

Brussels, 1 July 2014

Launched in 1960, the European Banking Federation is the voice of the European banking sector from the European Union and European Free Trade Association countries. The EBF represents the interests of some 4,500 banks, large and small, wholesale and retail, local and cross-border financial institutions. Together, these banks account for over 80% of the total assets and deposits and some 80% of all bank loans in the EU alone.

INTEREST RATE RISK IN THE BANKING BOOK

The EBF as a member organization of the International Banking Federation has been involved in discussions in preparation of the joint IIF/IBFed paper “*Interest Rate Risk in the Banking Book (IRRBB) – Industry perspective*” and would like to express its full support to the views articulated in the paper that has been submitted to the Basel Committee on Banking Supervision Interest Rate Risk Task Force (TFIR) on 26 June 2014 <http://www.ibfed.org/news/iif-ibfed-june-2014-irrcsr-letter>

This EBF paper is complementary to the IIF/IBFed paper and further elaborates on the reasons why Pillar I approach cannot be considered an appropriate prudential framework for addressing the interest rate risk in the banking book (IRRBB).

The EBF paper is addressing the concerns expressed by regulators in relation to the raising interest rate environment and potential regulatory arbitrage, explains the different nature of the interest rate risk in the banking book (BB) compared to the trading book (TB) as well as composition and nature of the BB exposures themselves. The paper further addresses the variations in Non-Maturing Deposits (NMDs) characteristics and approaches and explains why any standardized approach to NMD modelling prescribing a defined repricing term in IRRBB measurement could not represent a workable solution. The paper also presents the most common approaches to equity consideration in IRRBB and describes the two risk measurement approaches applied in the banking industry to capture the risks inherent within IRRBB. To engage constructively in the dialogue with regulators, the EBF is offering guiding principles that could be put in place in order to strengthen the principles for internal interest rate risk management, measurement and capital allocation in combination with enhanced early warning indicators including an enhanced economic value based standardized outlier test.

Key messages:

- **The different nature of the interest rate risk in the banking book when compared to the interest rate risk in the trading book as well as the variety of the products, approaches and assumptions to be made around certain products across banks and jurisdictions make IRRBB standardization under Pillar I approach inappropriate.**
- **Simple standardized sensitivity based model would not only be decoupled from banks’ risk management practices resulting in significant deviation from the**

actual risk exposures but also unable to capture the complexity related to interest rate risk modelling such as reflection of the behavioural optionality in assets and liability and derivation of risk profiles of non-maturing deposits NMD and equity. Concerning behavioural and conventional exposures, the EBF recommends that institutions apply their own models in order to determine the tenor and volume over time of them.

- **Given the inappropriateness of defining a one size fit all approach, the banking industry recommends a Pillar II framework based on strong IRRBB governance principles, strengthened supervisory reporting framework and early warning indicators enabling supervisors to determine outlier banks in terms of IRRBB.**
- **EBF recommends to enhance the current economic value based standardized outlier test (SOT) to serve as an early warning system to identify outlier banks, however, considering its limitation, it cannot be used for deriving a prudential capital charges in Pillar I framework.**

I. GENERAL CONSIDERATIONS

We understand that the Basel Committee on Banking Supervision (BCBS) initiative on interest rate risk (IRR) and credit spread risk (CSR) in the banking book (BB) aims primarily at addressing potential loss of economic value of institutions from increase in the interest rates and preventing potential regulatory arbitrage.

While we also understand that all the options remain open and the BCBS TFIR is to investigate several solutions, the objective of this paper is to demonstrate that given the nature of the banking book exposures itself and the differences between trading book (TB) IRR and IRRBB as well as large variety of approaches and models due to jurisdictional reasons, a pillar I prudential framework is not appropriate, and a pillar II prudential framework should be retained.

As demonstrated throughout the paper, in our view, it is not appropriate to define a supervisory capital metric which would only roughly take the complexity of all determining variables into account. Regulators would have to design a measurement system that could be applied by all banks of all sizes and levels of sophistication and that are using different measurement/management approaches, reflecting differences in jurisdictional characteristics and business models.

As explained further, a simple sensitivity based model will not be capable of correct portrayal of the risks. Therefore, it cannot be considered a suitable basis for a capital charge. The results of such a static supervisory model will deviate significantly from the actual risk exposures of banks.

Besides, the real crucial questions related to interest rate risk modelling, such as how to reflect the behavioural optionality in assets and liability (prepayment/early withdrawal clauses) and how to derive the risk profile of non-maturing deposits cannot be solved by a one-size-fits-all approach. For example, a possible supervisory determination of an average duration of non-maturing deposits could in some instances penalize key retail activities, especially long-term fixed-rate lending to individuals and SMEs.

