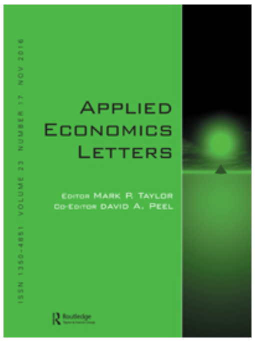

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The price of deposit liquidity: banks versus microfinance institutions

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ABSTRACT
Using data from Bangladesh, this article finds that the liquidity premium – the difference between the interest paid on illiquid and liquid savings accounts – is higher in commercial banks than in microfinance institutions. One possible interpretation lies in the higher prevalence of time-inconsistency among the poor. The observed difference in liquidity premia could be due to poor time-inconsistent agents willing to forgo interest on illiquid savings accounts in order to discipline their future selves.

KEYWORDS
Liquidity premium; present-bias; banks; microfinance; Bangladesh

JEL CLASSIFICATION
G21; D14; O16

I. Introduction

Economic agents with time-inconsistent preferences are tempted to under-save and over-consume (O'Donoghue and Rabin 1999). To enforce self-discipline, these agents can use illiquid deposits that have embedded commitment devices against early withdrawal (Laibson 1997). Although the presence of time-inconsistent agents is well established (DellaVigna 2009), surprisingly little is known about their impact on deposit remuneration in general, and on the liquidity premium – the interest spread between illiquid and liquid deposits – in particular.

We use data from Bangladesh to explore how savers' time-inconsistency affects the liquidity premium. Since time-inconsistency is unobservable, we rely on the literature concluding that time-inconsistent agents are found more frequently in poor populations than elsewhere. To explain the prevalence of time-inconsistency in poor populations, Bertrand, Mullainathan, and Shafir (2004) and Banerjee and Mullainathan (2010) emphasize that the poor constantly face stressful expenditure decisions involving harmful trade-offs and conflicts.

In addition, experimental evidence suggests that poor people are not only time-inconsistent; they are also aware of the fact. For example, households in Bangladesh accept negative returns on illiquid savings schemes proposed by informal deposit collectors (Rutherford 2000). Lacking commitment savings products, Indian women bind themselves through microcredit contracts (Bauer, Chytilová, and Morduch 2012).[1] Overall, poverty damages the ability to exercise self-control, and the consequences of giving in to temptation are harsher for poor individuals than for wealthy ones (Bernheim, Ray, and Yeltekin 2015). Section II exploits this evidence.

II. The liquidity premium in Bangladesh

In Bangladesh, the banking sector is fully segmented: regular banks serve nonpoor depositors while microfinance institutions (MFIs) offer savings accounts to the poor. Both take liquid and illiquid deposits. The no-maturity liquid deposits ('savings deposits') place no restrictions on withdrawals, deposits or transfers. In contrast, illiquid deposits entail severe restrictions for cash inflows and/or outflows. Illiquid deposits are classified in two groups: recurring and term deposits. Recurring deposits are made up of regular payments, and withdrawals are forbidden prior to maturity or before a target balance has been reached. A term deposit consists of a single lump-sum

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[1]Interestingly, these findings are gender-sensitive. Dupas and Robinson (2013) find that most women actively take up the savings account offered by a village bank in Kenya while men do not. Possibly, women are more attracted to accessible commitment devices than men are because they are poorer than men on average, enjoy less autonomy in financial decision-making (Guérin 2006), and are sometimes discriminated against by financial institutions (Agier and Szafarz 2013).

payment with a fixed maturity. Term deposits are commonly offered to wealthy savers, and recurring deposits to the poor. In MFIs, recurring deposits are placed in so-called 'contractual' savings accounts, which help poor people to accumulate money (Rutherford 2000).

