities reportedly halt the issuance of the WMPs with a maturity of less than one month in November 2011.

(Insert Figure 2 here)

Figure 3 provides more information about banks' credit guarantees attached to their issued WMPs. The percentage of guaranteed WMPs steadily declined from 64.9% in 2007 to 28.2% in 2012 and then sharply plunged to 6.5% in 2013. The collapse of guaranteed WMPs is due to a series of the authorities' clampdown on the irregularity in the WMPs business in 2012 and early 2013. In particular, the Directive effective from January 2012 and a new set of rules announced in March 2013 (namely, "a notice of regulating WMPs business"[8]) have greatly restricted banks' guarantees for their issued WMPs.

[8]Its Chinese version is available at http://www.cbrc.gov.cn/govView_2B22741AFBC446CF890636DACAB71166.html.

(Insert Figure 3 here)

3.2 The pattern of WMPs' maturity dates

This section analyzes the pattern of the WMPs' maturity dates. We present graphical evidence that the maturity dates of the WMPs cluster on a few days at the end of a month. We further show whether such a pattern holds in different sub-samples. Such a pattern is consistent with our hypothesis I which is set up in the previous section.

We group the WMPs based on the distance between their maturity dates and the month-ends. The below rules are followed in grouping:

- A WMP is to be classified into the group 0 if its maturity date exactly falls on the end of a month.
- If a WMP's maturity date is in two days after the end of a month, the WMP is to be classified into group 2.
- If a WMP's maturity date is on two days prior to the end of a month, it is to be classified into group -2.
- We ensure that every WMP only be classified into one group. For example, a WMP maturing on January 15th will be classified to the group 15 while a WMP maturing on January 16th will be in the group -15.

As such, there are in total 31 groups being formed, ranging from group -15 to 15 (afterwards we use groups of [i, j] to stand for all the groups from i to j where i and j are integrals between -15 and 15). Figure 4 plots the number of the WMPs in different groups. As shown, the number of the WMPs maturing on a month-end (the group 0) is pronouncedly higher than the ones maturing on other days. In terms of percentage, the WMPs in group 0 account for 12.0% of all the WMPs reported in our sample. Even within several days towarda month-end, the number of the maturing WMPs tends to be higher. For example, the WMPs in the groups of [-4,0] jointly account for 30.6% of the total WMPs. On the other hand, the percentage of the WMPs in the groupsof [1,5] is significantly lower. In our sample, only 10.1% of the WMPs maturing on the first five days of every month (the groups of [1,5]).

(Insert Figure 4 here)

Such a pattern of WMPs' maturity dates could be due to banks' regulatory arbitrage and window-dressing of their LDRs at the end of a month. By transferring the proceeds of unwinding the WMPs' assets into time deposit accounts, banks can effectively boost their LDRs over the month-end. Therefore, banks prefer to arrange the maturity dates of the WMPs at or very close to the end of a month so that they can manage to do regulatory arbitrage and window-dressing before the WMP investors ask for redemption. In the meantime, banks don't want to retain the proceeds of the WMPs for too long because it means they need to pay extra interest rates to the WMP investors.

We further investigate the WMP maturity dates in different sub samples. First, we find that such a pattern holds in both guaranteed and non-guaranteed WMPs (Figure 5). It is a reasonable because, as we described, both guaranteed and non-guaranteed WMPs permit banks to do the regulatory arbitrage and window-dressing of temporarily boosting deposits.

(Insert Figure 5 here)

Second, we investigate the WMP maturity dates at the end of a quarter and at a month-end which is not a quarter-end, which are plotted in panel A and B of Figure 7 respectively. The patterns shown in both Panel A and B are similar while the clustering of the WMP maturity dates appears to be more pronounced in Panel A. In particular, 11.4% of the WMPs maturing at a quarter-end compared to 10.% at a month-end which is not a quarter-end. Moreover, 32.6% of

the WMPs expire within 5 days prior to a quarter-end (the groups of [-4, 0]) compared to 23.1% otherwise.

It is no surprise that the quarter-end clustering of the WMP maturity dates is stronger because many banks disclose their key financial information at a quarterly basis. As a result, banks have a stronger motive to do the window-dressing of their LDRs at the end of a quarter on top of regulatory arbitrage.