Hence, we believe that supervisory guidelines relating to the behavioural assumptions such as the average duration of non-maturing deposits should primarily focus on implementation of effective and appropriate governance arrangements rather than attempting to define one rule that would be applicable to all.

The banking industry recommends a pillar II framework based on the following general principles

- a) Strong IRRBB governance;
- b) Strengthened supervisory reporting framework that will enable supervisors to conduct transversal analyses on most important assumptions (e.g. non-maturing deposits, investment of equity) while being consistent with the idiosyncrasies by jurisdictions, products and business models;
- c) Early warning indicators that will enable supervisors to determine outlier banks in terms of IRRBB

a) Strong IRRBB governance :

As described in the IIF paper, the EBF supports a strong IRRBB governance based on:

- Comprehensive governance framework and processes covering:
 - Clear responsibility allocations to Board, senior management, IRRBB management function, independent oversight;
 - Documentation of methodology, data, assumptions and monitoring of actual implementation with review of the most important assumptions to the Board (including the target duration of equity)
- Sound IRRBB measurement framework based on:
 - Identification of all material sources of IRRBB;
 - Stress testing of interest rate scenarios or breakdown of assumptions;
 - Going concern approach with net interest income perspective and/or dynamic economic value perspective.

b) Strengthened supervisory reports:

The EBF supports an enhanced supervisory reporting framework that would enable supervisors to analyze the extent of the IRRBB, while remaining consistent with the idiosyncrasies of the BB items.

Such supervisory reporting framework could cover:

- i. significant non-maturing deposits broken down by:
 - customer types (e.g. retail, SME, corporate, other);
 - country in which the deposits are collected;

For each deposit type the balance volatile, the average pass through rates and the repricing maturity ladder used in the IRR sensitivity indicators could be reported.

- ii. the duration that is targeted for equity

Such a supervisory reporting framework would, in our view, provide sufficient data allowing supervisors application of transversal analyses.

c) *Early warning indicators:*

To enable supervisors to determine whether a bank could be considered an outlier in terms of IRRBB, EBF suggests that consistent early warning indicators are provided to supervisors on a regular basis:

- net interest income-based sensitivity indicators
- economic value-based sensitivity indicators

These sensitivity indicators would be:

- i. standardized for:
 - the interest rate scenarios to envisage (some of which could be environment dependent and be defined on an ad-hoc basis by supervisors);
 - the threshold to determine whether a bank is outlier in IRRBB;
 - the horizon over which it should be calculated;
- ii. based on the bank assumptions (subject to the strong governance requirements mentioned above) including the target duration of equity and the assumptions on non-maturing deposits that are also described in the supervisory reporting framework.

As mentioned in the opening paragraph, we understood that the TFIR aims at addressing potential loss of economic value of institutions from increase in the interest rates. In this regard, we would like to stress the difference between *variability risk* and *loss risk* whereby

- *variability risk* means that a risk metric is sensitive to a change in interest rates;
- *loss risk* means a loss of capital

For instance, future net interest income can depend on future interest rates, i.e. there is net interest income variability risk, without creating loss risk if they remain positive. This is fundamentally different from the interest rate risk in the TB where variability risk and loss risk are the same since transactions are accounted for their economic value since their inception. Hence, a decrease in a trading transaction's economic value leads to loss.

As transactions in the banking book are accounted for amortized cost through earnings, and as they are not necessarily originated at par¹, net interest income could be sensitive to interest rates without being negative. For instance, non-interest bearing deposits can't lead to negative net interest income.

While management of IRRBB should consider both variability risk and loss risk, prudential framework should focus on loss risk.

II. ADDRESSING THE CONCERNS RELATED TO INCREASE IN THE INTEREST RATE LEVELS AND REGULATORY ARBITRAGE

a) Increase in the level of interest rates

To address the concerns associated with an increase in interest rates, we believe there is a need for a thorough analysis whether an environment of rising interest rates necessarily translates into risk for banking industry before any conclusion is drawn. Risks originated by such environment depend on each bank's balance sheet.

It should be noted that for retail banks, a rising rate environment is usually *beneficial* to the bank since low interest bearing deposits, including non-interest bearing deposits, are invested at higher rates².

For any regulatory framework for IRRBB, a consistency validation process should be in place ensuring that the results are meaningful. Should a regulatory metric be introduced to indicate the risk associated with the rise in interest rates whereby the bank's earnings actually increase with the rise in interest rates, the risk metric should be assessed in light of behavioral and conventional assumptions.

b) Composition of the Banking book and prevention of potential boundary arbitrage

To address the issue of potential arbitrage, it is necessary to understand the nature of the BB exposures, the related interest rate risk and the differences with the TB.