According to the Bangladeshi Central Bank (www.bangladesh-bank.org), the country has 47 regulated banks.[2] We collected saving conditions for 28 of them from their websites. The market for micro-savings in Bangladesh is made up of six large MFIs, which attract 83% of total domestic micro-savings (Microcredit Regulatory Authority 2011), and a myriad small ones. We found interest-rate data on the websites of five MFIs, including three of the six largest ones. Surprisingly, Grameen Bank, the largest MFI in Bangladesh, gives only partial information on its website. Fortunately, other sources (Dowla and Alamgir 2003; Rutherford, Maniruzzaman, and Sinha 2004) provide data on Grameen's savings conditions. Overall, the five MFIs for which we managed to obtain complete data represent 64% of total micro-savings in Bangladesh.[3]

Tables 1 and 2 summarize the information we collected for banks and MFIs, respectively. For each financial institution, the tables give the following information: interest on liquid deposits, and minimum and maximum interest rates for recurring and term deposits, respectively. With these two types of illiquid accounts, interest rates increase with maturity, so the tables feature intervals rather than single figures. Averages are computed by using interval midpoints. In each class of deposits, the interest rates vary across institutions, and there is no clear-cut distinction between banks and MFIs. In contrast, the average liquidity premiums are 6.4% for banks and 3.7% for MFIs. A t-test for equal means shows that the two groups of institutions offer significantly different liquidity premiums ($p < 1\%$).

To assess the preliminary findings from descriptive statistics, we run the following ordinary least squares (OLS) regression:

$$LP_i = \alpha + \beta MFI_i + \gamma \boldsymbol{X}_i + \varepsilon_i \qquad (1)$$

where LP_i is the liquidity premium of institution i; MFI is a dummy variable that takes value 1 if the institution is an MFI, and 0 otherwise; $\boldsymbol{X}_i$ is a vector of control variables, including total asset (in log),[4] and dummy variables for ownership (private or public) and religious orientation (Islamic or non-Islamic). In our sample, banks and MFIs are both regulated. Banks are supervised by the Bangladeshi Central Bank, while MFIs are monitored by the Microcredit Regulatory Authority. The MFIs are all privately owned and conventional. Four banks are public institutions, meaning that the Government of Bangladesh holds at least 50% of the property rights; the remaining banks are privately owned. Four banks are Islamic or Sharia-based.[5]

Table 3 reports the results of the OLS regressions as well as diagnostic statistics. It shows that, despite the limited sample size, the coefficient of the MFI dummy is always negative and significant at the 5% level (even at the 1% level in four out of six regressions). The relevance of the specifications is attested by significant F-test statistics. The Shapiro–Wilk and Breusch–Pagan test statistics indicate that the normality and homoscedasticity of the residuals cannot be rejected, respectively. For robustness and given the small sample size, the Appendix reports bootstrapped p-values, which broadly confirm the conclusions drawn from Table 3. Moreover, as far as robustness is concerned, specification (5) dominates specification (6).

Table 3 reveals that, all else equal, the microfinance liquidity premium is around 2.5 basis points below that of banks. Possibly, the difference stems from the pool of depositors with whom the two types of institutions work. In line with the theory linking time-inconsistency to poverty, MFIs would attract a larger share of time-inconsistent depositors than would mainstream banks. As a result, they would also collect a larger amount in illiquid deposits, and therefore be less exposed to the risk of bank run.

[2]Data collected in June 2012.
[3]Admittedly, the sample could be subject to a selection bias since it is confined to institutions that publicize their savings conditions.
[4]The data on total assets were retrieved as of 31 December 2011 for all institutions except Rajshahi Krishi Unnayan Bank, Bangladesh Krishi Bank, SafeSave, Jagorani Chakra Foundation (as of 30 June 2011), and Buro and Grameen Bank (as of 31 December 2010).
[5]All Islamic banks are private.

Table 1. Interest rates on deposits in Bangladeshi banks.

