Visible Reserves in Banks

Determinants of Initial Creation, Usage and Contribution to Bank Stability

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* Note that the opinions expressed in this presentation are those of the authors alone and do not necessarily reflect the views of the Deutsche Bundesbank or its staff.

Visible Reserves in Banks – Determinants of Initial Creation, Usage, and Contribution to Bank Stability – Introduction

GBR Reserves

- General Bank Risk (GBR) reserves are designed to foster banks' stability and to increase transparency in financial reporting
- In the past 15 years GBR reserves gained of importance
  → share of banks using them increased to some 50%

Initial Creation and Use

- Creation and use of GBR reserves gives considerable amount of discretion to the bank management
- Analyses by bank groups reveal that GBR reserves are created and used for several reasons

Influence on Bank Stability

- Strong negative relationship between GBR reserves and future bank distress and bank default events
- Outright bank defaults are rare in Germany
  → analysis is based on weaker forms of bank distress (e.g., capital support measures) as well as restructuring mergers

Visible Reserves in Banks – Determinants of Initial Creation, Usage, and Contribution to Bank Stability – Theoretical Background

Related Literature

- **Studies on GBR reserves**
  - Waschbusch (1994)
  - Emmerich and Reus (1995)
  - Wagener et al. (1995)

- **Bank stability related studies**
  - Cole and Gunther (1995)
  - Porath (2006)
  - Kick and Koetter (2007)
  - Kick and Prieto (2013)

Studies referring to Loan Loss Provisions are closely related to our work (e.g., earnings management, capital management, …)

Characteristics of GBR reserves

- Introduced in German law via section **§ 340g HGB**

- Built up from **net income before the owners decide** about the **appropriation of yearly annual surplus**

- Disclosed as a **separate item on the liability side** of banks' balance sheets

- Level of GBR is **not restricted to any quantitative limit** as long as amount is "reasonable"

- GBR reserves display **key features of equity** (CET-1 capital)

- In addition to GBR reserves, German banks can create **"hidden reserves" (§ 340f HGB)** to cover general banking risks

Data and Structure of German banking market

- **Bank data** is provided by the Bundesbank's prudential data base **BAKIS** covering the period **1994 – 2011**

- **Cooperative bank sector**
  - Sole source of **core equity** of these banks are the **cooperative shares** held **by their members**
  - Lack of institutional investors

- **Savings bank sector**
  - Usually owned by **one or a small number of municipalities (or counties)** in the region which are the only equity providers

- **Private bank sector**
  - **Heterogeneous** with respect to **ownership structure**