Composition of the banking book

A defining characteristic of BB is that it is essentially composed of:

- Transactions that are originated to be held to their maturity,
- Risk mitigation transactions (both interest rate and foreign exchange risk mitigating transactions relate exclusively from the risks originating from BB and *not* from TB) such as derivative transactions in the BB. Most will qualify as accounting hedges (fair value hedge or cash flow hedge) but occasionally some cannot be accounted for as hedging instrument and are accounted for held for trading even though the intention is to hedge a BB exposure.

¹ E.g. non-interest bearing deposits are accounted for their notional amounts even though they are below market rates and consequently have a positive embedded value for the bank.

²² Amount invested at higher rates is the stable portion of deposits not correlated with market rates

- Other types of transactions where the intent is not short term but they could be terminated before their maturity (e.g. Available for Sale portfolios that are purchased to build and maintain on an ongoing basis a liquidity buffer as required by the regulator. Those securities are therefore not purchased with the intent to generate short term profits³).

Most of the BB exposures are *not* traded and the economic value that can be calculated from discounting expected cash flows may be useful but remains theoretical since those values are not subject to price discovery process in a market.

Some instruments (derivatives) used in the BB are accounted for as Fair Value in the balance sheet and either accrual through Profit and Loss (cash flow hedge, fair value hedge) or fair value (when hedge accounting is not possible). Those instruments are executed with the intent to mitigate an IRR exposure derived from the bank performing its traditional bank-intermediated-financing functions (borrowing from agents with liquidity surpluses; lending to agents with liquidity deficits) and not with a trading intent.

Transaction allocation to the banking book

Banks have robust systems and controls in place to monitor that no trading intent exists (e.g. policies, procedures and governance) both before the fact and after the fact.

The IRRBB review should be looked at in conjunction with the work the BCBS is undertaking on the FRTB. The measures put in place under the FRTB aim at ensuring a strong governance process for classification into BB and TB, including limitation of transfer between the two books to exceptional circumstances. Those measures, strengthened with further measures put in place in the context of structural reform of the banking industry will in our view sufficiently address any potential arbitrage between the BB and TB.

Differences between IRRBB and IRRTB

A TB market risk arises from positions that are tradable, traded and can be hedged. The intent is to trade in order to profit on expectations of short-term price movements (as per the definition of the prudential TB). As TB transactions are entered into at par and are then accounted for their changes in values through P&L, a decrease in their value materializes in negative P&L.

Conversely, BB transactions are not all entered into at par (e.g. low- or non-interest bearing deposits have a positive embedded value since they are accounted for their notional amount and their interest is accrued through earnings). That is the reason why a change in interest rates may lead to lower earnings but positive earnings.

Alignment of the capital charge for IRRBB with the capital charge for market risks in the TB with the aim to avoid arbitrage would not be sensible due the very different nature and purpose of the TB and BB, as is further explained in this paper.

³ However, turnover can be seen in Liquidity buffers which also is consistent with Basel recommendations for the liquidity coverage ratio; “A bank should periodically monetise a representative proportion of the assets in the stock through repo or outright sale, in order to test its access to the market, the effectiveness of its processes for Monetisation, the availability of the assets, and to minimise the risk of negative signaling during a period of actual stress.”

We believe the differences in the nature of the IRRBB and the IRRTB need to be fully understood when designing the capital framework to avoid any unintended consequences (namely a reduced capability to lend to the economy and/or an increase in costs passed to customers) resulting from application of the same capital treatment regardless of the nature of the IRR.

Interest rate risk is defined as the exposure of a bank's financial condition to movements in interest rates. In this context interest rates refer to interest rate indices, for example LIBOR or EONIA, and therefore excludes non rate related components such as credit spread, liquidity spread, commercial margin etc. For the BB, changes in interest rates affect a bank's earnings by changing its net interest income (NII)⁴ as BB assets and liabilities are accounted for at amortized cost. They also affect the economic value of the bank's assets, liabilities, and off-balance-sheet instruments since the present value of future cash flows (and in some cases, the cash flows themselves) change when interest rates change.

Market risk relates to transactions that are negotiated by counterparties operating in the same environment where prices are observable and promptly tradable. This is not the case with IRRBB which, apart for the risk mitigating instruments, is originated by the relationship that the bank built with specific customers (retail, corporate and institutional clients). For example, implicit optionality cannot be treated as a financial market based option. For non-defined maturity products there are several options making risk management challenging; options available to customer, competitor and the bank. In addition, banking customers do not always have easy access to financial markets or even to credit, so the arbitrage-free-assumption framework used to price financial instruments and options in financial markets is not applicable to retail and commercial customers.

