Financial System

Financial Regulation: bank capital

Luigi Vena

14 November 2018

Introduction

- In a nutshell, the banking activity consists of borrowing money from savers and lending money to spenders, in order to take profit from the higher interest rates applied on investments. Such an activity makes them exposed to several risks
- Banks cover part of these risks (expected loss) through reserves and capital provisions
- Also, financial derivatives and other financial instruments can be used to hedge from other risks
- Governmental safety net can be used to prevent bank runs and liquidity crises (in Italy, the "Fondo Interbancario di Tutela dei Depositi" covers bank deposits below €103,000)
- However, if on the one hand these mechanisms compensate the risks borne by banks, on the other hand they incentivize the moral hazard by bankers
- Thus, in addition to them banks must respect several capital requirements

The importance of capital

- Banks are highly leveraged institutions
  - Most of their activities is financed with debt (e.g., bonds, bank accounts, deposits…)
- Capital serves several functions in banks, such as:
  - Cushion against banks’ business losses
  - Promotes public confidence
  - Enhances organizations’ growth
  - Sets limit to risk exposure
  - Provides a measure of soundness and stability

Focus: bail-in v/s bailout

Bail-in and bailout are two “mechanisms” that involve financial institutions when they are on the brink of failure

Bail-in: investors and depositors of a bank take a loss on their holdings

Bailout: government offers money to a failing financial institution to prevent the economic consequences of its downfall (“too big to fail” “too entangled to fail”)

- Bailout has typically the form of loans, bonds, stocks or cash
- Banks cover their losses with taxpayers money

Capital adequacy rules

Aim: ensure that the institution has enough capital in relation to the risks with their entity's activities

- What does "enough capital" mean?
  - Necessary to cover any unforeseen/unexpected loss
- How is capital adequacy defined?
  - It is defined as a capital level/threshold that is deemed (by regulators) sufficient to provide a safety net against bank losses (i.e. capital should be necessary to protect banks from losses)
- The Basel Committee on Banking Supervision has provided a capital regulation framework which is known as the Basel Accord

Basel IV Accord: how we got there

- 1988 – Basel Accord
  - Banks are required to hold capital equal to 8% of the risk-weighted assets (RWAs)
- 1999 – Basel II Accord
  - Still bank capital should equal at least 8% of the RWAs
  - Capital allocation is more risk-sensitive
  - Enhance disclosure requirements
- 2013-2019 – Basel III Accord
  - Strengthen the Basel II requirements
  - Introduction of requirements to mitigate the risk of bank run
- 2016-2017 – Basel IV Accord
  - Aims at strengthening the Basel III accord, by limiting banks' discretion

Basic structure of the Basel Accord

- The guideline is structured around the following three aspects
  - **First pillar:** minimum capital requirements to be maintained by a bank against credit, market and operational risk
  - **Second pillar:** assessing overall capital adequacy in relation to bank's risk profile and a strategy for maintaining capital at an adequate level
  - **Third pillar:** disclosure of information on banks' risk profile, capital adequacy, and risk management

Basel III Accord: an overview

Basel III Accord

Minimum capital requirements

Credit, Market, Operational Risks

- CET1 & AT1 capital
- Tier 2 capital
- Total capital
- Conservation buffer
- Countercyclical Buffer

Increase in **quantity** and **quality** of capital

Risk coverage

Leverage ratio

Supervisory Review

Capital Adequacy Assessment Process (ICAAP)

Supervisory Review and Evaluation Process (SREP)

Market Discipline

Disclosure requirements

Liquidity requirements

Liquidity Coverage Ratio (LCR)
To face the net liquidity outflows in a 30-day period

Net Stable Funding Ratio (NFSR)
To ensure a sound funding structure over a 1-year period

Pillar 3 report: an example

Content

Risk Weighted Assets

- Capital requirements are related to a measure of exposures that considers their riskiness, the Risk Weighted Assets (RWA/RWAs), which can be computed according to two approaches
- **Standardized approach**: financial institutions with scarcely developed risk management functions must refer the risk rating of external agencies to which a risk weight is linked by the regulator
- **Internal ratings-based (IRB) approach**:
  - Baseline: financial institutions are allowed to estimate the PD, using the LGD and EAD provided by the regulator
  - Advanced: the financial institutions estimate, through models validated by regulators, the PD, LGD, EAD of each exposure thus determining its weight