3.3 Regression analysis

In this section, we directly examine whether banks can effectively lower their LDRs by temporally converting WMPs into deposits at the month-ends. As described in the previous section, we form a novel dataset by matching the number of WMPs with their issuer banks' financial fundamentals. As a result, the dataset is an unbalanced panel. The time series of the panel is on a quarterly basis due to the data availability. (The Wind only reports bank's quarterly information while the Bankscope only reported annually) It is that the clustering of the WMPs expiration is more pronounced at the quarter-ends, making it easier for us to detect its impact on the banks' LDRs.

The panel consists of 71 banks and 512 observations between March 2007 and December 2013. We in particular exclude the largest five commercial banks ("the Large Five") from the panel for two reasons. First, the WMPs issued by the "Large Five" accounts for almost one-third of total WMPs. In this sense, the Large Five are outliers in our sample. Second, the "Large Five" have been the major liquidity providers in China's interbank market. Sometimes even the central bank injects liquidity into the market via the Large Five. Therefore, they are much less constrained by liquidity compared to other banks.

Our strategy is simple. We directly regress a bank's reported LDRs on the numbers of its WMPs expiring within several days at the end of the quarter. If the clustering of the WMP expiration ahead of a quarter-end is due to banks' regulatory arbitrage or window-dressing behaviors, the regression models should yield a significantly negative coefficient on the number of WMPs expired within several days (5 days of [-4,0] in our baseline specification) of the quarter-end. As a control, we further investigate the impact of the WMPs expiring on the rest of days in the same month other than the days of [-4, 0]. Given the fact that banks will can retaining funds for too long, the WMPs expiring on the daysother than [-4, 0] should have a very weak impact on the banks' LDR at a quarter-end.

Our baseline specification is

$LDR_{it} = \alpha_i + \delta_t + \beta\, WMP_{it} + \varphi\, X_{it} + \varepsilon_{it}$

where $LDR_{it}$is the LDR of a bank i at at the end of the quarter t, WMP_{it} is the log number of the bank I 's WMPs expiring within five days of the end of the quarter t ([-4,0]), X_{it} are control variables, α_i are bank-fixed effects, and $\delta_t$are time-fixed effects. The control variables including the log size of a bank's total assets, the bank I's leverage ratio which is defined as a bank's total assets to its equity as well as non-performance loan ratio (NPL) at the end of a quarter. Table 1 shows the summary statistics (Panel A) and correlations between variables (Panel B) that we use in our regression analysis.

(Insert Table 1 here)

Panel A of Table 2 presents the results for the WMPs expiring on days of [-4,0]. The column (1) and (2) reports the results of OLS pool regressions. The column (3) and (4) reports the results of two random effect models with and without the controls of bank characteristics (leverage and NPL). The column (5) and(6) report the results of two fixed effect models while the column (7) and(8) are for fixed effect models with first differences.

(Insert Table 2 here)

In all eight regression results of Panel A, the (log) number of WMPs expiring on days of [-4,0] has a significantly negative coefficienton the LDR of the bank. It is consistent with our hypothesis that the WMPs are used by some banks as the vehicles for their regulatory arbitrage and window-dressing behaviors.

Panel B of Table 2 presents the results for the WMPs expiring on the daysother than [-4, 0] of the month. In all eight regression models, these WMPs don't appear to have any significant impact on their issuing banks' LDRs.

Table 3 exhibits some robustness checks. In Panel A of Table 3, we investigate the subsample of the period after the GFC (2009 onwards). In Panel B we focus on the WMPs which have a maturity less than a year. In both cases, the results are highly consistent with those in Table 2, meaning that the expiration of WMPs may be due to the consideration of LDR requirement.

Furthermore, it may be argued that the window choice of [-4,0] is purely arbitrary with no justification. For robustness, we further vary the lengths of windows and redo the exercise. The results are shown in Panels C and D of Table 3. In Panel C and D we examine the WMPs expiring on the days of [-3,0] and [-7,0] respectively. In all these new samples, a negatively significant relationship between a bank's LDR at a quarter-end and the number of its WMPs at and close to the quarter-end.