	Interest rate on liquid deposits (%)[a]	Interest rate on illiquid deposits (%)[a]	Liquidity premium (%) Min.	Liquidity premium (%) Max.
AB Bank	6.00	12.00–12.50 (t)	6.00	6.50
Agrani Bank	4.00	7.00–9.00 (r)	3.00	5.00
		10.00–12.50 (t)	6.00	8.50
Bangladesh Krishi Bank	6.00[b]	10.00–15.00 (r)	4.00	9.00
		11.00–12.50 (t)	5.00	6.50
Asia Bank	5.50	10.00–12.00 (t)	4.50	6.50
Basic Bank	7.00	12.50 (t)	5.50	5.50
BRAC Bank	4.00	7.00–10.00 (t)	3.00	6.00
Dhaka Bank	6.25[c]	12.50 (t)	6.25	6.25
Eastern Bank	6.00	10.50–12.50 (t)	4.50	6.50
Exim Bank	5.00	11.00–12.00 (r)	6.00	7.00
		12.50 (t)	7.50	7.50
ICB Islamic Bank	5.00	10.50–11.50 (r)	5.50	6.50
		12.00–12.50 (t)	7.00	7.50
IFIC Bank	5.00	12.00 (r)	7.00	7.00
		12.50 (t)	7.50	7.50
Mercantile Bank	6.00	12.50 (t)	6.50	6.50
Mutual Trust Bank	6.00	12.50 (t)	6.50	6.50
National Bank	4.00	9.00–9.50 (r)	5.00	5.50
		10.50–12.00 (t)	6.50	8.00
National Bank of Pakistan	5.00	11.25–12.25 (r)	6.25	7.25
National Credit & Commerce Bank	6.00	10.00–12.50 (t)	4.00	6.50
One Bank	6.00	12.50 (t)	6.50	6.50
Pubali Bank	4.50	10.00–12.00 (r)	5.50	7.50
		8.00–12.00 (t)	3.50	7.50
Rajshahi Krishi Unnayan Bank	6.00[b]	9.00 (r)	3.00	3.00
		8.00–9.50 (t)	2.00	3.50
Shahjalal Bank	4.00	12.05–12.30 (r)	8.05	8.30
		12.00–12.50 (t)	8.00	8.50
Social Islami Bank	4.00	13.50 (r)	9.50	9.50
Standard Bank	5.00	12.00 (t)	7.00	7.00
Standard Chartered Bank	2.00	6.25–12.50 (t)	4.25	10.50
The City Bank	4.00	10.00–12.50 (t)	6.00	8.50
HSBC Bangladesh	1.50	6.25–11.00 (t)	4.75	9.50
Trust Bank	6.00	7.78 (r)	1.78	1.78
		7.00–12.50 (t)	1.00	6.50
United Commercial Bank	4.50	12.50 (t)	8.00	8.00
Uttara Bank	4.50	12.50 (t)	8.00	8.00
Average	4.96	10.26–11.32 (r)	6.38	
		10.58–12.15 (t)		

[a]Data Retrieved in June 2012.
[b]Average of urban and rural interest rates.
[c]Average of conventional and Islamic interest rates.
(r): Recurring deposit; (t): Term deposit.

However, commercial banks and MFIs differ in several ways other than the proportion of time-consistent agents. First, the market powers of banks and MFIs may differ. A higher market power could explain why MFIs exhibit a lower liquidity premium than banks do. Interestingly, our descriptive statistics show that banks and MFIs pay similar interest rates on liquid deposits, so that the difference in liquidity premia comes from illiquid interest rates. This observation is consistent with the theory stating that poor people are willing to forgo interest on liquid accounts in exchange for a disciplining device taking the form of illiquid deposit. Another argument against the market-power explanation is that, according to Table 3, Islamic banks tend to have higher liquidity premia than non-Islamic banks, whereas according to Weill (2011) they exhibit no significant difference in terms of market power.

Table 2. Interest rates on deposits in Bangladeshi MFIs.

	Interest rate on liquid deposits (%)[a]	Interest rate on illiquid deposits (%)[a]	Liquidity premium (%) Min.	Liquidity premium (%) Max.
Grameen Bank	8.50	10.00–12.00 (r)	1.50	3.50
		8.75–9.50 (t)	0.25	1.00
ASA	6.00	9.00–12.00 (r)	3.00	6.00
Buro	4.50	6.00–8.00 (r)	1.50	3.50
SafeSave	6.00	7.00–10.00 (r)	1.00	4.00
Jagorani Chakra Foundation	5.00	10.00–12.00 (r)	5.00	7.00
		14.00 (t)	9.00	9.00
Average	6.00	8.40–10.80 (r)	3.68	
		11.38–11.75 (t)		

[a]Data retrieved in June 2012.
(r): Recurring deposit; (t): Term deposit.

Table 3. Liquidity Premium.

