BANKING

Lecture 10 – IFRS 9 ECL Provisioning

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Key terms from Lecture 9/Central banking

- Theoretical vs empirical definition of money

- Macro- and microeconomic functions of a central bank

- Conventional instruments, nonconventional instruments: open liquidity facilities/liquidity support, credit facilities, quantitative easing, forward guidance, FX interventions)

- Classic repo vs reverse repo

- Inflation targeting: the CNB (2%+-1%), the ECB (<2%)

- Monetary aggregates: low M0/M2 ratio (10-12%)

- Interest rates, Fisher equation, yield curve (theories)

- Impact of the LIRE: general terms (short-run effects and longer-term problems), bank profitability (positive short-term vs negative long-term effects), non-linear relationship between ROA of banks and the slope of the yield curve

- **Reading 3** - Time inconsistency in recent monetary policy

International Financial Reporting Standards (IFRS)

- common accounting rules for financial statements to foster consistency, transparency, and comparability around the world

- issued by the International Accounting Standards Board (IASB) since 2001

- aim to have entities report their financial position in a true and fair fashion, mostly using "fair value" (market value, net present value)

- replaced older standards called International Accounting Standards (IAS) issued by IASB predecessor International Accounting Standards Committee (IASC) during 1973-2000

- used in more than 120 countries (all EU, Asia, Africa, Latin America) except the US, which uses Generally Accepted Accounting Principles (GAAP)
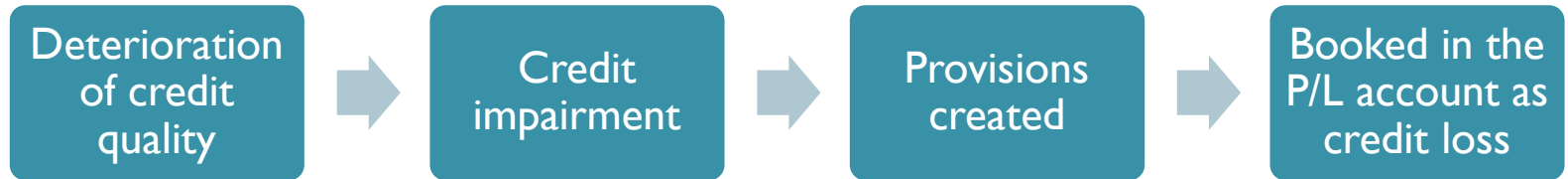
Provisioning practices before IFRS 9 (pre-2018)

IFRS 9 Expected Credit Loss (ECL) Concept

Estimating and Projecting IFRS 9 Provisions

What are provisions?

Deterioration of credit quality	→	Credit impairment	→	Provisions created	→	Booked in the P/L account as credit loss

- a provision is an adjustment to the value (carrying amount) of a financial asset related to credit impairment

- captures a decline in the recoverable value (fair value) of an asset (such as a loan or bond) due to deterioration in credit quality of the obligor (borrower)

- Historically, two ways of provisioning for financial assets developed:
  - accounting standards (IAS 39 during 2003-2017, IFRS 9 since 2018)
  - regulatory (prudential) provisions (local rules set by bank supervisors)

Regulatory provisions

Coefficient-based provisioning

- Typical for emerging markets, may also be allowed for accounting purposes for banks (not used in the EU anymore)

- provisioning rates by credit quality categories (days past due, weaknesses of the borrower)

- the role of collateral
  - deducting or not before provisioning?

Category	Days past due	Typical provisioning rates
Standard / A	0-30	0-1%
Watch / B	30-90	1-5%
Substandard / C	91-180	20%
Doubtful / D	181-360	50%
Loss / E	360+	100%

General provisions (a buffer to cover "potential" losses, impact P/L but included in Tier 2 capital)

Specific provisions (to cover incurred losses, impact the net value of loans and P/L)

Non-performing (defaulted) loans (NPLs, 90+ days past due)

