

Dynamic risk management

IRRBB – risk management strategies

19 May 2021

EFRAG TEG: Paper 06-03



European Financial Reporting Advisory Group



DISCLAIMER

This paper has been prepared by the EFRAG Secretariat for discussion at a public meeting of EFRAG TEG. The paper forms part of an early stage of the development of a potential EFRAG position. Consequently, the paper does not represent the official views of EFRAG or any individual member of the EFRAG Board or EFRAG TEG. The paper is made available to enable the public to follow the discussions in the meeting. Tentative decisions are made in public and reported in the EFRAG Update. EFRAG positions, as approved by the EFRAG Board, are published as comment letters, discussion or position papers, or in any other form considered appropriate in the circumstances.

OVERVIEW

Introduction

Feedback

- Overall risk strategy
- Risk limits in the context of risk appetite
- Risk identification
- Measurement of risk
- Hedging activities
- Hedge accounting

Question to EFRAG TEG – slide 23

Glossary





INTRODUCTION

INTRODUCTION

IRRBB

When discussing dynamic risk management in the context of banks, the discussion focuses on interest rate risk in the banking book as this has significant implications for the net interest income of banks.

The trading book may also have interest rate risk exposures, these are often short term and the result of trading activities rather than activities like deposit-taking or lending.

INTRODUCTION: banking vs trading book

Trading book

- Positions held with intent of short-term resale or to benefit from price fluctuations/lock in arbitrage profits
- Positions intended to hedge elements of trading book
- Positions should be frequently valued
- Portfolio should be actively managed

Banking book

- Positions held to maturity/for the long term
- Related derivatives
- Positions not fair valued but carried at amortised cost (excluding derivatives)

Please note that this is a simplification of the requirements.

INTRODUCTION

Interest rate risk and its components

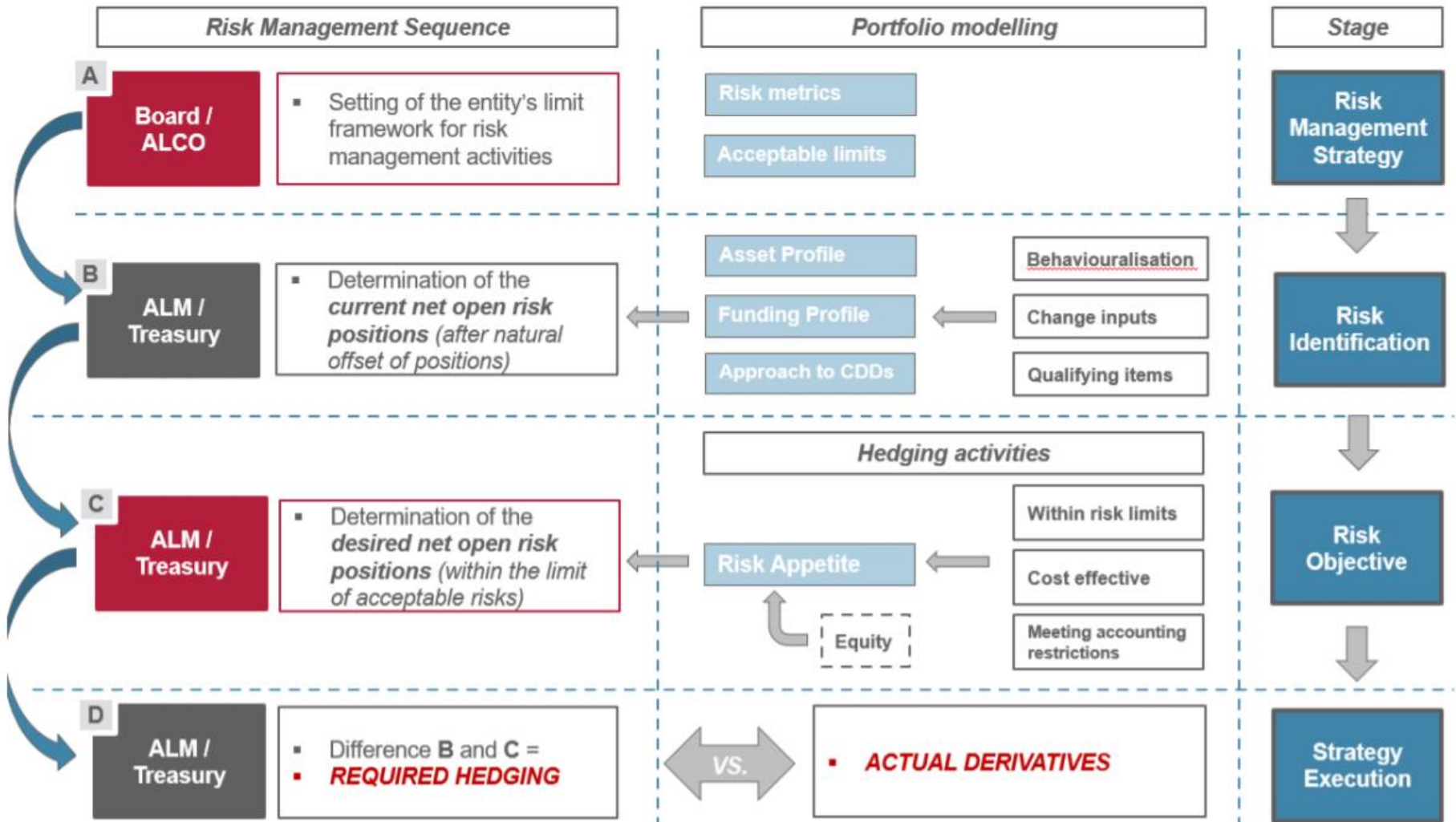
The current or prospective risk to both the earnings and the economic value of an institution arising from adverse movements in interest rates that affect interest rate sensitive instruments, including gap risk, basis risk and option risk.