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable	Average liquidity premium					
MFI	−0.0271***	−0.0250**	−0.0292***	−0.0263***	−0.0248***	−0.0212**
	(0.0072)	(0.0094)	(0.0070)	(0.009 1)	(0.0069)	(0.0091)
Total asset (takas, in log)		0.0008		0.0011		0.0014
		(0.0023)		(0.0022)		(0.0022)
Public bank			−0.0147*	−0.0150*		
			(0.0077)	(0.0078)		
Islamic bank					0.0159**	0.0165**
					(0.0076)	(0.0078)
Constant	0.0638***	0.0432	0.0659***	0.0377	0.0616***	0.0266
	(0.0028)	(0.0580)	(0.0029)	(0.0556)	(0.0029)	(0.0554)
Observations	33	33	33	33	33	33
Adj. R^2	0.2904	0.2699	0.346	0.3294	0.360 1	0.347
F-test	14.10***	6.9 1***	9.47***	6.24***	10.00***	6.67***
Shapiro–Wilk test	−0.528	−0.262	−0.689	−0.04	−1.428	−1.014
Breusch–Pagan test	1.49	1.53	2.51	2.33	2. 16	2.41

Note: Table 3 reports the results of OLS regressions. In all specifications, the dependent variable is the average liquidity premium (i.e. average between minimum liquidity premium and maximum liquidity premium). The *MFI* dummy variable indicates whether the institution is an MFI. In columns (2)–(6), we add control variables: total asset (in log), ownership and religious orientation. In columns (3) and (4), the reference modality is 'private bank'; in columns (5) and (6), it is 'conventional bank.' SEs appear in parentheses. Level of significance: ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$. All financial figures are in takas. 80 takas = about 1 US dollar.

Second, differences in contract terms, such as the maturity of illiquid deposits, may play a role. Third, MFIs differ from commercial banks not only in the population they serve, but also in their strategic choices. Conning and Morduch (2011) mention that the government and socially oriented investors have a strong influence on MFI decision-making. Undeniably, the impacts of contract terms and stakeholders' strategic decisions on the liquidity premium deserve further analysis. Capturing such impacts would however require access to detailed data, which are unavailable publicly.

III. Conclusion

Evidence from nonbanking firms shows that time-inconsistent agents have a sizeable impact on prices (DellaVigna and Malmendier 2004). But in banking, evidence is lacking. Our exploratory results suggest that the liquidity premium varies with the clientele targeted by the financial institution (the poor vs. the non-poor). This may indicate a significant link between savers' time-inconsistency and the liquidity premium. However, market power and contract terms can also tell part of the story.

Regarding the external validity of our results, we contend that the lessons to be learned from Bangladesh are also relevant for many other developing – and even developed – countries. In Bangladesh, the penetration of foreign banks is high (Clarke et al. 2003) and banks in general enjoy significant market power (Assefa, Hermes, and Meesters 2013), like in many jurisdictions worldwide (Claessens and Laeven 2004).[6]

Further work is needed not only to robustify our initial findings, but also to derive practical recommendations in terms of banking regulation and monitoring. This is a matter of considerable importance nowadays.

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[6]In theory, since illiquid savings protect a bank against liquidity shortages and since competitive markets reward deposits at their marginal benefit, the liquidity premium in a competitive market should be unaffected by the demand side. In contrast, if a bank enjoys market power, it can exploit the savers' reservation prices, and the liquidity premium would depend negatively on the proportion of time-inconsistent agents among the savers (Laureti and Szafarz 2014).

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Appendix

Table A1 reports bootstrapped *p*-values for the impact of the *MFI* dummy variable. These *p*-values are obtained by generating 1,000 samples (with replacement) from the original dataset. We use three different techniques: (a) standard bootstrap, (b) stratified bootstrap, where the MFIs and banks are resampled independently, (c) wild bootstrap, which resamples from (transformed) residuals. The wild bootstrap technique is especially recommended when the standard errors are heteroscedastic (Flachaire 2005; Davidson and MacKinnon 1999). Except for specification (6), the generated *p*-values suggest that the results given in Table 3 are robust. In this respect, specification (5) is probably more suitable than (6), for which Table 3 features two nonsignificant coefficients.

Table A1. Bootstrapped *p*-values for the *MFI* dummy variable.

	(l)	(2)	(3)	(4)	(5)	(6)
(a) Boostrap (with case resampling)	0.005	0.089	0.003	0.066	0.010	0.185
(b) Boostrap with stratified sampling	0.002	0.041	0.001	0.028	0.004	0.105
(c) Wild bootstrap	0.044	0.128	0.038	0.112	0.046	0.210

Notes: The *MFI* dummy variable takes value 1 if the institution is an MFI, and 0 otherwise. The columns (1)–(6) refer to the corresponding regressions in Table 3.