Accounting provisions

- set by accounting standards (IAS, IFRS, GAAP, local accounting standards)
- largely based on "fair value" accounting, i.e. using
  - discounting expected cash flows
  - statistical models and internal estimates
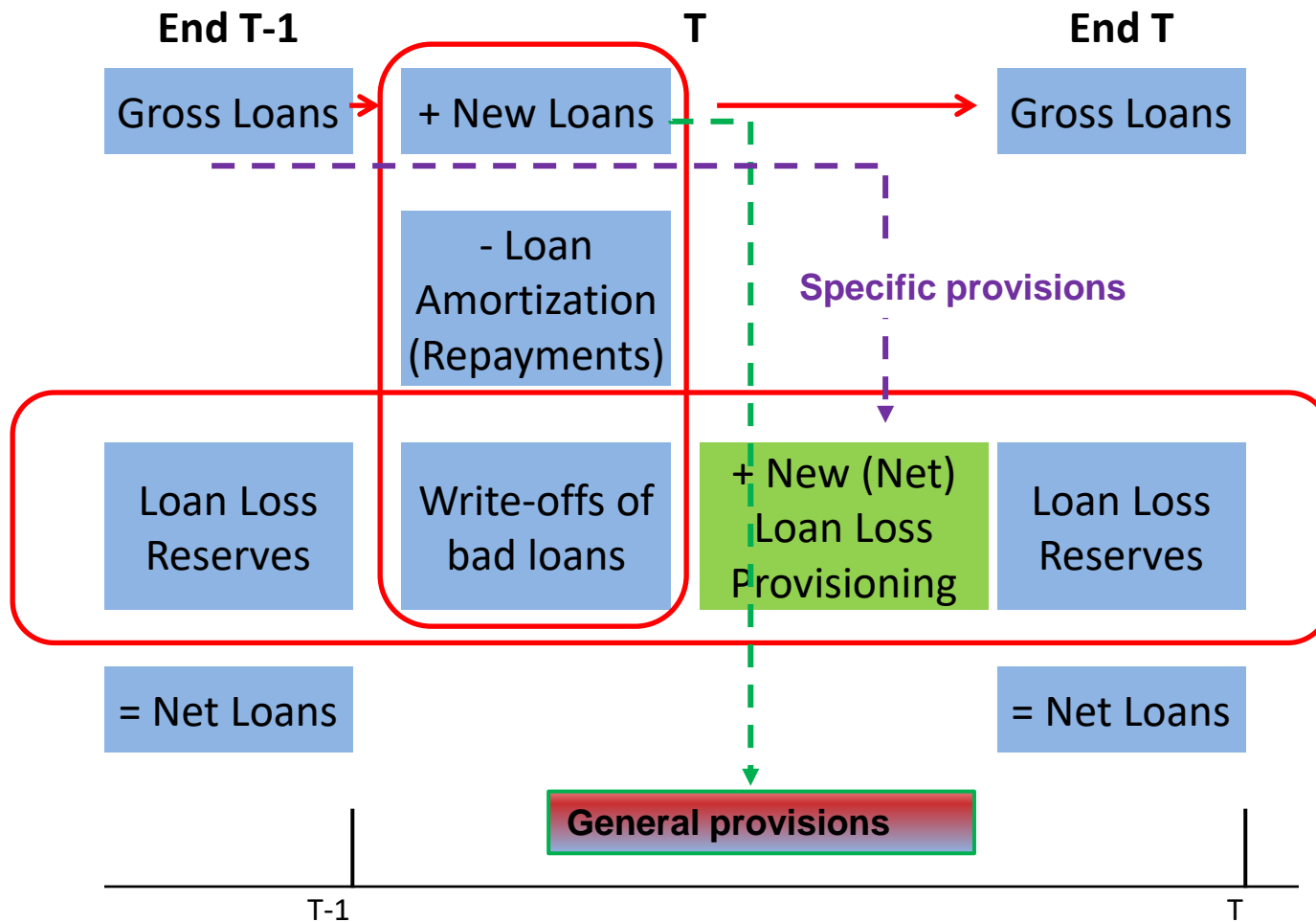- May be higher or lower than regulatory provisions

Example (discounted cash flow):

- Loan: current exposure 100, remaining maturity 1 year, interest rate 3% (PV=(100+3)/(1.03)=100 = book value!)
- Impairment: borrower not able to repay, collateral with a recovery value of 80.34 foreclosed in 1 year
- Present value after impairment: PV=80.34/1.03=78
- Impairment = provisions = 22

Provisions versus capital

Provisions	Capital
"A buffer" to cover expected losses	"A buffer" to cover unexpected losses
P&L concept - Net expense	Balance sheet concept – Liability (funding item)
Related balance sheet items – loan impairment (specific provisions) and reserves in Tier 2 capital (general provisions)	Related P&L concept – retained earnings, capital transactions
Mostly cover credit risk	Covers market and operational risks, too
Impacts profitability of banks	Profitability impacts ability to accumulate and raise capital
Historically based on accounting standards – but often regulator impose additional requirements	Capital adequacy mostly a regulatory issue – accounting definitions secondary

Accounting of bank loans and provisions

End T-1 **T** **End T**

Gross Loans → + New Loans → Gross Loans

- Loan Amortization (Repayments)