EBA IRRBB Guidelines

- **Gap/Repricing Risk:** Risk from the timing mismatch in the maturity or repricing of assets, liabilities, and off-BS positions
- **Option Risk:** Risk from options (embedded or stand-alone) that changes interest rates will lead to exercise of options or change in client behaviour for embedded options such as prepayment options in mortgages.
- **Basis Risk:** Relative changes in interest rates for financial instruments with similar tenors but priced under different interest rate indices (e.g., 3-month Libor or 3-month Euribor). It arises from imperfect correlation in the adjustment of rates on different instruments with otherwise similar rate change characteristics.

Overview of risk management activities

Source: IASB April [Agenda paper 4B](#) Appendix A





FEEDBACK

Feedback on risk management strategies

OVERALL STRATEGY

Participants indicated (with a mixture of emphasis) that they focus on two aspects:

- Short term: **stabilise net interest** (**NII*** or **NIM***)
 - Longer term: **optimise/stabilise EVE***
-
- In some cases stabilisation of the net income margin may involve hedging the net exposure at fixed rate currently such to manage the change from fixed rate interest income to partly variable rate interest expenses in the future periods.
 - One participant referred to the transformational nature of a bank that creates values to the real economy by providing certainty of cash flows thus enabling investment and reducing the impact of interest rate changes on the credit cycle.

* These items are defined in the glossary

Feedback on risk management strategies

OVERALL STRATEGY – AN EXAMPLE

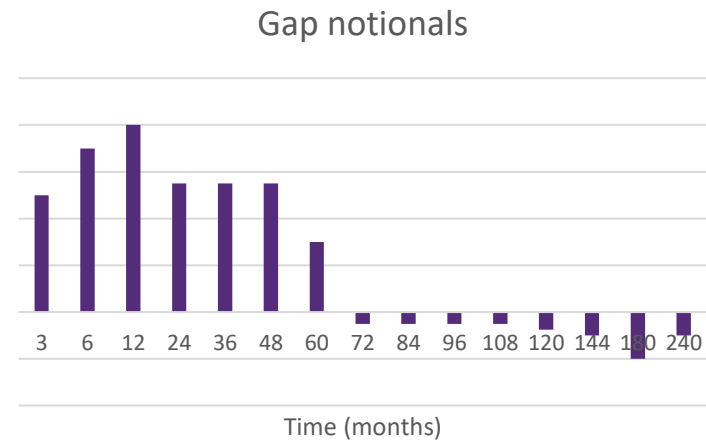
The long-term goal of interest rate risk management is to **optimise the risk and return of the IRRBB**, while adhering to internal and external constraints. The IRR position is the **net position between assets and liabilities** after hedging which is subject to a defined a target **repricing gap profile**. The position can be described as follows:

- **Total value exposure:** the total value sensitivity is implicitly constrained by regulatory metrics
- **Option-related value exposure:** largely due to prepayment options and mainly present in longer tenors. Not visible in the repricing gap profile
- **Repricing gap profile value exposure:** this originates from expected principal and interest cash flows per the repricing gap profile. The distribution of exposure follows an optimal investment rule, leading to an optimal mismatch NII.

