

Credit risk Modelling

The likelihood that a borrower would not repay their loan to the lender is called Credit Risk

A borrower not being able to repay their debt is called default event

Lender knows that there is a certain amount of risk associated with every borrower Expected loss - unexpected loss - Result of adverse economic circumstances Exceptional(Stress) losses - Result of severe economic downturn

Estimating expected loss (expected Credit loss):

The amount a lender might lose by lending to a borrower.

$$EL = PD * LGD * EAD$$

PD: Probability of Default LGD: Loss Given Default EAD: Exposure at default

Probability of Default(PD):

The borrowers inability to repay their debt in full or on time.

Loss given Default(LGD):

The proportion of the total exposure that can not be recovered by the lender once a default has occurred.

Exposure at Default(EAD):

The total value that a lender is exposed to when a borrower defaults.

Calculating expected loss:

Customer wants to buy a house of \$500,000
Bank will fund 80% of the purchase --- Referred as Loan to value

loan to value = 80%

loan amount = 80% of \$ 500,000 = \$ 400,000

by now borrower has paid = \$ 40,000

Outstanding balance = \$ 360,000

If borrower defaults then EAD = \$ 360,000

Assume that there is empirical evidence that one in four homeowners have defaulted in previous years.

So probability of default (PD) = 1/4 = 25%

If customer defaults then bank can sell the house immediately at \$ 342,000

Total EAD = \$ 360,000

Bank can recover \$ 342,000

then remaining loss = \$ 18,000 (EAD)

LGD = \$ 18,000 / \$ 360,000 = 5%

If bank has to calculate the expected loss for that exposure in this very moment

= PD * LGD * EAD

= 25% * 5% * \$ 360,000

= \$ 4,500

Capital Adequacy, Regulations, and the Basel II Accord:

Banks must conduct their business without risking the stability of the economic system

Regulators Rules:

Regulate bank operations and hence reduce risky behaviour

Guarantee to the public that the banking system is in good health

capital Requirement(aka capital adequacy or regulatory capital)

Capital Adequacy ratio(CAR) :

(capital/Risk-weighted assets(Loans))>= 8%

One of the most important document that prescribed how much :

1. How much capital banks need to have

2. How capital is defined

3. How capital is compared against risk weighted assets

is the Basel II Accord

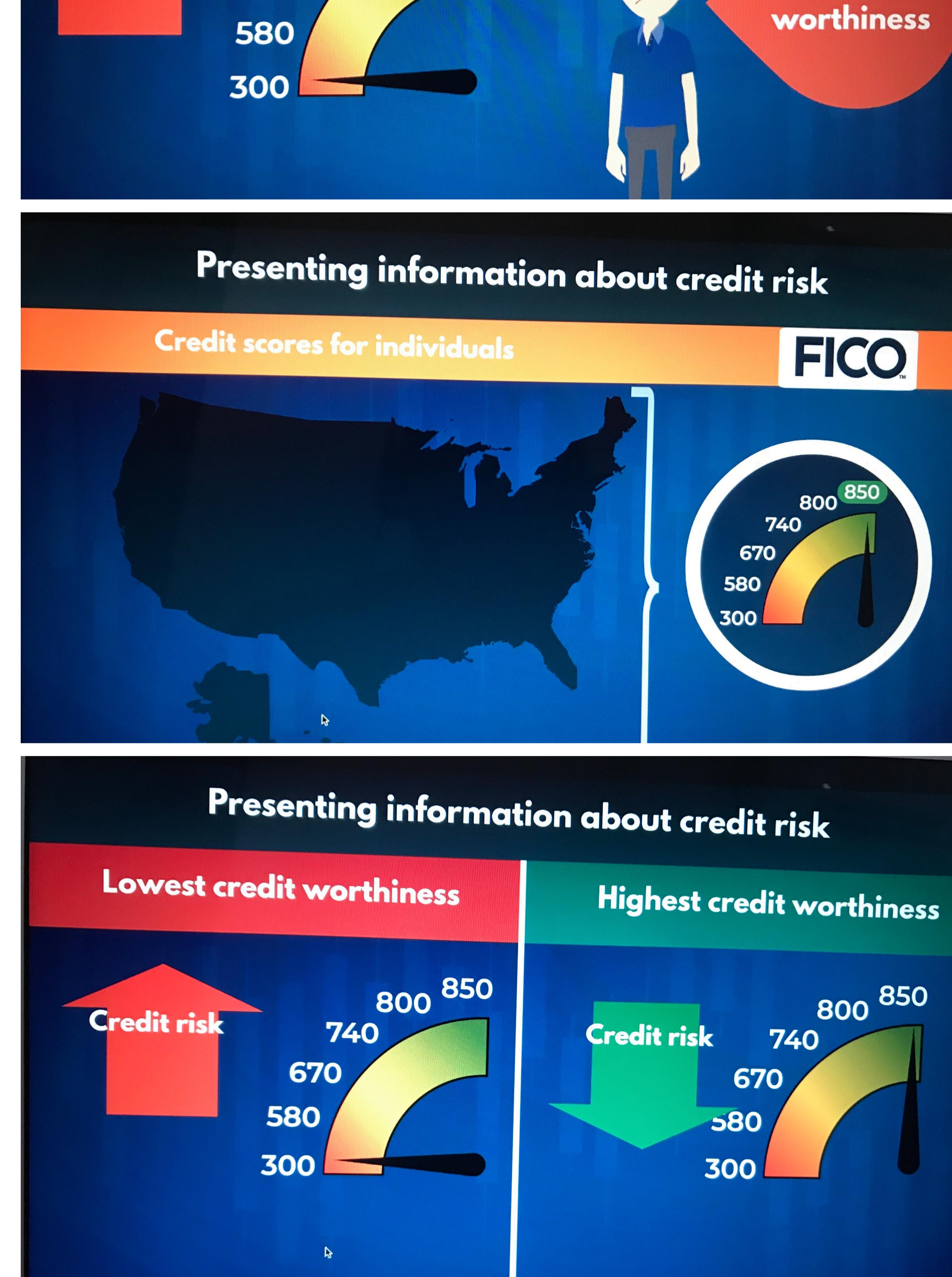
The greater the Risk a bank is exposed to, the greater the amount of capital it needs to hold to safeguard its solvency and overall economic stability.