Specific provisions

Loan Loss Reserves | Write-offs of bad loans | + New (Net) Loan Loss Provisioning | Loan Loss Reserves

= Net Loans   = Net Loans

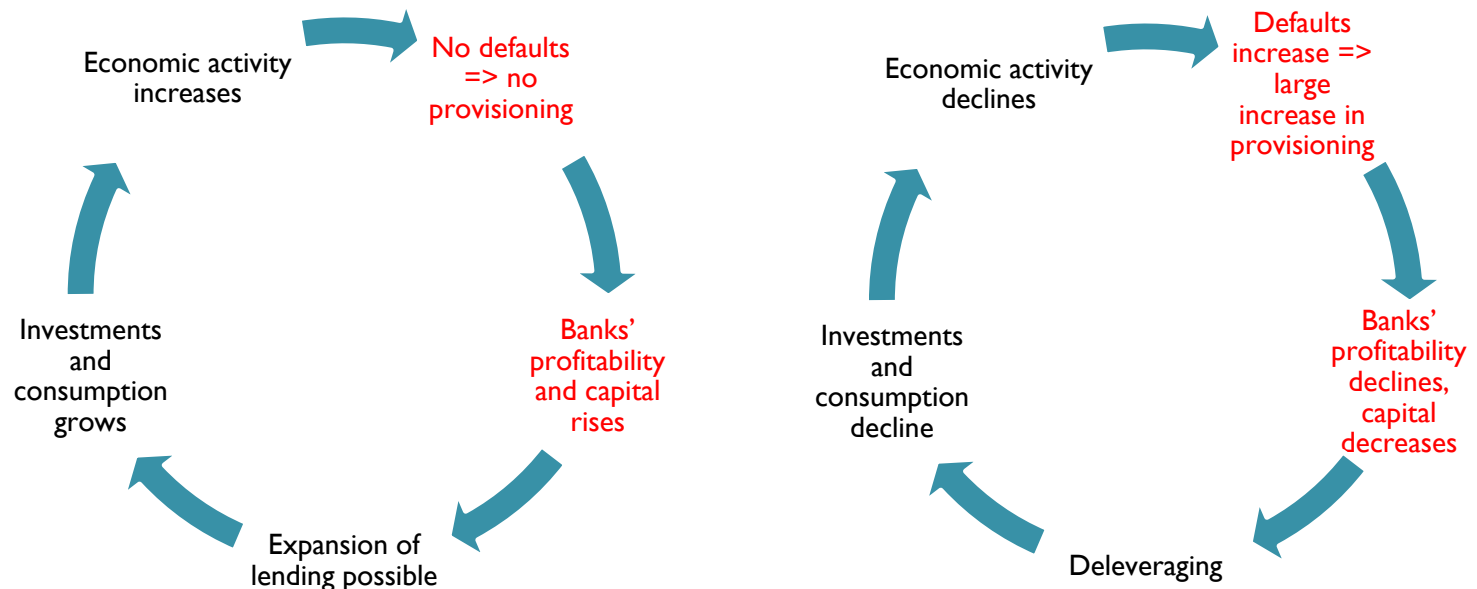General provisions

T-1   T

Balance Sheet
Profit and Loss

Slide 9

IAS 39 (2003-2017): incurred loss concept

- An evidence of impairment (a trigger or loss event) needed before provisions can be created (impairment test), such as:
  - significant financial difficulty of the issuer or obligor;
  - a breach of contract, such as a default or delinquency in interest or principal payments;
  - it is becoming probable that the borrower will enter bankruptcy or other financial reorganization
- A relatively large heterogeneity among banks/countries as to what is the trigger to create provisions (wording of IAS 39 allowed for a variety of interpretations)
- Inconsistency with Basel II (2007):
  - test of sufficiency of provisions based on "expected loss" (PDxLGD) for IRB banks, but IAS 39 did not allow such provisions
  - Led some banks to calculate IBNR provisions (Identified But Not yet Realized) – an expected loss concept, but not always approved by auditors

The main problem with IAS 39: procyclicality

- During good times, incurred-loss-based (backward-looking) provisioning supports further expansion of bank lending and the economy

- When an adverse shock hits, there is an enormous increase in provisions, leading to possible deleveraging, deepening the recession

Economic activity increases → No defaults => no provisioning → Banks' profitability and capital rises → Expansion of lending possible → Investments and consumption grows → Economic activity increases

Economic activity declines → Defaults increase => large increase in provisioning → Banks' profitability declines, capital decreases → Deleveraging → Investments and consumption decline → Economic activity declines

- Can provisioning be done in a more forward-looking way, reducing the procyclicality?

