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Discretionary loan loss provisions and market discipline

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Abstract

Using a panel of 375 American universal commercial banks from 2008 to 2017, we provide empirical evidence that discretionary loan loss provisions increase when market discipline -- proxied by deposit rates -- strengthens. In particular, least-capitalized banks increase more their discretionary loan loss provisions following an increase in deposit rates than other banks do. Loan loss provisions can thus act as a substitute for capital to respond to market discipline. This result partly qualifies the enthusiasm raised by the implementation of forward-looking provisioning models. These models indeed grant great discretion to banks in the setting of loan loss provisions since the valuation method underlying them is subject to uncertainty. In this perspective, regulators should make sure that the implementation of forward-looking provisioning models is not done in a way that would encourage banks to substitute provisions for capital, which would prove detrimental to market discipline.

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1 - Introduction

As soon as 2009, the Financial Stability Forum (FSF) noted that "earlier recognition of loan losses could have dampened cyclical moves in the current crisis" (FSF, 2009, p.4) and consequently called for a renewal of loan loss provisioning models. At that time, provisions were made according to a model that is commonly referred to as the incurred loss model both in the IFRS and in the US GAAP framework. Following the call of the FSF, accounting standards setters – both the International Accounting Standards Board (IASB) and the Financial Accounting Standards Board (FASB) – have begun to work on new standards concerning loan loss provisioning. Those standards rest on a forward-looking provisioning model and will come into effect between 2018 and 2021.

The philosophy of those models is that from the very moment a loan is granted, a provision that consists in the expected loss associated with this loan has to be created. While the incurred loss model gives banks few room for maneuver since loan loss provisions are directly related to contemporary problem loans, forward-looking provisioning models entirely rest on the computation of an expected credit loss. In other words, while the incurred loss model deals with what is known (i.e. actual information supported by objective evidence), forward-looking provisioning models deal with the future and thus with uncertainty. This uncertainty has therefore to be modeled, and risk models are used to compute the expected credit loss on which loan loss provisions are based. Those models are however subject to manipulations and could eventually lead to an underestimation of loan loss provisions (Mariathasan and Merrouche, 2014). In addition, the three-bucket approach introduced by IFRS 9 is not very clear concerning the circumstances under which an asset has to be transferred from one bucket to another. This adds to the discretionary power granted to banks subject to IFRS 9 when setting their loan loss provisions.

This paper studies the relationship between discretionary loan loss provisions and market discipline. It is a well-established result that strong market discipline translates into high capital buffers (Baumann and Nier, 2006). But when capital is costly and hard to raise, it may be difficult for banks to deal with market discipline by holding large capital buffers. In that case, depending on the discretion let to banks when setting their loan loss provisions, those provisions could act as a substitute for capital: when capital is scarce, banks can make provisions to signal their strength and thus to soften market discipline. We provide empirical evidence to support this idea. Using a panel of 375 American universal commercial banks from 2008 to 2017 we show that discretionary loan loss provisions are indeed increasing when deposit rates – which are considered as a proxy for market discipline – increase. Furthermore we show that least-capitalized banks increase more their loan loss provisions following an increase in their deposit rates than other banks do. To our knowledge, our paper is the first to empirically show that banks use their loan loss provisions to cope with market discipline. Accounting standards setters thus have to take into account the potential impact of accounting rules on market discipline. This suggests that accounting standard setters have to work hand in hand with prudential regulators.

This paper lies at the intersection between the literature on market discipline and that on loan loss provisions. Market discipline can be considered in two different ways (Bliss and Flannery, 2001; Stephanou, 2010; Bushman and Williams, 2012): a *direct* discipline that consists in the influence market participants themselves exert on banks' behavior and an *indirect* discipline that operates through regulatory interventions triggered by market signals. We are here particularly interested in the direct market discipline that depositors