This **optimal investment profile** is within the internal and external checkpoints and limits and aims to find an optimum between the height and stability of the resulting income mismatch. The resulting position consists of two components:

- Long (**asset**) **position** – in the maturity buckets **3 to 60 months** and spreads out the mismatch position up to five years, stabilising the mismatch NII; and
- Hedge of **option-related exposure** (primarily from mortgages) – in maturity buckets **72 to 240 months** and hedges option-related exposure and creates room to stabilise mismatch NII.

Visually this can be represented as follows:



Feedback on risk management strategies

SETTING RISK LIMITS

The driver of the impact on **NII** or **EVE** is the re-pricing dates of the instruments. This is also true of variable instruments that may re-price within a 3- or 6-month window depending on the contractual terms.

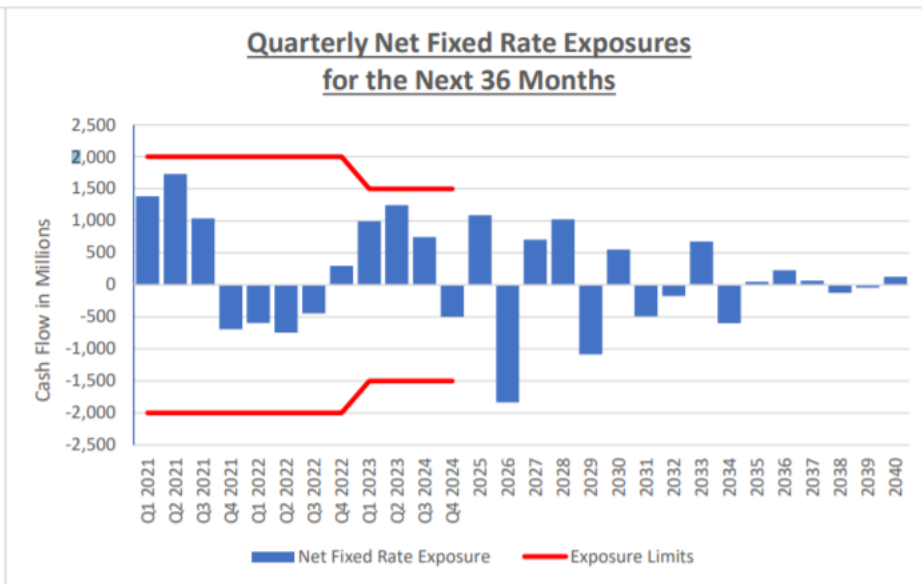
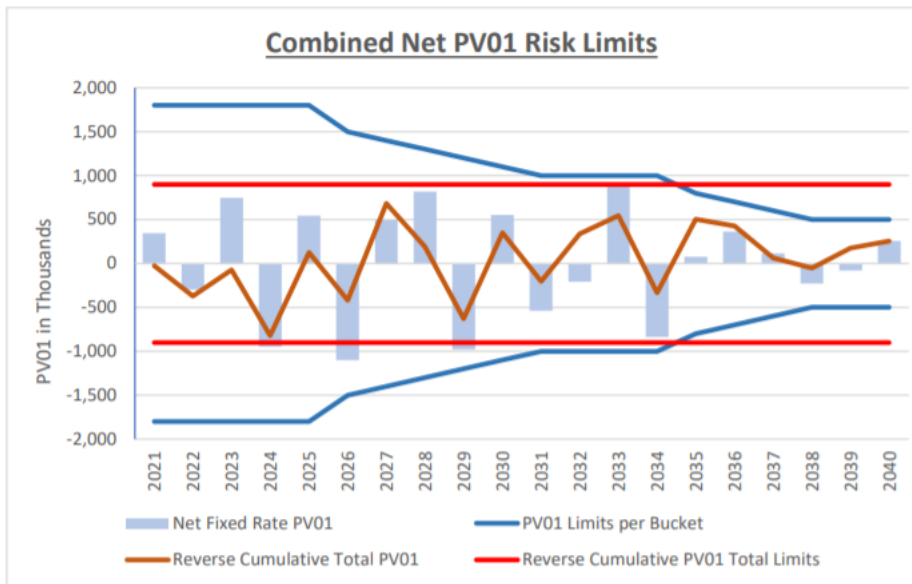
Due to both the number of transactions in the Banking Book and the behavioural component of those transactions (e.g. deposit stability or loan prepayment), it is impossible or in some cases undesirable to fully offset all **IRRBB** exposures. That is the reason why banks manage their IRRBB exposure within acceptable ranges.