Dynamic provisioning: a forerunner of IFRS 9?

- An extension of general provisioning for good loans, i.e. a regulatory provisioning concept (but in countries where the regulator sets accounting standards for banks)

- Spain (2000-2017), copied by selected Latin American countries during 2000s (Colombia, Peru, Uruguay)

- forward-looking provisions that – before any credit loss is individually identified on a specific loan - build up a buffer of bank own funds in good times (included in Tier 2) via additional provisioning that can be used in bad times to cover the realized losses.

- Spanish formula:

These used to be the traditional general provisions

$$General\ Provisions_t = \alpha \Delta Loans_t + \left(\beta - \frac{Specific\ Provisions_t}{Loans_t} \right) Loans_t$$

This is the new "dynamic" provisions add-on

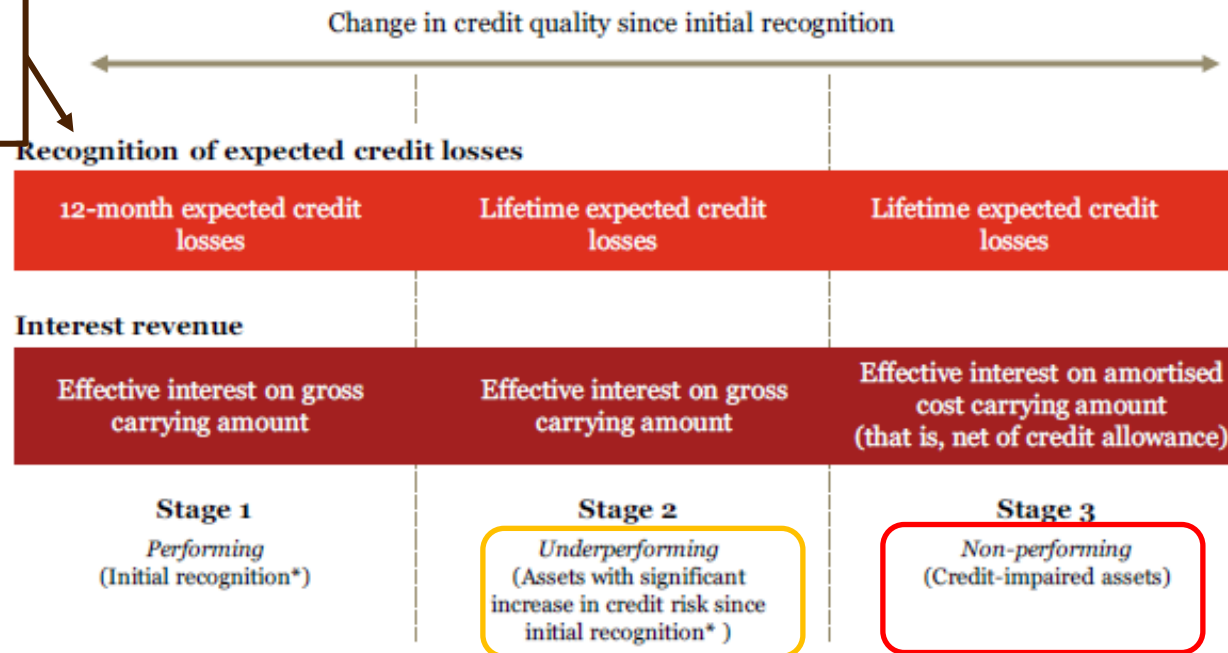Provisioning practices before IFRS 9 (pre-2018)

IFRS 9 Expected Credit Loss (ECL) Concept

Estimating and Projecting IFRS 9 Provisions

IFRS 9: expected credit loss (ECL) concept

- replaces the incurred loss model with a forward-looking ECL model
- earlier recognition of credit losses by using forward-looking information
- A three-stage model based on changes in credit quality since initial recognition:

Basically general provisions?

Change in credit quality since initial recognition

Recognition of expected credit losses

12-month expected credit losses	Lifetime expected credit losses	Lifetime expected credit losses

Interest revenue

Effective interest on gross carrying amount	Effective interest on gross carrying amount	Effective interest on amortised cost carrying amount (that is, net of credit allowance)

Stage 1	**Stage 2**	**Stage 3**
Performing (Initial recognition*)	*Underperforming* (Assets with significant increase in credit risk since initial recognition*)	*Non-performing* (Credit-impaired assets)

For example: loans past due 30+ days – basically "watch" loans?