exert over the behavior of banks. Deposit insurance may weaken this discipline since it disincentivizes depositors to monitor banks properly (Bartholdy *et al.*, 2001; Demirgüç-Kunt and Huizinga, 2004; Baumann and Nier, 2006; Forssbaeck, 2011). Contrary to insured depositors, uninsured depositors are in a position of suffering losses when the bank they invested their deposits in goes bankrupt. The latter have therefore the right incentives to prevent banks from taking excessive risks. Empirical works indeed provide evidence that such a discipline is exerted by uninsured depositors. This discipline is, on the one hand, exerted through prices since uninsured deposit rates are negatively correlated with banks' soundness (Hannan and Hanweck, 1988; Ellis and Flannery, 1992; Hess and Feng, 2007; Uchida and Satake, 2009). On the other hand, market discipline can materialize through quantities, i.e. through withdrawals (Billet *et al.*, 1998; Jagtiani and Lemieux, 2000; Maechler and McDill, 2006; Shimizu, 2009).

Accounting figures, including loan loss provisions, are built according to rules whose purpose is to provide the most faithful representation of reality. Applying those rules always involve managerial judgment and thus discretion. The literature thus traditionally splits loan loss provisions into two components: a *non-discretionary* component that accounts for identified losses associated with the loan portfolio, and a *discretionary* component. We are here particularly interested in the discretionary component. It is shown that discretionary loan loss provisions are essentially made for management purposes such as income smoothing, signaling or regulatory capital management (Beaver and Engel, 1996; Ahmed *et al.*, 1999; Kanagaretnam *et al.*, 2004). Recently, Tomy (2019) shows that banks may hide profits by increasing their loan loss provisions to deter competitors from entering the market. Bushman and Williams (2012) show that discretion in the setting of loan loss provisions – proxied by both delayed expected loss recognition and income smoothing – is associated with smaller changes in capital following an increase in banks' risk. Discretion here has an adverse impact on banks' behavior. In the same vein, Bushman and Williams (2015) show that delayed expected credit loss recognition is associated with larger downsize risk. In fact, as Bushman (2016) argues, accounting discretion is a double-edged sword: on the one hand, it makes it possible for banks' managers to rely more on their private information while setting loan loss provisions – which can have a positive impact on the quality of the information carried by loan loss provisions –; on the other hand, it allows for more opportunistic accounting behaviors.

The present paper bridges the gap between those two strands of the literature by showing that banks may use the discretionary component of their loan loss provisions to deal with market discipline. By doing so this paper illustrates the necessity to consider accounting and prudential issues together. Controlling for the non-discretionary component of loan loss provisions, we indeed provide evidence that banks respond to an increase in their deposit rate by increasing their loan loss provisions. In addition, the more a bank is capitalized, the less it tends to increase its loan loss provisions in response to an increase in its deposit rate. Banks that find it difficult to raise capital may therefore use their loan loss provisions as a signal to soften the market discipline they are subjected to. The next section presents tested hypotheses and data. Section 3 brings evidence that banks do resort to their loan loss provisions to face market discipline. Section 4 provides evidence that discretionary loan loss provisions are used as a substitute for regulatory capital. Section 5 concludes.

2 - Hypotheses, data and descriptive statistics

2.1 - Hypotheses

Depositors exert market discipline over banks. This discipline materializes through two channels: prices (i.e. deposit rates) and/or quantities (i.e. withdrawals). In order to soften this market discipline, banks may decide to raise more capital. Banks however often find it costly to hold large capital buffers. In this case, banks can instead increase their loan loss provisions to signal their soundness to their depositors. Those might indeed interpret higher provisions as a sign that the bank is sound and might thus demand lower deposit rates. This is hypothesis 1 (H1).

Hypothesis 1. *Banks increase their discretionary loan loss provisions to cope with market discipline.*

H1 is verified if one or both of the following statements holds true:

- discretionary loan loss provisions increase when deposit rates do,
- discretionary loan loss provisions increase when deposit withdrawals do.

The relationship between discretionary loan loss provisions and market discipline is however expected to be particularly strong when banks are weakly capitalized. Weakly-capitalized banks are indeed expected to be strongly constrained by market discipline and may be thus more incentivized than better-capitalized banks to soften this discipline through provisioning. In addition, weakly-capitalized banks are likely to find it more difficult than other banks to raise regulatory capital. In other words, loan loss provisions may be used as a substitute for capital by banks that find it particularly hard to raise capital. This is hypothesis 2 (H2).