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– GBR reserves by bank category and year (mean)
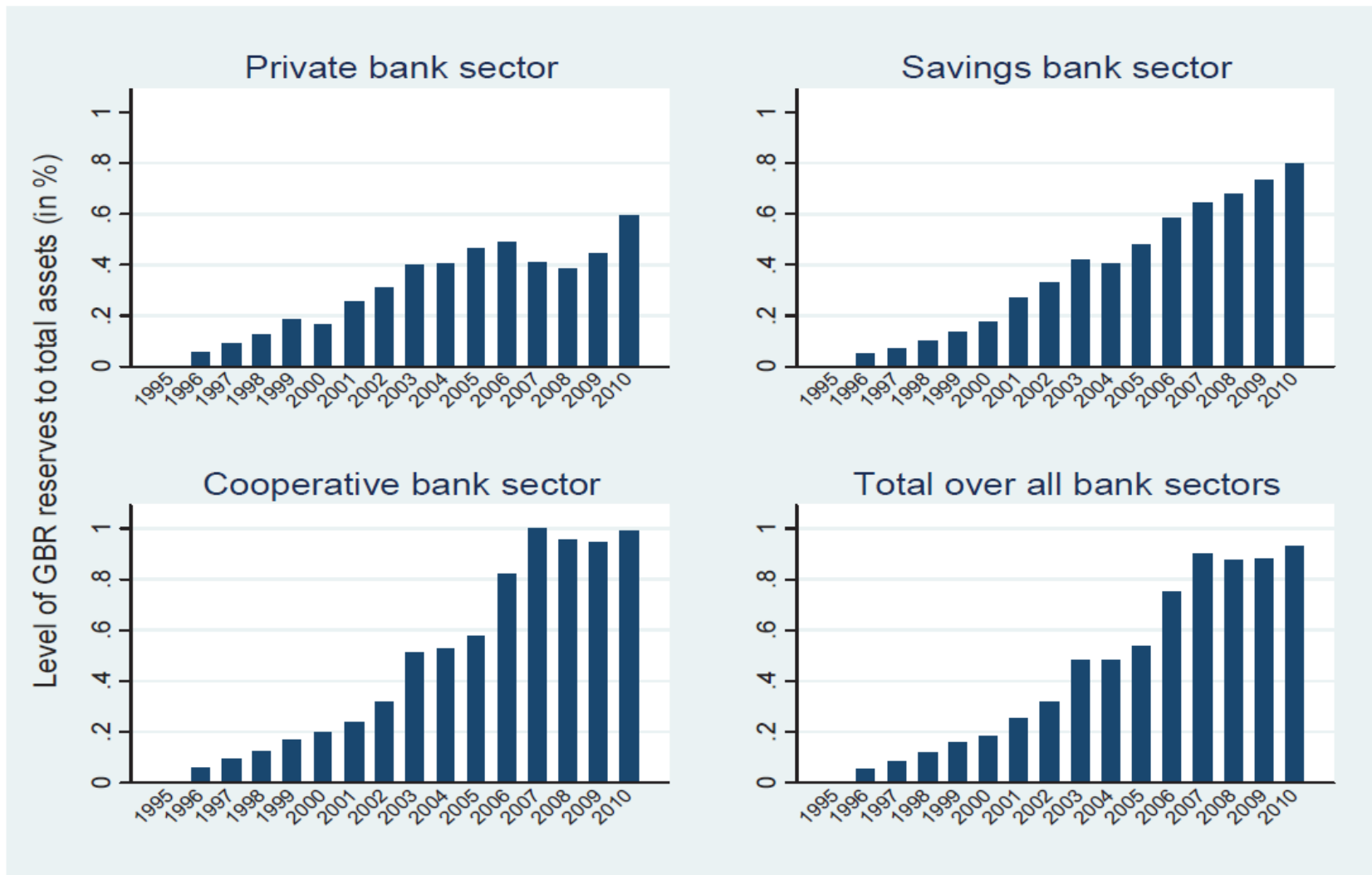
Visible Reserves in Banks – Determinants of Initial Creation, Usage, and Contribution to Bank Stability – Initial Creation of GBR reserves

Model Description

- Employ a **Cox – proportional hazard model**

- Baseline specification:

$$h_i(t) = h_0(t) \cdot \exp(\beta_1 \cdot LOANS_{i,t}^{TA} + \beta_2 AAR_{i,t}^{TA} + \beta_3 \cdot NPL_{i,t}^{TA} + \beta_4 LCO_{i,t}^{TA} + \beta_5 INR_{i,t}$$

$$+ \beta_6 ZSCORE_{i,t} + \beta_7 TIER1_{i,t}^{RWA} + \beta_8 TAGR_{i,t} + \beta_9 340 f_{i,t}^{TA} + \beta_{10} LNTA_{i,t}$$

$$+ \beta_{11} GDPGR_{i,t} + \beta_{12} D\_SAVINGS + \beta_{13} DCOOPS + \sum_{j=0}^{14} [\beta_{(14+j)} \cdot D\_(1996+j)_t]$$

- Alternative specification: **logit model** with dependent variable **D_GBR = 1** if banks show a **positive level of GBR reserves**

Hypotheses (I)

- **Hypothesis 1:** A bank's risk level is **positively related** to the creation and use of **GBR reserves**

  → *banks use GBR reserves for **risk provisioning***

- **Hypothesis 2**: A bank's **level of regulatory capital**, net of GBR reserves, is **negatively related** to the creation and use of GBR reserves