Typically NPLs = loans past due 90+ days + other criteria of borrower's weakness

Understanding Probabilities of Default (PDs)

x = default	Year				
	1	**2**	**3**	**4**	**5**
Loan 1	x				
Loan 2					
Loan 3			x		
Loan 4	x				
Loan 5					
Loan 6		x			
Loan 7				x	
Loan 8				x	
Loan 9					
Loan 10		x			
Loan 11					
Loan 12		x			
Loan 13		x			
Loan 14					
Loan 15					
Loan 16					
Loan 17					x
Loan 18					
Loan 19					
Loan 20					
Defaults	**2**	**4**	**1**	**2**	**1**

PD for Year 1: 2/20=10%

PD for Year 2:

Option 1: 4/20 = 20% => Unconditional PD

Option 2: 4/18 = 22.22% => Conditional PD

(conditional upon survival up to Year 2)

Option 3: 6/20 = 30% => Cumulative PD

(up to Year 2)

PDs for Year 3:

Unconditional PD: 1/20 = 5%

Conditional PD: 1/14 = 7.14%

Cumulative PD: 7/20 = 35%

Definitions and formulas linking the PDs (1)

- Cumulative PD in year t indicates the probability that an obligor defaults before the end of year t.

- Unconditional PD in year t indicates the probability that an obligor defaults during year t.

$$CumPD_t = \sum_1^t UnPD_t$$

- Cumulative PD is equal to a sum of unconditional PDs!

- Check from previous example:

  ◦ UnPD for Y1: 10%

  ◦ UnPD for Y2: 20%   CumPD for Y2: 30%

  ◦ UnPD for Y3: 5%   CumPD for Y3: 35%

- If t is equal to the maturity of an exposure, cumulative PD gives a probability of default over the life of the exposure = lifetime PD

Definitions and formulas linking the PDs (2)

- Conditional PD in year t (also called Hazard Rate or Default Intensity) is the probability of default during year t conditional on survival up to (the beginning of) year t (i.e. survival of periods 1,2…t-1)

$$ConPD_t = \frac{UnPD_t}{SurvivalP_{t-1}} = \frac{UnPD_t}{1 - CumPD_{t-1}}$$

- Check from previous example:

Year	Unconditional PD (# defaults)	Cumulative PD (# defaults, cum)	Survival Probability (#survived)	Conditional PD
1	10% (2)	10% (2)	90% (18)	10%
2	20% (4)	30% (6)	70% (14)	20% / 90%= 22.22%
3	5% (1)	35% (7)	65% (13)	5% / 70% = 7.14%
4	10% (2)	45% (9)	55% (11)	10% / 65% = 15.38%
5	5% (1)	50% (10)	50% (10)	5% / 55% = 9.09%

Stage 1 exposures

- Provisioning (ECL) = 12-month expected credit loss

$$ECL = 12\text{-month PD} \times LGD \times EAD$$

- PD: point-in-time probability of default over the next 12 months
- LGD: loss given default
- EAD: exposure at default

- Typically, banks use monthly PDs, in which case the (somewhat more general and precise) formula on the next slide is used, with calculating the ECL up to 12 month

Stage 2 exposures

- Exposures with significant increase in credit risk (SICR)
- Lifetime (rather than 12M) expected credit loss (ECL LT)

Stage 2

$$ECL_{LT} = \sum_{t=0}^{M} ECL_t$$

M: (residual) maturity

Probability of default

$$ECL_t = pd_t \cdot loss_t =$$
$$(1 - PD_{0,t})PD_{t,t+1}DF_{0,t}LGD_t \cdot EAD_t$$

Cumulative PD

pd

lgd·ead

Unconditional PD

Conditional PD (on survival until t)

DF: discount factor
LGD: loss given default
EAD: exposure at default

Stage 3 exposures

- Provisioning (ECL) = using the lifetime formula, assuming PD=1 and work-out of the exposure in time *t*

$$ECL = DF_t LGD_t EAD_t$$

- Basically, the previous incurred loss model
- If cash flows (realization of collateral, selling the loan) expected in different time periods, probability-weighted discounted LGD x EAD

For all stages:

- Parameters need to use historical, current, and forward-looking information (including macro-economic outlook)
- Final provisioning = probability-weighted expected losses across at least 3 scenarios (central, optimistic, pessimistic)

For EU: European Banking Authority (EBA) Guidelines (2017)

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(1) Stage 1 ECL: consumer loans

The average 12M PD on a (performing) portfolio of consumer loans amounting to 200 USD mil is 7%, all are in Stage 1. Defaulted loans are typically sold at 5 cents per dollar of exposure. Macroeconomic situation is expected to remain stable.