(Insert Table 3 here)

4. Conclusion

We examine wealth management products (WMP) issued by Chinese commercial banks, which are an important part of China's fast growing shadow banking sector. We document that the WMPs' maturity dates cluster toward the end of a month and then decrease significantly at the beginning of the following month, implying that banks may maneuver the expiration dates of WMPs to meet the LDR requirements, among others. A direct test further detects a negative relationship between a bank's loan-to-deposit ratio (LDR) at the end of a quarter and the number of its issued WMPs expiring within several days of the quarter-end. Our findings suggest that banks are using WMPs as vehicles for their regulatory arbitrage or window-dressing behaviors.

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Figure 1: The number of WMPs issued by banks

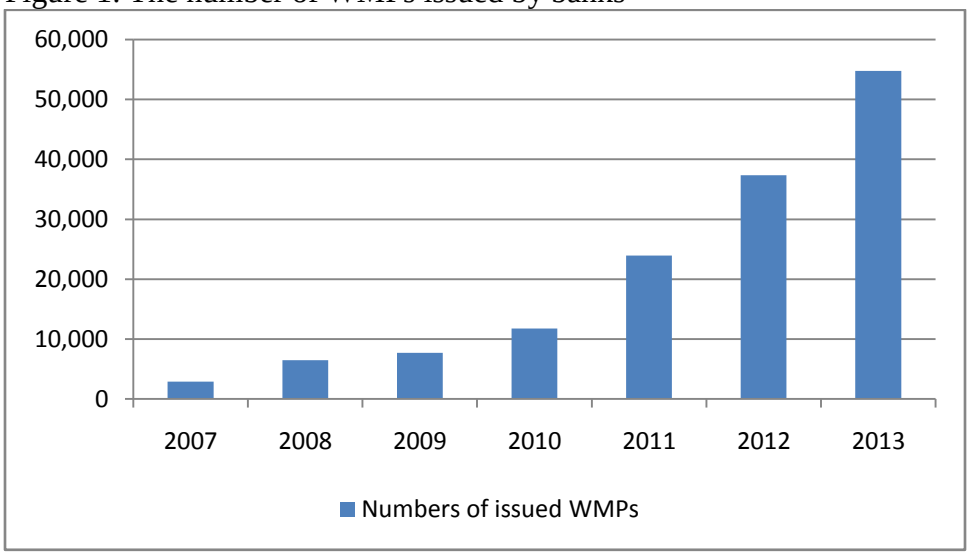


Figure 2: The maturities of the WMPs

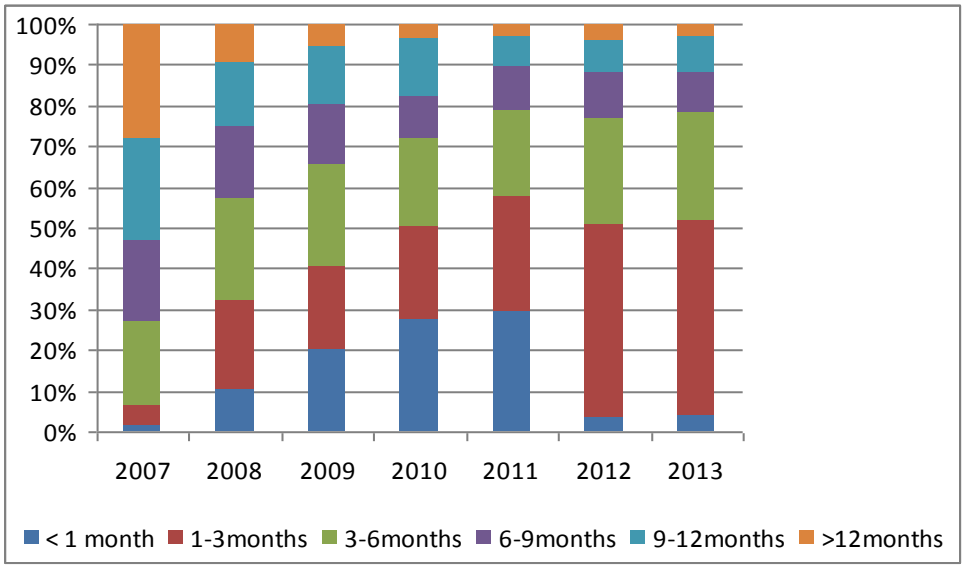


Figure 3: The distribution of the WMPs' maturity dates

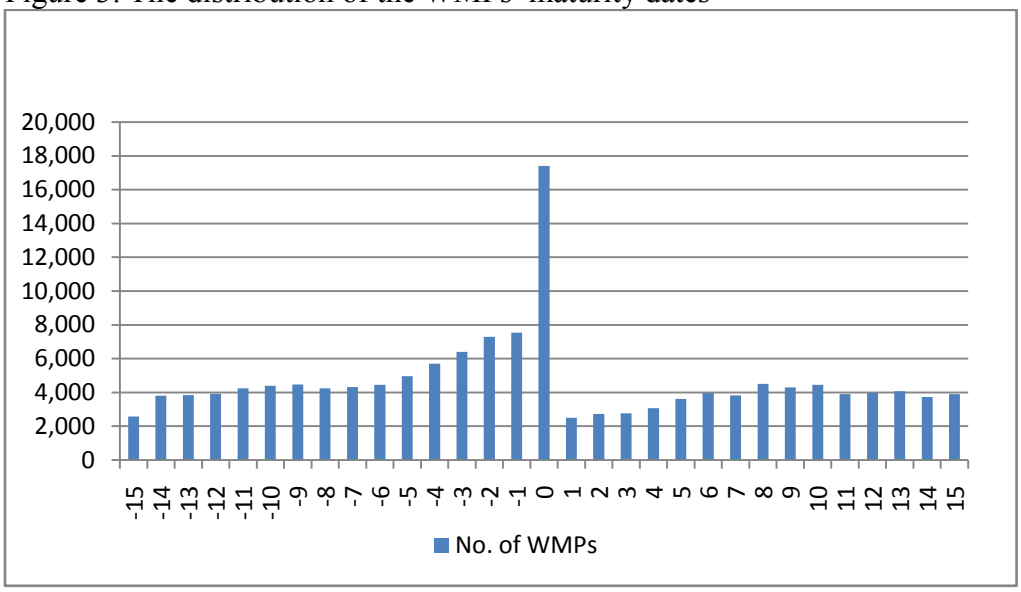


Figure 4: Percentages of WMPs expiring at a month-end and on the days of [-4,0]