Pillars of Basel II Accord:

1. Minimum capital Requirements

2. Supervisory Review

3. Market Discipline

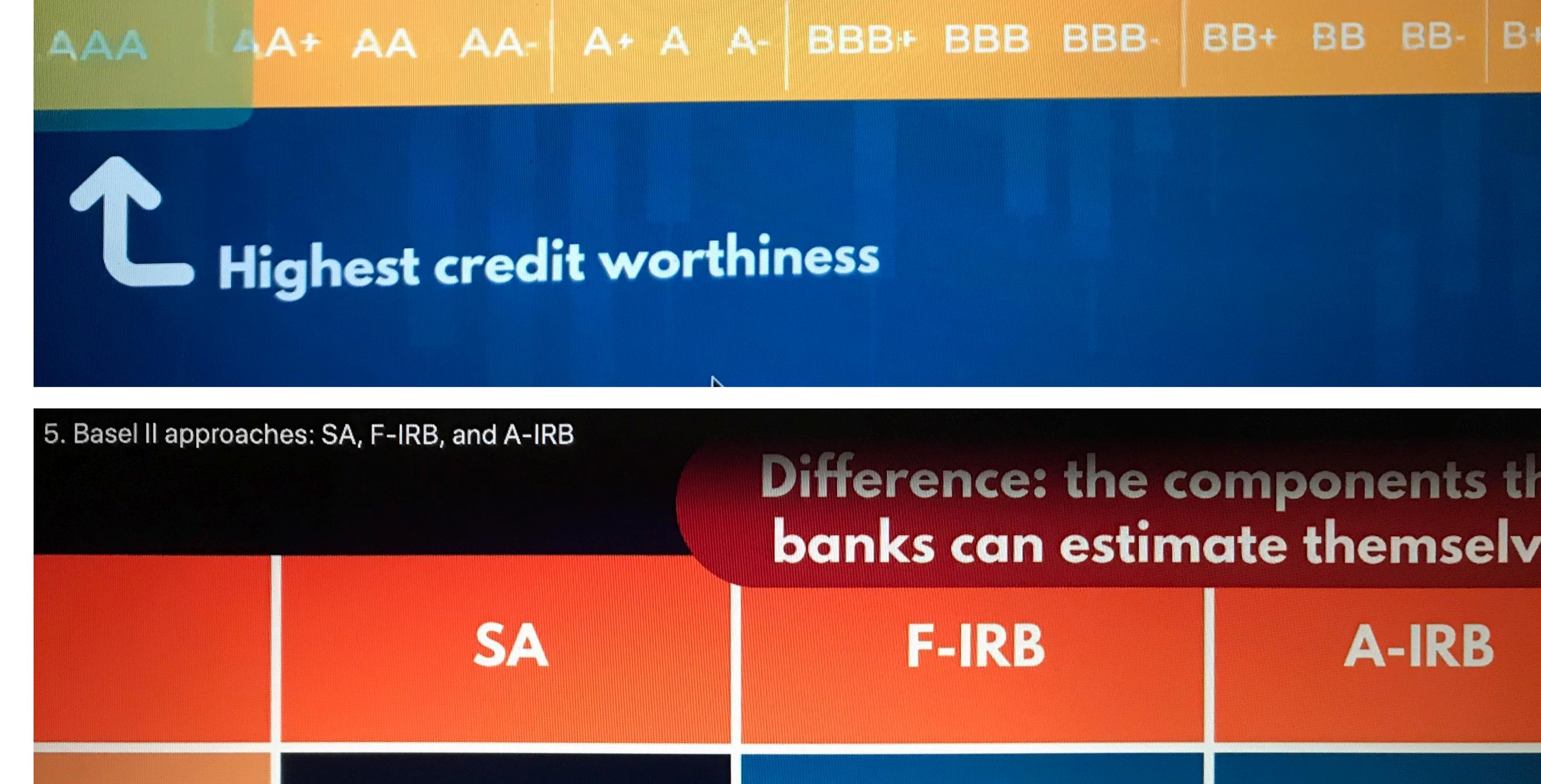


LGD : % of exposure in case of default (the portion that is expected not to be recovered)