Source: IASB April agenda [paper 4B](#)

Feedback on risk management strategies

SETTING RISK LIMITS (2)

Several banks in the outreach used **PV01** risks when determining the acceptable limits based on the Board's risk appetite. Others may supplement this by setting limits for the short term impact of repricing. Banks may, for example, focus on the **NII** variability for the first 36 months and only consider later exposures when they fall into that window.



Source: IASB April agenda [paper 4B](#)

Feedback on risk management strategies

SETTING RISK LIMITS (3)

1. Some banks determine limits at board level or as approved by the group risk committee. Others have decentralized risk limits but decisions about the hedging or not within the limits would be decided by the business unit. Some with decentralized limits would have an overview on group level whereas in a minority of cases this was not the case. In one bank, business units hedged all loans being sold based on transfer pricing limits and the daily flow reported to treasury. This flow book cannot have a significant gap. Then on a global basis, an open risk position is selected, and limits are being defined both from an **EVE** and earnings perspective.
2. For some, limits were determined with respect to equity or capital; or based on absolute numbers per bucket for synthetic and inflation gap risk as well as NPV sensitivity limits for interest rate risk, interest rate and inflation risk, as well as basis risk. **VaR** was also considered in some cases. One bank starts with the income statement and applied several scenarios. For example, if interest rates increase by x bps, the limit was defined as no loss greater than y%. Based on these scenarios, the limits are defined. Treasury is free to trade within the limits. The open position was about 5 to 10% of the interest risk exposure. In setting the limits they estimated the value of that 10%, and the outcome provides information on how much value could be created or lost over time. The bank noted there was a difference between strategic positions (stabilizing) and taking market positions. When rates go lower, with a detrimental for the **NIM**, certain trades can lessen the impact.

Feedback on risk management strategies

RISK IDENTIFICATION: CENTRALISED/DECENTRALISED

1. In some banks interest rate risk management was decentralized to the units/business lines within its own limits. These units also apply intercompany hedges. Some also do a comprehensive assessment at group level.
2. For these banks hedge accounting was applied on two levels:
 - First, hedge accounting was applied to the aggregated positions of the individual units.
 - Second, hedge accounting was applied also at interest rate risk at group level. Interest rate risk was externalized – based on a consolidated view of the positions at group level by the group treasury.
3. Others work on a centralised basis with a centralised team in Group Treasury.
4. Natural offsets between assets and liabilities form an essential part of the risk management strategy.

Feedback on risk management strategies

RISK IDENTIFICATION: ITEMS INCLUDED IN RISK ASSESSMENT

1. Future business was incorporated in many cases
2. Banks consider equity as a source of funding that economically needs to be rewarded and so will hedge it like other sources of funding to protect the ability to pay dividends.
3. Core demand deposits and mortgages/loans on a behaviouralised basis are a major source of interest rate risk exposure
4. Investments under FVOCI (not considered as part of core model)
5. Other funding sources such as large issuances (currently often micro-hedged) but considered as part of the overall risk profile.

Feedback on risk management strategies

RISK IDENTIFICATION: BEHAVIOURALISATION

1. While the contractual terms may indicate certain exposures, through experience, banks understand that while deposits may be available on demand, they may be 'sticky' and stay around for a long time. House mortgages may have a contractual term of for example 20 years but are often renegotiated or repaid after say 8 years.
2. Therefore, participants model this behaviour (known as behaviouralisation) to identify actual interest rate risk exposure.
3. While changes to these methodologies are possible they are not expected to occur frequently. However, the inputs to the models are constantly evaluated and updated to take cognisance of market changes (also required by regulators).

Feedback on risk management strategies

MEASUREMENT OF RISK

This is an example of the types of risks and the types of metrics used to assess different risk factors