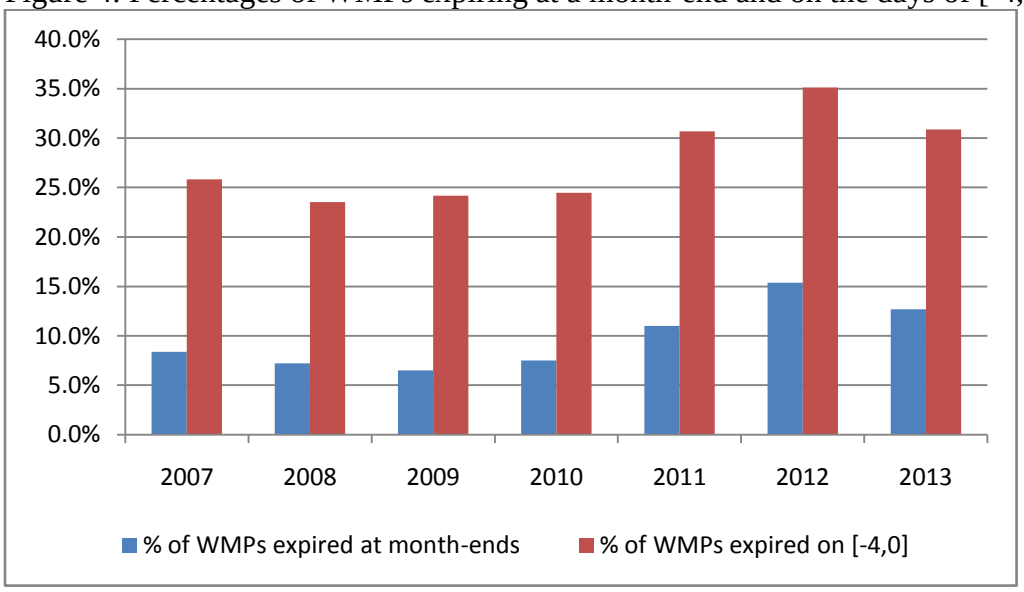
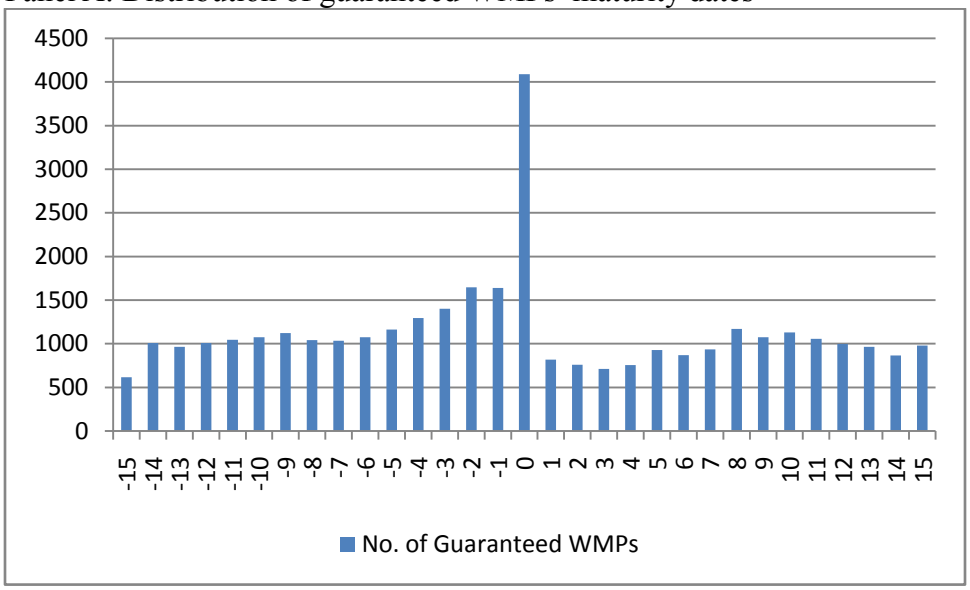


Figure 5: Distribution of the maturity dates for guaranteed and non-guaranteed WMPs