  → *banks use GBR reserves to comply with **regulatory capital management***

Visible Reserves in Banks – Determinants of Initial Creation, Usage, and Contribution to Bank Stability
– Initial Creation of GBR reserves

	Private bank sector		Savings bank sector		Cooperative bank sector	
	COX_i	$D\_GBR_{i,t+1}$	COX_i	$D\_GBR_{i,t+1}$	COX_i	$D\_GBR_{i,t+1}$
$LOANS_{i,t}^{TA}$	-0.0044	-0.0041	-0.0006	0.0160*	-0.0213***	-0.0164***
$AAR_{i,t}$	-0.0134	-0.0019	-0.0328***	-0.0600***	0.0143**	0.0070
$NPL_{i,t}^{TA}$	0.0215	-0.0725*	-0.0076	-0.0770	0.0055	-0.0144
$LCO_{i,t}^{TA}$	0.0540	-0.2480	-1.1998***	-1.1268***	0.3077**	0.0902
$INR_{i,t}$	0.7052	-0.3288	-0.1868	-0.8074	0.2711	0.2711
$ZSCORE_{i,t}$	0.2122	0.1182	0.1329	0.4066*	0.6210***	0.5750***
$TIER1_{i,t}^{RWA}$	-0.0829*	-0.0662**	-0.2267***	-0.2527***	-0.0304	-0.0763***
$TAGR_{i,t}$	0.0297**	0.0173**	0.0085	0.0233**	0.0043	0.0239***
$340f_{i,t}^{TA}$	0.2241	0.3498	0.5023***	0.5445***	0.5502***	0.5272***
$LNTA_{i,t}$	0.6337***	0.7231***	0.4632***	0.4483***	0.5484***	0.2220***
$GDPGR_{i,t}$	0.0707	-0.0354	0.0571	0.0807**	-0.0693	-0.0271
Observations	1,852	2,110	6,911	7,974	20,765	23,623
Number of Banks	282	295	744	785	3,388	3,534
McFadden's Adj. R^2	0.248	0.298	0.087	0.339	0.072	0.379
AUC value		0.866		0.880		0.898
Year Dummies	YES	YES	YES	YES	YES	YES

Visible Reserves in Banks – Determinants of Initial Creation, Usage, and Contribution to Bank Stability
– Initial Creation of GBR reserves

Results

- **Private Banks & Savings Banks**
  - **No evidence** for **risk provisioning**, no positive and significant coefficients on the variables proxying for risk taking
  - Evidence for **regulatory capital management**, significant coefficients for **TIER1** and **TAGR**
- **Cooperative Banks**
  - **Banks create GBR reserves** (at least partly) **for risk provisioning,** positive coefficients on **AAR** and **LCO**
  - **Logit specification** supports **regulatory capital hypothesis**
  - Evidence that cooperative banks create GBR reserves for **both risk provisioning and capital management purposes**

Visible Reserves in Banks – Determinants of Initial Creation, Usage, and Contribution to Bank Stability
– Usage of GBR reserves

Model Description

- As **level of GBR reserves** is truncated at 0 and positive, we employ a **tobit model**

- Extend the set of **independent variables** for **return on assets (ROA)** and the **change in loan deposits (CHLTD)**

- **Dependent variable** is the level $GBR_{i,t+1}^{TA} = \begin{cases} Y_{i,t+1} & if\ Y_{i,t+1} > 0 \\ 0 & if\ Y_{i,t+1} \leq 0 \end{cases}$

- **Alternative specification** with the **change in GBR reserves** (scaled by end-of-year total assets)

- Take into account the **number of observations not using GBR reserves**, i.e., $GBR_{i,t+1}^{TA} = 0$

Visible Reserves in Banks – Determinants of Initial Creation, Usage, and Contribution to Bank Stability – Usage of GBR reserves

Hypotheses (II)

- **Hypothesis 3**: A **bank's return on assets**, net of GBR reserves, is **positively related** to the creation and use of GBR reserves