RWAs: an example

EU OV1 – Overview of RWA

		in € m.	Sep 30, 2018 a1 RWA	Sep 30, 2018 b1 Minimum capital requirements	Jun 30, 2018 a2 RWA	Jun 30, 2018 b2 Minimum capital requirements
	1	Credit risk (excluding CCR)	163,444	13,076	166,706	13,336
		of which:				
Art 438(c)(d)	2	The standardized approach	18,828	1,506	19,118	1,529
Art 438(c)(d)	3	The foundation IRB (FIRB) approach	3,638	291	3,491	279
Art 438(c)(d)	4	The advanced IRB (AIRB) approach	134,371	10,750	137,650	11,012
Art 438(d)	5	Equity IRB under the simple risk-weighted approach or the IMA	6,606	529	6,447	516
Art 107 Art 438(c)(d)	6	Counterparty credit risk (CCR)	36,117	2,889	37,717	3,017
		of which:				
Art 438(c)(d)	7	Mark to market	5,375	430	4,522	362
Art 438(c)(d)	8	Original exposure	0	0	0	0
	9	The standardized approach	0	0	0	0
	9a	Financial collateral comprehensive method (for SFTs)	2,226	178	2,270	182
	10	Internal model method (IMM)	18,714	1,497	21,524	1,722
Art 438(c)(d)	11	Risk exposure amount for contributions to the default fund of a CCP	615	49	516	41
Art 438(c)(d)	12	Credit Valuation Adjustment (CVA)	9,187	735	8,885	711
Art 438(e)	13	Settlement risk	53	4	358	29
Art 449(o)(i)	14	Securitization exposures in the banking book (after the cap)	8,369	669	7,541	603
		of which:				
	15	IRB approach	7,530	602	6,718	537
		of which:				
	16	IRB supervisory formula approach (SFA)	5,543	443	4,828	386
	17	Internal assessment approach (IAA)	0	0	0	0
	18	Standardized approach	838	67	824	66
	19	Market risk	30,219	2,418	30,437	2,435
		of which:				
	20	Standardized approach	4,824	386	4,516	361
	21	IMA	25,395	2,032	25,921	2,074
Art 438(e)	22	Large exposures	0	0	0	0
Art 438(f)	23	Operational risk	90,846	7,268	93,489	7,479
		of which:				
	24	Basic indicator approach	0	0	0	0
	25	Standardized approach	0	0	0	0
	26	Advanced measurement approach	90,846	7,268	93,489	7,479
Art 437(2), 48,60	27	Amounts below the thresholds for deduction (subject to 250 % risk weight)	12,677	1,014	12,070	966
Art 500	28	Floor adjustment	0	0	0	0
	29	Total	**341,725**	**27,338**	348,319	27,866

Focus on ratings

S&P	Fitch	Moody's	Category	PD
AAA	AAA	Aaa	Minimum	0,01%
AA+, AA, AA-	AA+, AA, AA-	Aa1, Aa2, Aa3	Modest	0,02-0,04%
A+, A, A-	A+, A, A-	A1, A2, A3	Low	0,05-0,09%
BBB+, BBB, BBB-	BBB+, BBB, BBB-	Baa1, Baa2, Baa3	Acceptable	0,13-0,32%
BB+, BB, BB-	BB+, BB, BB-	Ba1, Ba2, Ba3	Acceptable	0,53-1,57%
B+, B, B-	B+, B, B-	B1, B2, B3	To be monitored	2,64-7,52%
CCC+, CCC, CCC-	CCC	Caa1, Caa2, Caa3	Possible default	13-20%
CC, C		Ca	Close to default	26-30%
D	**DDD, DD, D**	**C**	**Default**	

Standardized approach: risk weights by rating class

Claims on…	**Rating class**						
	AAA/AA-	*A+/A-*	*BBB+/BBB-*	*BB+/BB-*	*B+/B-*	*Below B-*	*Unrated*
Banks and other FIs	20%	50%	100%	100%	100%	150%	100%
Sovereigns	0%	20%	50%	100%	100%	150%	100%
Corporates	20%	50%	100%	100%	150%	150%	100%
Retail products	75%						
Claims secured by residential properties	30%						
Cash	0%						

Minimum capital requirement: an example

- Suppose a €1,000,000 investment in a corporate bond with A- rating
- Compute the minimum capital requirement* in light of the Basel III accord
- Suppose that, due to a deterioration of the credit worthiness, S&P reduces the rating on bond from A- to BBB+
- Does the bank capital change because of this downgrade?