Calculate Stage 1 ECL provisions for this portfolio (just central scenario, for simplification):

PD: 7%

LGD: 100 ct – 5 ct = 95 ct/USD = 95%

EAD: 200 USD mil

ECL (%) = PD x LGD = 7% x 95% = 6.65%

ECL (USD) = 6.65% x 200 USD mil =13.3 USD mil

(2) Stage 1 ECL: car loans with difference between PD and observed default rates

Based on a scoring model used and approved by the supervisor for IRB capital requirement, the average 12M PD on a (performing) portfolio of car loans amounting to 500 USD mil is 5%, all are in Stage 1. Defaulted loans are typically worked out with recoveries about 40%.

Over the past 2 years, the observed 12M default rate on this portfolio was about 4% rather than 5%. Macroeconomic situation is expected to remain stable.

Calculate Stage 1 ECL provisions for this portfolio (just central scenario):

The 5% PD is probably a through-the-cycle PD (TTC), IFRS 9 requires a point-in-time (PIT) PD. Thus, adjustment needed from 5% to 4%.

ECL (%) = PD x LGD = 4% x 60% = 2.4%

ECL (USD) = 12 USD mil

(3) Stage 1 ECL: SME loans with worsening macro situation

The average 12M PD on a (performing) portfolio of SME loans amounting to 1 USD bil is 6%, all are in Stage 1. Loans are typically collateralized, with recoveries of about 60%.

The central banks has just published a new forecast, expecting a deterioration of the macroeconomic situation, with GDP growth declining from 4% this year to 1% next year. The risk management experts have estimated that each 1 ppt decline in GDP growth leads to an increase in SME 12M default rate by 1.5 ppt, with LGD roughly unchanged given the good collateralization.

Calculate Stage 1 ECL provisions for this portfolio (just central scenario):

Using the central macro forecast, 6% PD is expected to increase by (3 x 1.5) 4.5 ppts. The new PD is 10.5%, LGD stays at 40%.

ECL (%) = PD x LGD = 10.5% x 40% = 4.2%

ECL (USD) = 42 USD mil

(4) Stage 1 ECL: sovereign bonds

Calculate Stage 1 ECL provisions (as % of exposure) for local currency sovereign bonds with S&P rating of BB.

Sovereign Local Currency Cumulative Average Default Rates Without Rating Modifiers (1993-2019)

(%)							--Time horizon (years)--								
Rating	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
AAA	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
AA	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.65	1.25	1.92	2.64	3.42
A	0.00	0.02	0.48	1.01	1.57	2.15	2.77	3.42	4.11	5.09	5.91	6.80	7.80	8.95	10.25
BBB	0.00	0.46	0.80	1.11	1.45	1.81	2.57	3.07	3.55	3.63	3.63	3.63	3.63	3.63	3.63
BB	0.68	1.40	1.84	2.25	2.90	3.60	4.20	5.02	5.78	6.29	6.86	7.51	8.27	9.16	10.21
B	1.65	2.91	4.18	5.12	5.87	6.73	7.63	8.59	9.63	10.70	11.42	12.14	12.99	14.02	14.21
CCC/CC	11.63	15.65	18.98	22.81	30.53	39.99	44.46	47.72	47.72	47.72	47.72	47.72	47.72	47.72	47.72

Default rates conditional on survival. Implied senior debt rating through 1995; sovereign credit ratings thereafter. Horizons consist of monthly cohorts for specified periods annualized. Sources: S&P Global Ratings Research and S&P Global Market Intelligence's CreditPro®.

Using the S&P data, 1-year PD of local currency sovereign bonds with BB rating is 0.68%. The market practice is to use LGD of 40%.

ECL (%) = PD x LGD = 0.68% x 40% = 0.272%

Source: S&P 2019 Annual Sovereign Default And Rating Transition Study

(5) Stage 1 ECL: mortgages with 3 scenarios

Calculate Stage 1 ECL provisions (as % of exposure) for well-collateralized performing mortgages amounting to 20 USD billion with current average 12M PD of 2% and LGD of 20% based on the evolution of house prices and expected default rate across 3 scenarios (central, optimistic, pessimistic), with probabilities of 70%, 15% and 15%, respectively.