  → banks use GBR reserves for **earnings management** (e.g., **income smoothing)**

- **Hypothesis 4**: A change in **banks' loans-to-deposits ratio** is **positively related** to the creation and use of GBR reserves

  → banks use GBR reserves for **internal funding**

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	Private bank sector		Savings bank sector		Cooperative bank sector	
	$GBR_{i,t+1}^{TA}$	$CHGBR_{i,t+1}^{TA}$	$GBR_{i,t+1}^{TA}$	$CHGBR_{i,t+1}^{TA}$	$GBR_{i,t+1}^{TA}$	$CHGBR_{i,t+1}^{TA}$
$LOANS_{i,t}^{TA}$	0.0038	-0.0001	0.0102**	0.0043**	-0.0077**	-0.0039***
$AAR_{i,t}$	-0.0058	-0.0068*	-0.0310***	-0.0114***	0.0026	0.0015
$NPL_{i,t}^{TA}$	-0.0294	-0.0052	0.0000	-0.0059	-0.0059	-0.0051
$LCO_{i,t}^{TA}$	0.0331	-0.0660	-0.4909***	-0.2062***	0.0929	0.0251
$INR_{i,t}$	0.3388	0.3918	-0.5239*	-0.1290	0.0935	0.1431
$ZSCORE_{i,t}$	0.0775	0.0837	0.1763	0.0300	0.3745***	0.0932***
$TIER1_{i,t}^{RWA}$	-0.0274**	-0.0240**	-0.1096***	-0.0349***	-0.0458***	-0.0135**
$TAGR_{i,t}$	0.0081**	0.0042	0.0152***	0.0079***	0.0074*	0.0066***
$ROA_{i,t+1}$	**-0.0055**	**0.0447**	**0.3335*****	**0.1847*****	**0.2231*****	**0.1935*****
$CHLTD_{i,t+1}$	**0.0075***	**0.0145*****	**0.0111*****	**0.0076*****	**-0.0000**	**0.0010**
$340f_{i,t}^{TA}$	0.3080*	0.2466**	0.2622***	0.1339***	0.3231***	0.1832***
$LNTA_{i,t}$	0.2736***	0.1252***	0.1404***	0.0620***	0.1019***	0.0708***
$GDPGR_{i,t}$	-0.0045	-0.0636	0.0347**	0.0079	-0.0165	-0.0291***
Observations	1,953	1,953	7,774	7,774	22,174	22,174
Number of Banks	277	277	769	769	3,434	3,434
McFadden's Adj. R^2	0.213	0.204	0.289	0.376	0,300	0,317
Year Dummies	YES	YES	YES	YES	YES	YES

Results

- **Private Banks**
  - No evidence for **earnings management**
  - <u>BUT:</u> GBR reserves seem to be used as an **internal funding device**

- **Savings Banks**
  - Strong support for H 3 and H 4: **GBR reserves appear to be used for both earnings management and internal funding purposes**

- **Cooperative Banks**
  - Only the **"earnings management hypothesis" is supported** by the regression results

Model Description

- Bank **rating model** is based on **CAMEL taxonomy** (Capital Adequacy, Asset Quality, Management, Earnings, Liquidity)

- Instead of proxying bank risk only with balance sheet data (e.g., the **z-score**) we utilize **bank distress and bank default events**

- Two definitions
  - Broad definition: **bank distress** covers **not only default**, also capital support measures by banking associations
  - Narrow definition: **bank default** only takes **bank merges** into account

- The **z-score** is only used in robustness regressions

Hypothesis (III)

- Hypothesis 5: A **bank's use of GBR reserves** is **negatively related** to the probability of **experiencing future bank distress and default events**

  → *GBR reserves increase bank stability*

Visible Reserves in Banks – Determinants of Initial Creation, Usage, and Contribution to Bank Stability
– Contribution to bank stability