Hypothesis 2. *Banks use their loan loss provisions as a substitute for regulatory capital to respond to market discipline. More precisely, weakly-capitalized banks rely more on discretionary loan loss provisions than better-capitalized banks to deal with market discipline.*

H2 is verified if one or both of the following statements holds true:

- well-capitalized banks increase less their discretionary loan loss provisions than less well-capitalized banks do when deposit rates increase,
- well-capitalized banks increase less their discretionary loan loss provisions than less well-capitalized banks do when deposit withdrawals increase.

H1 is tested in section 3 and H2 is confronted to the data in section 4.

2.2 - Data

We use a panel of 375 American universal commercial banks from 2008 to 2017. Data come from the Fitch Connect database. We only focus on universal commercial banks to ensure homogeneity among banks. The Fitch Connect database comprises 1076 American universal commercial banks. We deleted 701 banks because they fall at least in one of the following categories: their loans to assets ratio was below 5%, more than five years of time series observations were missing (this is by far the main reason for deletion), one of the variables presents extreme values. Tables 4 and 5 (see Appendices) respectively present the variables and descriptive statistics.

3 - Do banks deal with market discipline through discretionary provisioning?

3.1 - Preliminary analysis

We evaluate here whether H1 holds true or not. Among the variables described in Table 4, two can possibly account for market discipline: rd and DMM. On the one hand, the least depositors trust the bank they invest in (the riskier the bank appears), the higher is the return they demand. A higher value of rd is therefore indicative of stronger market discipline. On the other hand, the riskier a bank appears, the harder it will be for it to find short-term deposits: the stronger market discipline is, the smaller DMM is expected to be. Table 1 presents the correlation matrix for some variables. What is particularly worth noticing is the 0.1% significant positive correlation between variables LLP and rd, and the 0.1% significant negative correlation between variables LLP and DMM. If a higher (resp. smaller) value of rd (resp. DMM) is indicative of stronger market discipline, it seems that banks may indeed make more provisions when market discipline strengthens. This is consistent with H1. In addition, we notice that the correlation between $T1$ and LLP is both significant and negative, which is consistent with H2.

Table 1: Correlation matrix

	LLP	T1	rd	DMM
LLP	1			
T1	-0.180***	1		
rd	0.431***	0.00770	1	
DMM	-0.0783***	-0.118***	-0.0159	1

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

3.2 - System generalized method of moments

To investigate further the relevance of H1, we regress LLP on rd and DMM. To control for the non-discretionary component of loan loss provisions we include contemporary non performing loans NPL and charge-offs CO. We also control for the risk associated with the loan portfolio by including the loan rate i and for the return of the asset portfolio by including the return on average assets $ROAA$. We also include the Tier 1 regulatory capital ratio $T1$. Finally, we include the lagged dependent variable among explanatory variables to account for dynamic adjustments in loan loss provisions (Bouvatier and Lepetit, 2008). We therefore want to estimate the following equation:

$$\begin{aligned} LLP_{it} &= \alpha_0 + \alpha_1 LLP_{it-1} + \alpha_2 L_{it} + \alpha_3 D_{it} + \alpha_4 NPL_{it} + \alpha_5 CO_{it} + \alpha_6 T1_{it} \\ &\quad + \alpha_7 ROAA_{it} + \alpha_8 i_{it} + \alpha_9 DMM_{it} + \alpha_{10} rd_{it} + \sum_{l=2008}^{2017} \alpha_l \mathbf{1}_l + \varepsilon_{it}, \end{aligned} \tag{1}$$

where LLP_{it-1} is the lagged value of LLP_{it} and $\mathbf{1}_l$ with $l \in \{2008, ..., 2017\}$ are time dummies that are equal to 1 when $l = t$ and to 0 otherwise. To perform an unbiased estimation of equation (1) we resort to the system generalized method of moments (GMM)

estimator (Arellano and Bover, 1995; Blundell and Bond, 1998). We use orthogonal deviations instead of first differences to avoid losing too many observations. We perform both one-step and two-step GMM. In the first case, we ensure that standard errors are robust to heteroskedasticity and to autocorrelation. In the second case, we perform the Windmeijer correction (Windmeijer, 2005) to correct the downward bias in standard errors traditionally associated with two-step estimations. For H1 to be verified we need α_9 to be negative and significant and/or α_{10} to be positive and significant. Table 2 presents estimations of equation (1) using both one-step and two-step system-GMM.