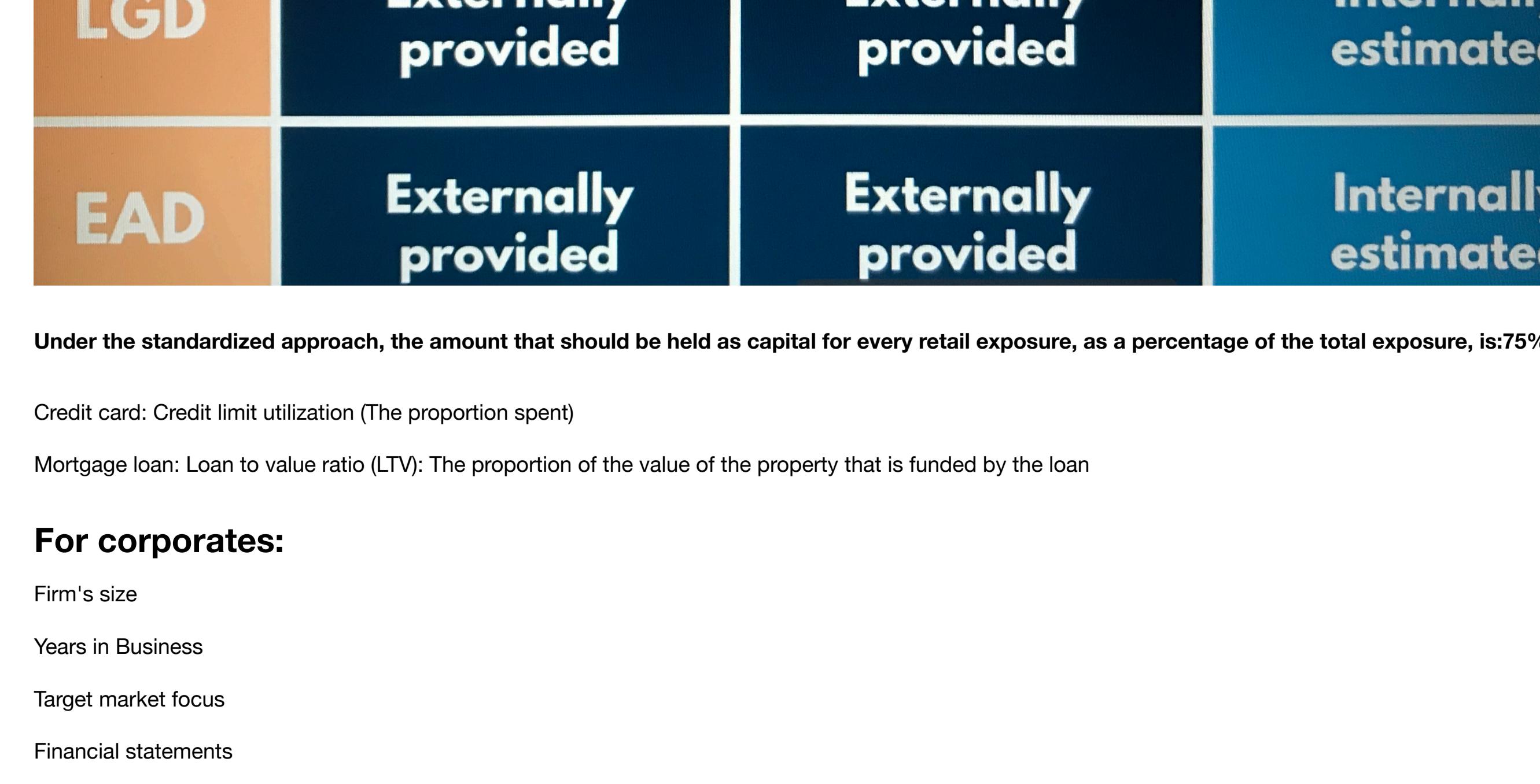
Basel II Approaches:

FICO	S&P Global	MOODY'S	Fitch Ratings
PD	SA Externally provided	F-IRB	A-IRB
LGD	Externally provided		
EAD	Externally provided		

Presenting information about credit risk



Presenting information about credit risk



Under the standardized approach, the amount that should be held as capital for every retail exposure, as a percentage of the total exposure, is: 75%

Credit card: Credit limit utilization (The proportion spent)

Mortgage loan: Loan to value ratio (LTV): The proportion of the value of the property that is funded by the loan

For corporates:

Firm size

Years in Business

Target market focus

Financial statements

Return on assets (ROA) = Net income / Total assets

Return on equity (ROE) = Net income / shareholders' equity

Current ratio = Current assets / Current liabilities

Debt ratio = Total Liabilities / Total Assets

In []:

Difference: the components that banks can estimate themselves

	SA	F-IRB	A-IRB
PD	Externally provided	Internally estimated	Internally estimated
LGD	Externally provided	Externally provided	Internally estimated
EAD	Externally provided	Externally provided	Internally estimated

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