Panel A: Distribution of guaranteed WMPs' maturity dates



Panel B: Distribution of non-guaranteed WMPs' maturity dates

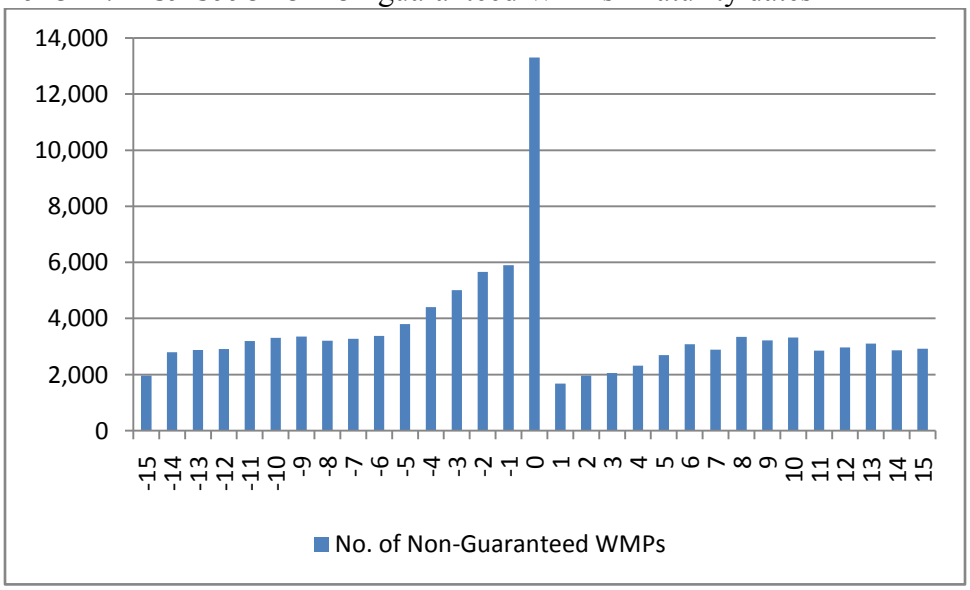


Table 1: Summary statistics and correlations

Panel A: Summary Statistics

	Mean	Std.Dev	Median	Min	Max	N
LDR	65.497	9.762	67.951	27.366	94.487	512
log_num WMPs expiring on [-4,0]	1.673	1.184	1.609	0.000	4.905	512
log_num WMPs expiring on other days	2.621	1.274	2.708	0.000	5.081	465
Bank size (log total assets)	26.704	1.338	26.659	23.880	29.022	512
levevage	17.269	4.610	16.717	6.066	45.191	512
npl	0.928	0.609	0.830	0.090	9.560	475

Panel B: Correlations between variables

N=512	LDR	log_num WMPs expiring on [-4,0]	log_num WMPs expiring on other days	Bank size (log total assets)	levevage	NPL
LDR	1					
log_num WMPs expiring on [-4,0]	0.093	1				
log_num WMPs expiring on other days	0.259	0.678	1			
Bank size (log total assets)	0.455	0.591	0.700	1		
levevage	0.165	0.067	0.131	0.369	1	
NPL	-0.043	-0.136	-0.150	-0.174	0.016	1

Table 2

Panel A:

Estimation	OLS	OLS	RE	RE	FE	FE	FE(FD)	FE(FD)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Log (No. of WMPs)	-1.412***	-1.272 ***	-1.084 ***	-1.055 ***	-0.836***	-0.772 ***	-1.130 ***	-0.958***
	(0.426)	(0.427)	(0.236)	(0.260)	(0.239)	(0.261)	(0.243)	(0.260)
Log (Assets)	3.598***	4.141 ***	-1.384 **	-1.099 *	-2.598 ***	-2.835 ***	-10.98 ***	-12.27***
	(0.389)	(0.411)	(0.542)	(0.580)	(0.596)	(0.666)	(1.668)	(1.885)
Leverage		-0.279***		0.068		0.046		0.167 **
		(0.094)		(0.064)		(0.064)		(0.068)
NPL		0.132		-0.230		-0.535		-0.060
		(0.654)		(0.385)		(0.384)		(0.391)
Time Fixed	Y	Y	N	N	N	N	Y	Y
Banks	71	70	71	70	71	70	71	70
Observations	512	475	512	475	512	475	512	475
R-squared	0.299	0.337	0.117	0.134	0.164	0.213	0.871	0.871

Table 2
Panel B:

Estimation	OLS	OLS	RE	RE	FE	FE	FE(FD)	FE(FD)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Log (No. of WMPs)	0.118	-0.193	-0.413	-0.474	0.059	0.049	-0.073	0.115
	(0.420)	(0.436)	(0.296)	(0.321)	(0.307)	(0.330)	(0.313)	(0.337)
Log (Assets)	2.520***	3.287***	-2.559 ***	-2.213 ***	-4.624 ***	-4.714 ***	-9.264 ***	-9.84 ***
	(0.437)	(0.482)	(0.661)	(0.693)	(0.746)	(0.796)	(1.700)	(2.048)
Leverage		-0.392***		-0.199		-1.234		0.040
		(0.103)		(0.079)		(0.078)		(0.087)
NPL		-0.058		-0.147		-0.348		0.067
		(0.464)		(0.315)		(0.307)		(0.313)
Time Fixed	Y	Y	N	N	N	N	Y	Y
Banks	75	75	75	75	75	75	75	75
Observations	573	530	573	530	573	530	573	530
R-squared	0.233	0.266	0.145	0.160	0.153	0.171	0.814	0.813

Table 3

Panel A:

Estimation	OLS	OLS	RE	RE	FE	FE	FE(FD)	FE(FD)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Log (No. of WMPs)	-1.124 **	-0.961 **	-1.080***	-1.042 ***	-0.753***	-0.671 **	-0.963 ***	-0.816 ***
	(0.463)	(0.458)	(0.254)	(0.272)	(0.256)	(0.271)	(0.259)	(0.272)
Log (Assets)	3.460 ***	4.123 ***	-1.649 ***	-1.083 *	-3.674 ***	-3.653***	-9.947 ***	-12.11***
	(0.417)	(0.434)	(0.627)	(0.636)	(0.718)	(0.766)	(1.857)	(2.145)
Leverage		-0.411 ***		0.120		0.087		0.223 **
		(0.116)		(0.077)		(0.077)		(0.088)
NPL		0.379		0.016		-0.089		-0.079
		(0.701)		(0.435)		(0.426)		(0.411)
Time Fixed	Y	Y	N	N	N	N	Y	Y
Banks	70	69	70	69	70	69	70	69
Observations	465	436	465	436	465	436	465	436
R-squared	0.272	0.322	0.142	0.151	0.182	0.230	0.878	0.879

Table 3

Panel B:

Estimation	OLS	OLS	RE	RE	FE	FE	FE(FD)	FE(FD)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Log (No. of WMPs)	-1.346 ***	-1.228 ***	1.122***	-1.100 ***	-0.882***	-0.823 ***	-1.16 ***	-0.99***
	(0.424)	(0.425)	(0.235)	(0.258)	(0.238)	(0.260)	(0.242)	(0.258)
Log (Assets)	3.573***	4.130 ***	-1.314 **	-1.036 *	-2.499***	-2.740 ***	-11.03***	-12.29***
	(0.388)	(0.411)	(0.543)	(0.581)	(0.597)	(0.667)	(1.676)	(1.893)
Leverage		-0.274 ***		0.064		0.044		0.168 **
		(0.094)		(0.064)		(0.064)		(0.068)
NPL		0.162		-0.214		-0.514		-0.036
		(0.654)		(0.386)		(0.385)		(0.392)
Time Fixed	Y	Y	N	N	N	N	Y	Y
Banks	71	70	71	70	71	70	71	70
Observations	508	472	508	472	508	472	508	472
R-squared	0.300	0.340	0.113	0.128	0.161	0.211	0.871	0.872

Table 3
Panel C:

Estimation	OLS	OLS	RE	RE	FE	FE	FE(FD)	FE(FD)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Log (No. of WMPs)	-1.252***	-1.175***	-0.720***	-0.755***	-0.471**	-0.484*	-0.706***	-0.611**
	(0.406)	(0.403)	(0.238)	(0.256)	(0.238)	(0.254)	(0.241)	(0.252)
Log (Assets)	3.613***	4.251***	-1.972***	-1.471***	-3.358***	-3.497***	-12.329***	-14.042***
	(0.364)	(0.384)	(0.537)	(0.571)	(0.587)	(0.658)	(1.773)	(2.047)
Leverage		-0.254***		0.107*		0.073		0.210***
		(0.093)		(0.065)		(0.065)		(0.070)
NPL		0.022		-0.504		-0.902**		-0.350
		(0.654)		(0.418)		(0.417)		(0.427)
Time Fixed	Y	Y	N	N	N	N	Y	Y
Banks	69	68	69	68	69	68	69	68
Observations	480	445	480	445	480	445	480	445
R-squared	0.326	0.371	0.178	0.195	0.210	0.265	0.868	0.870

Table 3
Panel D:

Estimation	OLS	OLS	RE	RE	FE	FE	FE(FD)	FE(FD)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Log (No. of WMPs)	-1.118 ***	-1.056 **	-.943 ***	-.895 ***	-.652***	-.550 **	-.849 ***	-.696***
	(0.422)	(0.425)	(0.235)	(0.257)	(0.241)	(0.261)	(0.242)	(0.254)
Log (Assets)	3.411***	4.019***	-1.308**	-1.037 *	-2.615 ***	-2.759 ***	-9.419***	-12.13***
	(0.393)	(0.420)	(0.546)	(0.584)	(0.607)	(0.671)	(1.627)	(1.843)
Leverage		-.284***		0.077		0.068		.191 ***
		(0.091)		(0.062)		(0.062)		(0.066)
NPL		0.328		-0.114		-0.407		0.039
		(0.627)		(0.366)		(0.365)		(0.370)
Time Fixed	Y	Y	N	N	N	N	Y	Y
Banks	73	73	73	73	73	73	73	73
Observations	541	501	541	501	541	501	541	501
R-squared	0.291	0.331	0.124	0.141	0.170	0.218	0.866	0.870