Table 2: System-GMM estimations of equation (1)

	One-Step GMM		Two-Step GMM	
	LLP		LLP	
L.LLP	-0.219**	(0.033)	-0.169**	(0.037)
L	0.00444**	(0.036)	0.00366*	(0.058)
D	-0.00511*	(0.071)	-0.00522*	(0.075)
NPL	0.0286***	(0.001)	0.0294***	(0.001)
CO	0.621***	(0.000)	0.568***	(0.000)
T1	0.00101	(0.835)	-0.000332	(0.949)
ROAA	-0.162***	(0.000)	-0.155***	(0.000)
i	0.0978	(0.153)	0.0848	(0.200)
DMM	0.0342**	(0.021)	0.0320**	(0.029)
rd	0.667***	(0.000)	0.693***	(0.000)
Observations	3210		3210	
Instruments	23		23	
Hansen p	0.397		0.397	
Sargan p	0.100		0.100	
AR(1) p	0.00881		0.0168	
AR(2) p	0.630		0.347	

p-values in parentheses

* p<0.1, ** p<0.05, *** p<0.01

Temporal effects are taken into account but not reported in the table.

Let us focus on the two-step GMM estimation. The coefficient before variable DMM is significant at 5% and positive, which does not support the intuition according to which banks increase their provisions when short-term funds are harder to get. On the contrary, banks increase their provisions when they attract more short-term funding. This may be because banks become riskier when they attract more short-term funding and cope with this increased risk by provisioning.

The coefficient before rd is both positive and significant at 1%, which is in line with the idea that banks respond to an increase in their deposit rate by increasing their loan loss provisions. If we consider deposit rates as a proxy for market discipline, a stronger

market discipline therefore has a positive impact on loan loss provisions. Market discipline has, thus, an impact on loan loss provisions when it materializes through prices. H1 is thus verified.

4 - Loan loss provisions and regulatory capital: substitutes or complements?

Banks thus increase their loan loss provisions when market discipline strengthens. However the extent to which banks respond to market discipline through their provisions may be a function of their level of Tier 1 capital. This is hypothesis 2, which states that well-capitalized banks may be less incentivized than weakly-capitalized banks to use their loan loss provisions as a means to deal with market discipline. In this perspective, discretionary provisions and capital are seen as substitutes to respond to market discipline. To test whether this hypothesis holds true or not, we estimate the specific and the joint effects of capital and market discipline on discretionary loan loss provisions. We thus estimate the following equation:

$$\begin{aligned} LLP_{it} &= \alpha_0 + \alpha_1 LLP_{it-1} + \alpha_2 L_{it} + \alpha_3 D_{it} + \alpha_4 NPL_{it} + \alpha_5 CO_{it} + \alpha_6 T1_{it} \\ &\quad + \alpha_7 ROAA_{it} + \alpha_8 i_{it} + \alpha_9 DMM_{it} + \alpha_{10} rd_{it} + \alpha_{11} rd_{it} \# T1_{it} \\ &\quad + \alpha_{12} sq\_rd_{it} + \alpha_{13} sq\_T1_{it} + \sum_{l=2008}^{2017} \alpha_l \mathbf{1}_l + \varepsilon_{it}, \end{aligned} \tag{2}$$

where $rd_{it}\#T1_{it}$ represents the interaction between variables rd_{it} and $T1_{it}$, sq_rd_{it} is the square of rd_{it} and sq_T1_{it} is the square of $T1_{it}$. We include the squared variables since the rationale behind the interaction term is derived from a Taylor approximation. Results are presented in Table 3. We notice that the coefficient before the interaction term is both significant and negative. This is consistent with the idea that the more a bank is capitalized, the less it tends to deal with market discipline by increasing its loan loss provisions.