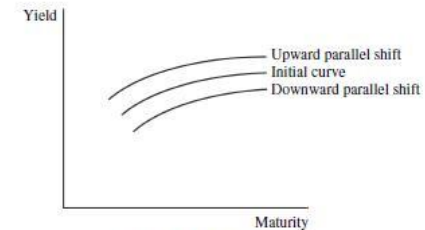
	<i>Metrics based on 1bp moves</i>		<i>Metrics based on larger moves in risk factors</i>		
	PV01	CS01	Value sensitivity	Stress with liquidity adjustments	VaR
Risk considered	Interest Rate Risk	Credit Spread Risk	Interest risk and Credit spread risk	Comprehensive stress test scenario including IR, FX and CSR	Statistical stress test incl IR, FX and CSR
Interest rate risk	1bp increase in rate across all tenors for all currencies		300bps increase and decrease in rate across all tenors for all currencies	- x specified stress scenarios (e.g.severe Eurozone crisis, US monetary crisis) including IR, FX, CSR shocks - Worst-case economic loss is chosen - Liquidity adjust holding periods reflect time needed to reduce/hedge risk position of each risk factor (i.e. replaces standard VaR holding period)	Value at risk assuming past market shocks and representing a maximum 10 day economic loss in 95% of the cases
Credit Spread risk		1bp increase in credit spreads	Xbps increase for 2 years and then Ybps increase for the rest of the tenor		
Other (fx, equity)					
Rationale	Day to day risk management. Contribution of each transaction visible in the risk profile	Sensitivity to credit spreads - insensitive to benchmark, e.g. HQLA portfolio	Reflects potential loss on PV basis of a combination of IRR and CSR shocks	A market risk stress measure that reflects potential economic loss under worst stress scenario. Longer (liquidity adjusted) holding period than VaR	Standardised statistical measure of market risk reflects potential economic loss over a set period holding period at an established confidence level

Feedback on risk management strategies

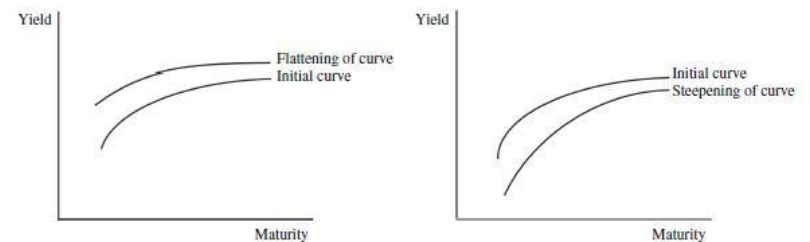
MEASUREMENT OF RISK

1. Some banks use various scenarios to reflect potential changes in future interest rates, not merely parallel shifts but including the impact of steepening and flattening of the yield curves
2. One bank calculates IRR as the sensitivity of the net present value of the net positions in the time buckets based on a 1-basis-point change in market swap rates. Risk limits are also defined in PV01 terms as well as Value-at-Risk limits.
3. PV01 calculations may be done by a specialist system (i.e. not the hedge accounting system) on a tenor-by-tenor basis. It is also measured separately for assets and liabilities.

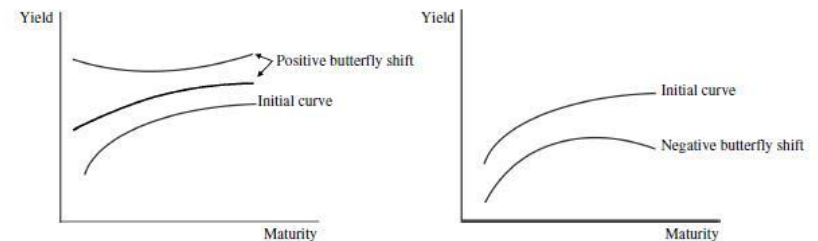
Non-parallel shifts in the yield curve



(a) Parallel shifts



(b) Nonparallel shifts: Twists (steepening and flattening)



(c) Nonparallel shifts: Butterfly shifts (positive and negative)

Fixed Income Analysis - Fabozzi

Feedback on risk management strategies

HEDGING ACTIVITIES

Instruments used

ALM derivatives are entered in a buy and hold to maturity like the transactions they mitigate their IRR and once entered into form an integral part of the Banking Book. In most cases interest rate swaps are used. One bank commented that swaptions create significant earnings volatility due to **vega** risk while another noted that some of their entities make use of caps and floors in their interest rate management. Others indicated that IAS 39 makes the use of options less attractive.

One bank attracts forex funding, which is swapped to EURO floating. These are then combined with other EURO positions.

Feedback on risk management strategies

HEDGING ACTIVITIES

No single preferred outcome

As explained in paper 06-02, all banks agreed that as long as the bank is within the risk limits, no further direction is provided as where within the limits would be preferable. Treasury may change its evaluation of the preferred outcome within a day or daily or weekly but the overall focus is staying within the risk limits.

Evaluation of risk activities

As long as the entity has not breached its limits, there is no further investigation as to the effectiveness or not of the strategies or whether other strategies would have been better in the circumstances.