	Scenario		
	Pessimistic	**Central**	**Optimistic**
GDP growth	1.0%	4.0%	7.0%
House prices, growth %	-2%	2%	8%
PD	3.0%	2.0%	1.0%
LGD	25.0%	20.0%	15.0%
Probability of scenario	15%	70%	15%
ECL	0.75%	0.40%	0.15%
Prob-weighted ECL	0.1125%	0.2800%	0.0225%
Final ECL	as % of EAD	0.4150%	
	in USD mil	83.000	

(6) Stage 2 ECL: consumer loans

From the exercise (1), 20 USD mil of consumer loans with 5-year residual maturity were re-classified into Stage 2 due to a significant increase of credit risk using a rebuttable presumption of 30 days past due. The 1-year average (conditional) PD (hazard rate) on such "underperforming" loans is estimated to be 16% rather than the original 7%, but the LGD assumption continues to hold. Interest rate on these loans is 12% and the loans simple annual repayment schedule. Macroeconomic situation is expected to remain stable, suggesting that the hazard rate, the LGD and the interest rates will be stable over the next 5 years. Calculate for central scenario only.

Year	Conditional PD	Survival rate	Cumulative PD	Unconditional PD	Interest rate	Discount factor	EAD	LGD	ECL (USD mil)
1	16.0%	84.0%	16.0%	16.0%	12%	0.8929	20	95%	2.714
2	16.0%	70.6%	29.4%	13.4%	12%	0.7972	16	95%	1.629
3	16.0%	59.3%	40.7%	11.3%	12%	0.7118	12	95%	0.916
4	16.0%	49.8%	50.2%	9.5%	12%	0.6355	8	95%	0.458
5	16.0%	41.8%	58.2%	8.0%	12%	0.5674	4	95%	0.172
						Total ECL (USD mil)			5.889
						ECL as % of initial exposure			29.4%

(7) Stage 2 ECL: mortgage loans

From the example (5), a 100,000 USD mortgage was re-classified into Stage 2 due to a significant increase in credit risk given the observed deterioration of the borrower's characteristics and his move to a worse scoring class. The 1-year average (conditional) PD (hazard rate) on this "underperforming" mortgage is now estimated to be 4% rather than the original 2%.

Calculate the new ECL provisions. How much will it increase from the original Stage 1 ECL provision rate of 0.4%?

Guidance:

- The current LTV ratio is 96%.

- The LGD for the individual years should be linked to the expected evolution of house prices and the degree of implied collateralization.

- Interest rate on the loan is 4% and the loan follows an annuity repayment schedule, with remaining maturity of 15 years (out of original 20 years).

- Macroeconomic situation is expected to remain stable, suggesting that the hazard rate, the growth of house prices, and the interest rates will be stable over the loan's lifetime.

(7) Stage 2 ECL: mortgage loans, continued

- LGD is depending on the LTV, whereby
  - the property price is adjusted by general house price growth and foreclosure costs
  - loan amount is decreasing due to repayments
- as LTV is "improving" (declining), the LGD is improving (declining), reaching 0% in Year 5