Claims on…	**Rating class**					
	AAA/AA-	*A+/A-*	*BBB+/BBB-*	*BB+/BB-*	*B+/B-*	*Below B-*	*Unrated*
Corporates	20%	50%	100%	100%	150%	150%	100%

*Minimum capital requirement = 8% * RWAs

Capital Base

- Tier 1 capital (going-concern capital)
  - Common Equity Tier 1 → in case of default, CET1 holders have the lowest claim on bank's assets
    - Common shares
    - Stock surplus
    - Retained earnings
    - Reserves
  - Additional Tier 1 → in case of default, AT1 holders are paid once subordinated bond holders are paid in full
    - Instruments that meet several criteria (no maturity, callable, discretionary dividend…)
- Tier 2 capital (gone-concern capital) → creditors won't be paid until after senior debt holders are paid in full
  - Subordinated debt instruments (maturity>5Y, no step-ups, callable when (1) replaced with higher quality capitals or (2) the capital position is well above the minimum

Capital, risk coverage and leverage

- Minimum capital requirements are expressed as ratios

$$CET1\ capital\ ratio = \frac{CET_1}{RWA} \geq 4.5\%$$

$$Tier\ 1\ capital\ ratio = \frac{Tier\ 1\ capital}{RWA} \geq 6\%$$

$$Total\ capital\ ratio = \frac{Total\ capital}{RWA} \geq 8\%$$

$$Leverage\ ratio = \frac{Tier\ 1\ capital}{Total\ exposures} \geq 3\%$$

- Total exposures: sum of all the bank exposures including off-balance sheet items