Table 3: System-GMM estimations of equation (2)

	One-Step GMM		Two-Step GMM	
	LLP		LLP	
L.LLP	-0.349***	(0.000)	-0.285***	(0.000)
L	0.00764***	(0.001)	0.00709***	(0.003)
D	0.0284	(0.135)	0.0407**	(0.031)
NPL	0.0156**	(0.049)	0.0143*	(0.068)
CO	0.748***	(0.000)	0.697***	(0.000)
ROAA	-0.104***	(0.003)	-0.101***	(0.002)
i	0.0116	(0.891)	0.0329	(0.697)
DMM	0.0239	(0.110)	0.0238*	(0.069)
rd	0.874***	(0.004)	0.727**	(0.019)
T1	0.0565	(0.232)	0.0550	(0.299)
rd#T1	-2.436***	(0.001)	-2.178***	(0.002)
sq_rd	2.213	(0.871)	11.52	(0.394)
sq_T1	-0.0580	(0.494)	-0.0596	(0.557)
Observations	3210		3210	
Instruments	29		29	
Hansen p	0.705		0.705	
Sargan p	0.101		0.101	
AR(1) p	0.0199		0.0157	
AR(2) p	0.747		0.548	

p-values in parentheses

* p<0.1, ** p<0.05, *** p<0.01

Temporal effects are taken into account but not reported in the table.

To determine to what extent the level of Tier 1 capital impacts the provisioning behavior of banks, we compute the average marginal effects of an increase in r_d on LLP depending on the level of $T1$. Results are presented in Figures 1 and 2. We notice that in accordance with hypothesis 2, least capitalized banks increase more their loan loss provisions to respond to an increase in the return demanded by their depositors than better capitalized banks do. H2 is thus verified.

Figure 1: Average marginal effects of r_d on LLP depending on $T1$ (one-step estimation)

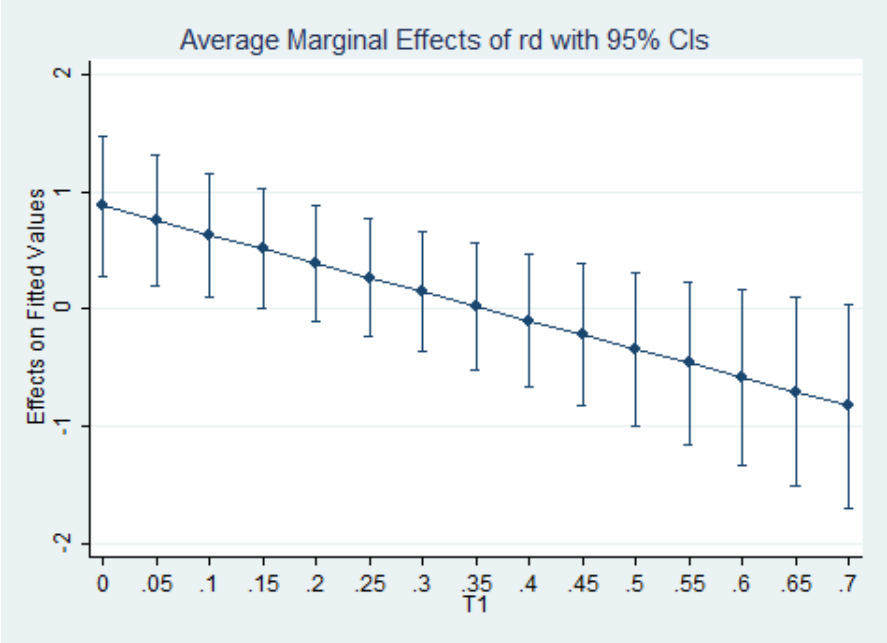
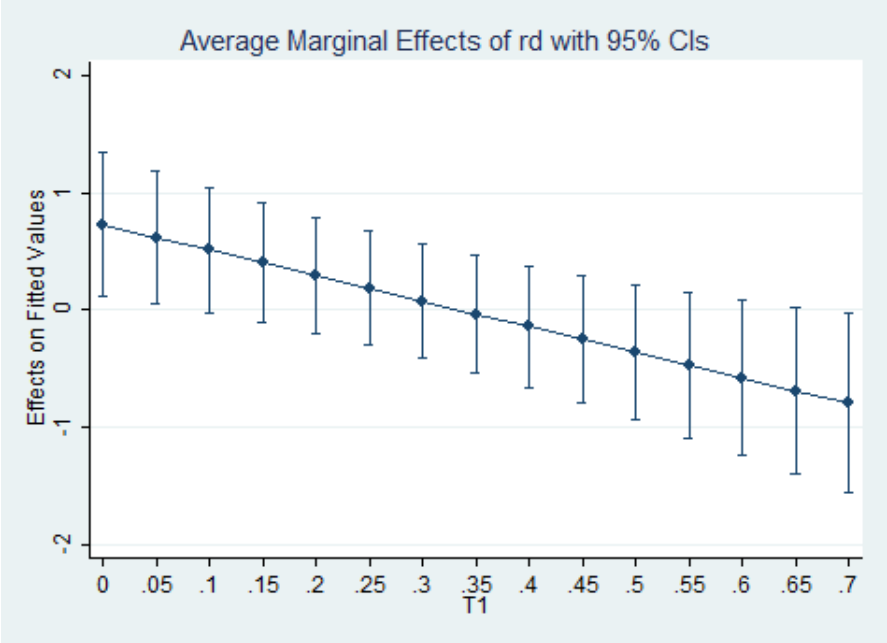