Effectiveness testing for hedge accounting purposes are conducted as required.

Feedback on risk management strategies

HEDGE ACCOUNTING

Mix of micro/macro hedges currently

Most participants apply hedge accounting under IAS 39 (carve out) for items such as core deposits or mortgages. Portfolios are generally rebalanced monthly, and it is rare to rebalance within the month. While risk management activities are done on a net basis; hedge accounting is done on a gross basis as required by IAS 39. Micro hedges are generally used for issuances or bonds and FVOCI portfolio.

Benchmark rate hedged or entire cash flow (i.e. including credit spread)

Both were hedged as allowed by the regulations

Question for EFRAG TEG

1. Does EFRAG TEG have observations or questions on the risk management practices as described?



GLOSSARY

Glossary

CS01: The risk that arises from the “unfavorable” change in bond values (or values of credit derivatives such as credit default swaps) in response to changes in underlying credit spreads.

EVE: economic value of entity: a cash flow calculation that takes the present value of all net cash flows and is a long-term economic measure used to assess the degree of interest rate risk exposure.

Hedging equity: The objective of investing the equity against a rolling benchmark portfolio, is to generate a stable NII contribution where this benchmark can be defined as the liability that has to be hedged.

IRRBB: interest rate risk in the banking book

NII or NIM: Net interest income or Net interest margin (i.e., after interest expense)

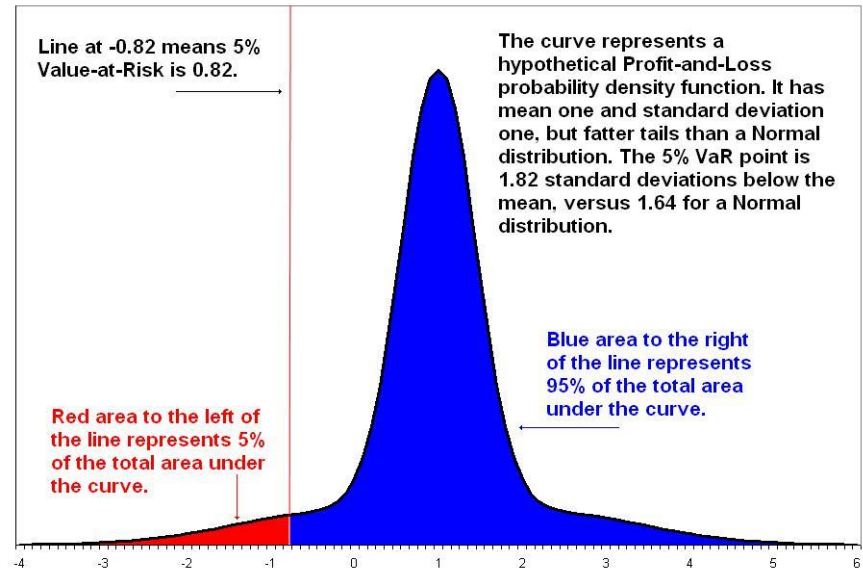
PV01: also known as the basis point value, specifies how much the price of an instrument changes if the interest rate changes by 1 basis point (0.01%). If PV01 for a bond portfolio is EUR 2 million that means 0.01% interest rate movement either way will change portfolio price approximately by 2 million. If the PV01 limit for the portfolio is set as EUR 2 million that means a loss of EUR 2 million for 0.01% rate hike is acceptable. Various formulae available depending on the item it is calculated for, e.g., swap, bond or portfolio.

Feedback on risk management strategies

GLOSSARY

VaR: (value at risk) - estimates the loss for an investment or investment portfolio might lose (with a given probability), given normal market conditions, in a set time period such as a day. The VaR would change depending on the probability, the set time period and the input days chosen.

Vega: focuses on changes in expectations for future volatility, i.e., it is the measurement of an option's price sensitivity to changes in the volatility of the underlying. It is the amount the option's price change to a 1% implied volatility of the underlying.



From Wikipedia



EFRAG receives financial support of the European Union - DG Financial Stability, Financial Services and Capital Markets Union. The content of this presentation is the sole responsibility of EFRAG and can under no circumstances be regarded as reflecting the position of the European Union.

Photo on front page by [Sammie Chaffin](#) on [Unsplash](#)



EFRAG
Aisbl - ivzw
35 Square de Meeüs
B-1000 Brussel
Tel. +32 (0)2 207 93 00
www.efrag.org