Regulatory capital and ratios: an example

Transitional template for regulatory capital, RWA and capital ratios

in € m.	Dec 31, 2017 CRR/CRD 4 fully loaded	Dec 31, 2017 CRR/CRD 4	Dec 31, 2016 CRR/CRD 4 fully loaded	Dec 31, 2016 CRR/CRD 4
Common Equity Tier 1 (CET 1) capital: instruments and reserves				
Capital instruments and the related share premium accounts	45,195	45,195	37,290	37,290
Retained earnings	17,977	17,977	20,113	20,113
Accumulated other comprehensive income (loss), net of tax	696	660	3,708	3,645
Independently reviewed interim profits net of any foreseeable charge or dividend[1]	(751)	(751)	(2,023)	(2,023)
Other	0	33	0	79
Common Equity Tier 1 (CET 1) capital before regulatory adjustments	**63,116**	**63,114**	**59,088**	**59,104**
Common Equity Tier 1 (CET 1) capital: regulatory adjustments				
Additional value adjustments (negative amount)	(1,204)	(1,204)	(1,398)	(1,398)
Other prudential filters (other than additional value adjustments)	(102)	(74)	(639)	(428)
Goodwill and other intangible assets (net of related tax liabilities) (negative amount)	(8,394)	(6,715)	(8,436)	(5,062)
Deferred tax assets that rely on future profitability excluding those arising from temporary differences (net of related tax liabilities where the conditions in Art. 38 (3) CRR are met) (negative amount)	(3,004)	(2,403)	(3,854)	(2,312)
Negative amounts resulting from the calculation of expected loss amounts	(502)	(408)	(297)	(188)
Defined benefit pension fund assets (negative amount)	(1,125)	(900)	(945)	(567)
Direct, indirect and synthetic holdings by an institution of own CET 1 instruments (negative amount)	(144)	(117)	(59)	(41)
Direct, indirect and synthetic holdings by the institution of the CET 1 instruments of financial sector entities where the institution has a significant investment in those entities (amount above the 10 % / 15 % thresholds and net of eligible short positions) (negative amount)	0	0	0	0
Deferred tax assets arising from temporary differences (net of related tax liabilities where the conditions in Art. 38 (3) CRR are met) (amount above the 10 % / 15 % thresholds) (negative amount)	0	0	(590)	(354)
Other regulatory adjustments[2]	(341)	(485)	(591)	(971)
Total regulatory adjustments to Common Equity Tier 1 (CET 1) capital	**(14,816)**	**(12,306)**	**(16,810)**	**(11,321)**
Common Equity Tier 1 (CET 1) capital	**48,300**	**50,808**	**42,279**	**47,782**
Additional Tier 1 (AT1) capital: instruments				
Capital instruments and the related share premium accounts	4,676	4,676	4,676	4,676
Amount of qualifying items referred to in Art. 484 (4) CRR and the related share premium accounts subject to phase out from AT1	N/M	3,904	N/M	6,516
Additional Tier 1 (AT1) capital before regulatory adjustments	**4,676**	**8,579**	**4,676**	**11,191**
Additional Tier 1 (AT1) capital: regulatory adjustments				
Direct, indirect and synthetic holdings by an institution of own AT1 instruments (negative amount)	(55)	(26)	(125)	(51)
Residual amounts deducted from AT1 capital with regard to deduction from CET 1 capital during the transitional period pursuant to Art. 472 CRR	N/M	(1,730)	N/M	(3,437)
Other regulatory adjustments	0	0	0	0
Total regulatory adjustments to Additional Tier 1 (AT1) capital	**(55)**	**(1,756)**	**(125)**	**(3,488)**
Additional Tier 1 (AT1) capital	**4,621**	**6,823**	**4,551**	**7,703**
Tier 1 capital (T1 = CET 1 + AT1)	**52,921**	**57,631**	**46,829**	**55,486**
Tier 2 (T2) capital	**10,329**	**6,384**	**12,673**	**6,672**
Total capital (TC = T1 + T2)	**63,250**	**64,016**	**59,502**	**62,158**
Total risk-weighted assets	**344,212**	**343,316**	**357,518**	**356,235**
Capital ratios				
Common Equity Tier 1 capital ratio (as a percentage of risk-weighted assets)	14.0	14.8	11.8	13.4
Tier 1 capital ratio (as a percentage of risk-weighted assets)	15.4	16.8	13.1	15.6
Total capital ratio (as a percentage of risk-weighted assets)	18.4	18.6	16.6	17.4

N/M – Not meaningful

From Basel II to Basel III

Basel Committee on Banking Supervision

BANK FOR INTERNATIONAL SETTLEMENTS

Basel III phase-in arrangements

(All dates are as of 1 January)

	Phases	2013	2014	2015	2016	2017	2018	2019
Capital	Leverage Ratio	Parallel run 1 Jan 2013 – 1 Jan 2017 Disclosure starts 1 Jan 2015					Migration to Pillar 1	
Capital	**Minimum Common Equity Capital Ratio**	3.5%	4.0%	4.5%				**4.5%**
Capital	Capital Conservation Buffer				0.625%	1.25%	1.875%	**2.5%**
Capital	**Minimum common equity plus capital conservation buffer**	3.5%	4.0%	4.5%	5.125%	5.75%	6.375%	**7.0%**
Capital	Phase-in of deductions from CET1*		20%	40%	60%	80%	100%	**100%**
Capital	**Minimum Tier 1 Capital**	4.5%	5.5%	6.0%				**6.0%**
Capital	Minimum Total Capital	8.0%						**8.0%**
Capital	**Minimum Total Capital plus conservation buffer**	8.0%			8.625%	9.25%	9.875%	**10.5%**
Capital	Capital instruments that no longer qualify as non-core Tier 1 capital or Tier 2 capital	Phased out over 10 year horizon beginning 2013						
Liquidity	**Liquidity coverage ratio – minimum requirement**			60%	70%	80%	90%	**100%**
Liquidity	Net stable funding ratio						Introduce minimum standard	

* Including amounts exceeding the limit for deferred tax assets (DTAs), mortgage servicing rights (MSRs) and financials.

– – transition periods