	$D\_DISTRESS_{i,t+1}$		$D\_DEFAULT_{i,t+1}$		$ZSCORE_{i,t+1}$	
D_GBR	-0.4671**		-1.2739**		0.1210***	
$GBR_{i,t}^{TA}$		0.2682		-3.6634**		0.1039***
$LOANS_{i,t}^{TA}$	-0.0052	-0.0056	0.0044	0.0042	0.0066***	0.0066***
$AAR_{i,t}$	-0.0144**	-0.0133**	-0.0039	-0.0036	0.0078***	0.0078***
$NPL_{i,t}^{TA}$	0.2464***	0.2478***	0.1251***	0.1264***	-0.0515***	-0.0521***
$D\_LIAB_{i,t}$	0.7636***	0.7533***	0.6343***	0.6354***	-0.0939***	-0.0919***
$D\_REDUCTION_{i,t}$	0.2885**	0.2729**	0.9595***	0.9600***	-0.1571***	-0.1576***
$INR_{i,t}$	-0.6606	-0.7366	-0.0839	-0.0892	-0.0838	-0.0798
$HHI\_SEC_{i,t}$	0.0006	0.0004	0.0096	0.0093	-0.0054***	-0.0054***
$TIER1_{i,t}^{RWA}$	-0.0341	-0.0302	-0.0731**	-0.0725**	0.0504***	0.0500***
$ROA_{i,t+1}$	-0.9905***	-0.9983***	-0.6554***	-0.6535***	0.1082***	0.1063***
$TAGR_{i,t}$	-0.0185**	-0.0192**	-0.0172	-0.0175	-0.0043***	-0.0042***
$340f_{i,t}^{TA}$	-1.4870***	-1.5092***	-1.7437***	-1.7360***	-0.0007	-0.0022
$LNTA_{i,t}$	0.3328***	0.3099***	-0.3055***	-0.3109***	0.0543***	0.0571***
$GDPGR_{i,t}$	0.0200	0.0214	0.0100	0.0101	-0.0079**	-0.0080**
D_SAVINGS	-0.0920	-0.0784	0.9748**	0.9796**	0.5229***	0.5202***
D_COOPS	1.0681***	1.0727***	0.8980***	0.8948***	0.7255***	0.7245***
Observations	32,019	32,019	32,019	32,019	32,019	32,019
Number of Banks	4,487	4,487	4,487	4,487	4,487	4,487
McFadden's Adj. R^2	0.367	0.366	0.277	0.277	0.264	0.264
AUC value	0.911	0.911	0.904	0.904		
Year Dummies	YES	YES	YES	YES	YES	YES

Visible Reserves in Banks – Determinants of Initial Creation, Usage, and Contribution to Bank Stability
– GBR reserves and bank stability

Results

- Banks which hold GBR reserves face a **lower probability of experiencing bank distress and bank default events**

- Banks use GBR reserves to take **precautions** beyond the "legally required" **risk provisioning** to increase their stability

- Positive effect of GBR reserves on bank stability **can be shown for different measures of bank distress and bank default**:
  - *Capital support measures* provided by the banking associations (broad definition)
  - *Distresses mergers and bank moratoria* (narrow definition)
  - *Z-score*

Visible Reserves in Banks – Determinants of Initial Creation, Usage, and Contribution to Bank Stability – Robustness Checks

Robustness Checks

- **Use a variety of model specifications**
  - Cox – proportional hazard models
  - Tobit models / logit models
  - OLS models
- **Exclude the crisis years**
- **Use several measures of bank distress and bank default**
- **Use of GBR reserves is measured by both**
  - a dummy variable, and
  - the "amount" of GBR reserves (i.e., GBR reserves over total assets)

Findings are robust to several model specifications

Conclusions and key messages

- **Main messages regarding the creation and usage of GBR reserves**
  - Risk provisioning can be seen as a <u>minor motive</u>
  - GBR reserves are primarily created and used to <u>build up Tier 1 capital</u> for regulatory capital management
  - For cooperative and savings banks, the usage of GBR reserves is also driven by <u>earnings management motives</u>

- **Key message regarding bank stability**
  - Banks using GBR reserves face a <u>lower risk</u> of future bank distress and bank default events