Figure 2: Average marginal effects of r_d on LLP depending on $T1$ (two-step estimation)



5 - Conclusion

This paper studies whether banks use their loan loss provisions to deal with market discipline. Using a panel data of 375 American universal commercial banks we indeed show that loan loss provisions increase when deposit rates do. In addition, we show that best-capitalized banks tend to increase their loan loss provisions in a lesser extent than other banks do when market discipline strengthens. This is in line with the intuition according to which provisions are used as a substitute for capital to deal with an increase in market discipline when capital is hard to raise.

This result is neither good news nor bad news. On the one hand, the possibility banks have to make such discretionary loan loss provisions can help market discipline work efficiently since it incentivizes weakly-capitalized banks to provision more – and thus to limit their risk exposure. On the other hand, it could disincentivize banks to raise more capital to deal with market discipline since this could be done through an increase in loan loss provisions. Discretionary provisioning is therefore a double-edged sword. The implementation of forward-looking provisioning models, as put forward by the IASB and the FASB, should thus be done cautiously. If more discretion is to be granted to banks' managers because of the valuation uncertainty and of the subjectivity inherent to the models used to compute expected credit losses, regulators should cautiously monitor that it is not done in a way that would encourage banks to substitute loan loss provisions for capital, which would prove detrimental to market discipline. It is therefore in the best interest of both accounting standards setters and prudential regulators to work together.

6 - Appendices

Table 4: Definition of the variables

LLP	loan loss provisions / total assets
L	loans / total assets
D	deposits / total assets
NPL	non performing loans / gross loans
CO	net charge-offs / gross loans
$T1$	Tier 1 regulatory capital ratio
$ROAA$	return on average asset
i	interest income on loans / average gross loans
rd	interest expense on customer deposits / average customer deposits
DMM	deposits and money market funding growth

Table 5: Descriptive statistics

	mean	sd	min	max
LLP	.0044669	.0083514	-.0232038	.1230964
L	.6195642	.1497219	.0547	.9552
D	.7999163	.0860682	0	.9559
NPL	.0253148	.0290483	0	.307
CO	.0068694	.0117486	-.026	.187
T1	.1497534	.0676613	.0242	.6519
ROAA	.006973	.0101209	-.112	.0852
i	.0517191	.0126766	.0052	.1536
rd	.0062535	.0053114	0	.04
DMM	.0572418	.1230726	-.4764	.999
N	3253			

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