Year	Conditional PD	Survival rate	Cumulative PD	Unconditional PD	Interest rate	Discount factor	EAD (USD)	Annuity	Interest payment	Principal repayment	LTV	Value of property (USD)	House price growth	Haircut on value of property to cover foreclosure costs	Value of property (USD) after haircut	LTV after haircut	LGD	ECL (USD mil)
1	4.0%	96.0%	4.0%	4.0%	4.0%	0.9615	100,000.0	8,994.1	4,000.0	4,994.1	96.0%	104,166.7	2.0%	25.0%	78,125.0	128.0%	28%	1,076.9
2	4.0%	92.2%	7.8%	3.8%	4.0%	0.9246	95,005.9	8,994.1	3,800.2	5,193.9	89.4%	106,250.0	2.0%	25.0%	79,687.5	119.2%	19%	648.4
3	4.0%	88.5%	11.5%	3.7%	4.0%	0.8890	89,812.0	8,994.1	3,592.5	5,401.6	82.9%	108,375.0	2.0%	25.0%	81,281.3	110.5%	10%	308.9
4	4.0%	84.9%	15.1%	3.5%	4.0%	0.8548	84,410.4	8,994.1	3,376.4	5,617.7	76.4%	110,542.5	2.0%	25.0%	82,906.9	101.8%	2%	46.3
5	4.0%	81.5%	18.5%	3.4%	4.0%	0.8219	78,792.7	8,994.1	3,151.7	5,842.4	69.9%	112,753.4	2.0%	25.0%	84,565.0	93.2%	0%	0.0
6	4.0%	78.3%	21.7%	3.3%	4.0%	0.7903	72,950.3	8,994.1	2,918.0	6,076.1	63.4%	115,008.4	2.0%	25.0%	86,256.3	84.6%	0%	0.0
7	4.0%	75.1%	24.9%	3.1%	4.0%	0.7599	66,874.2	8,994.1	2,675.0	6,319.1	57.0%	117,308.6	2.0%	25.0%	87,981.4	76.0%	0%	0.0
8	4.0%	72.1%	27.9%	3.0%	4.0%	0.7307	60,555.0	8,994.1	2,422.2	6,571.9	50.6%	119,654.8	2.0%	25.0%	89,741.1	67.5%	0%	0.0
9	4.0%	69.3%	30.7%	2.9%	4.0%	0.7026	53,983.1	8,994.1	2,159.3	6,834.8	44.2%	122,047.9	2.0%	25.0%	91,535.9	59.0%	0%	0.0
10	4.0%	66.5%	33.5%	2.8%	4.0%	0.6756	47,148.4	8,994.1	1,885.9	7,108.2	37.9%	124,488.8	2.0%	25.0%	93,366.6	50.5%	0%	0.0
11	4.0%	63.8%	36.2%	2.7%	4.0%	0.6496	40,040.2	8,994.1	1,601.6	7,392.5	31.5%	126,978.6	2.0%	25.0%	95,233.9	42.0%	0%	0.0
12	4.0%	61.3%	38.7%	2.6%	4.0%	0.6246	32,647.7	8,994.1	1,305.9	7,688.2	25.2%	129,518.2	2.0%	25.0%	97,138.6	33.6%	0%	0.0
13	4.0%	58.8%	41.2%	2.5%	4.0%	0.6006	24,959.5	8,994.1	998.4	7,995.7	18.9%	132,108.5	2.0%	25.0%	99,081.4	25.2%	0%	0.0
14	4.0%	56.5%	43.5%	2.4%	4.0%	0.5775	16,963.7	8,994.1	678.5	8,315.6	12.6%	134,750.7	2.0%	25.0%	101,063.0	16.8%	0%	0.0
15	4.0%	54.2%	45.8%	2.3%	4.0%	0.5553	8,648.2	8,994.1	345.9	8,648.2	6.3%	137,445.7	2.0%	25.0%	103,084.3	8.4%	0%	0.0
															Total ECL (USD mil)			2,080.5
															ECL as % of initial exposure			2.1%

Projecting ECL provisions

- So far, we have only estimated the amount of provisions needed at a certain point in time, taking into account

  - historical information (typical evolution and correlations captured by a scoring model or macro credit risk model)

  - current information (current parameters)

  - forward-looking information (forecasts, projections)

- What if we want to project ECL provisions say 1 year ahead?

- We would need to estimate:

  - The portfolio breakdown 1 year ahead into Stage 1, Stage 2 and Stage 3, projecting the flows between stages over a year

  - => we need a transition matrix

  - Information (estimates) about ECL parameters for the appropriate stages 1 year ahead, i.e. future PDs, LGDs, EADs etc.

Conclusions

- IFRS 9 expected credit loss provisioning replaced the incurred loss provisioning of IAS 39 in 2018

- Estimating the ECL provisions requires using credit risk parameters as well as models to project their future evolution depending e.g. on macro-economic developments

- A large "cliff effect" was introduced in IFRS provisioning model when exposures move from Stage 1 (1-year expected loss) to Stage 2 (lifetime expected loss)

  ◦ The US GAAP, also reformed recently, ask for lifetime expected loss already for Stage 1 loans, removing the cliff effect (a more consistent treatment)

- While the creation of provisions has effectively become more forward looking and created some buffers in the banking system, it is questionable whether the new approach is sufficiently countercyclical (Reading 4: Huizinga and Laeven, 2019)

References

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Key terms from Lecture 10 / IFRS 9

- PDs – cumulative, unconditional, conditional

- Expected credit loss (ECL) provisioning

  ◦ Stage 1 loans: performing loans, provisions equal to 12M expected loss (PDxLGD)

  ◦ Stage 2 loans: "underperforming loans" (significant increase in credit risk SICR, 30 days past due rebuttable presumption), provisions equal to lifetime (LT) expected loss

  ◦ Stage 3 loans: non-performing (defaulted) loans, provisioning equal to expected loss assuming PD=100% (i.e. LGD or weighted LGDs)

- ECL needs to be estimated in each point in time (such as end-month, end-quarter) using historical, current and forward-looking information including macro-economic outlook

- Projecting ECL provisions requires a transition matrix to project the flows among Stages + medium-term outlook for relevant credit risk parameters