The BB is largely influenced by behaviors (customers, banks, competitors, regulatory environment) and conventions, which is to be considered when designing a regulatory framework⁵. This is a fundamental difference with the interest rate exposure from the TB that is substantially contractual in nature.

As said, the nature of IRRBB is to a large extent a combination of behaviors and conventions. Behaviors and business developments are not only based on efficient-financial-market-rationality. Behaviors can be driven by many other factors, including, for example, social and demographic circumstances. Those behaviors affect loans and deposits' balances (prepayment, rollover, product switching) and customer rates.

IRRBB is therefore dependent on those behaviors. Models are developed and maintained on the basis of a combination of historical data analyses and customer behavior assumptions as not everything can be derived from historical experience.

In order to manage the IRRBB, the modelled interest rate risk exposure must be translated into *theoretical marketable financial instruments* that are similar to those of the trading environment

However, this necessary exercise, which is useful for measuring, managing and disclosing on IRRBB, cannot lead to assimilate the very nature of BB items to that of TB's ones. In other words, BB items should not be assimilated to *actual* financial instruments that would build up

⁴ For completeness: Changes in interest rates can also affect a bank's earnings through other interest sensitive income and operating expenses.

⁵ Please refer to the IIF paper elaborating on the categories of the IRRBB nature

a TB and apply to those *theoretical instruments* a prudential treatment similar to the TB prudential framework. IRRBB should be considered in its entirety. It would not be appropriate to consider that this representation of IRRBB is a split between market risk-like financial risk and non- market risk because in reality they are intertwined.

III. NON MATURING DEPOSITS (NMDS)

As mentioned in Instructions for Basel III monitoring, a Non Maturing Deposit (NMD) can generally be defined as ‘deposits that the depositors are free to withdraw at any time’. This is a significant component of the BB liability as most retail deposits are NMD. Hence, the incorporation of NMDs is one of the most important issues to deal with in IRRBB.

Before further exploring the issue in more details, we would like to emphasize that we are convinced that there cannot be a one-size-fits-all approach for NMDs, given the high degree of heterogeneity of NMDs across jurisdictions, products, behavior and bank business models.

The categorisation used for liquidity stress tests analyses are not relevant for the management of IRRBB. Indeed, management of IRRBB is done on an ongoing basis perspective, with interest rate exposures derived from the combination of expected future balance and expected future customer rate: the duration of NMD increases with the expected stability of balances and with low responsiveness of customer rate to changes in market rates.

For liquidity risk management, it is prudent to assume that NMDs’ balances are running off. However, the adoption of a too short duration for NMD would lead the bank not to manage its IRRBB appropriately as the actual NMD duration would be longer than the modelled which would expose the bank to earnings volatility, in both rising and decreasing market rate environment. That is the reason why banks pay great attention to the continuous analysis of the duration of their NMDs.

More generally, using overly simplistic assumptions or ill-suited assumptions to define product buckets lead to inaccuracies in:

- estimation of liability duration,
- management of IRRBB,
- fund transfer pricing (FTP) that is used also to steer commercial force

The balance component and customer rate component that enables to derive interest rate exposure arising from NMDs are detailed below.

These analyses are done with a combination of historical data analyses and judgment when appropriate.

The set of assumptions is subject to strong governance that includes an independent review process (typically by risk department) and an approval process by senior management of the bank.

In addition, banks run regular stress tests on these assumptions to determine the impact of the assumptions on IRRBB. Those stress tests on assumptions complement the stress tests that are applied on the level of interest rates.

a. Balance component

i. Balance stability should be analyzed on a portfolio basis:

The analysis of a specific account or a specific depositor is not necessarily relevant to IRRBB analysis due to the diversification effect that occurs between depositors and products at the bank level, increasing the stability of NMD balances as compared to the sum of individual product/depositor-level balances.

ii. Expected stable portion of NMD balances :

While there is no single standardised approach to identify the portion of balances that are expected to be stable in the future, the methodologies are typically based on the components described below:

- Balance:
 - There is usually intra-month and intra-year variability of balances, notably due to seasonality effects.
 - Recently acquired balances are considered less stable. This can result from a recent surge in one specific product (e.g.: new product campaign, or flight to safety from other investment products)
- Customer relationship:
 - length of overall banking relationship, number of related products in the same customer relationship
 - Retention rate of customer over time
- Customer behaviour vis-à-vis the considered product:
 - parked funds where customer behaviour is not purely driven by financial outcomes)
 - product-specific tax incentives should be considered
 - average size of the account (e.g. a larger savings account balance is likely to be less stable than a smaller balance)
 - level of substitution with other deposits (e.g.: interest bearing and non-interest bearing deposits, impact of early withdrawal penalties on NMD alternatives) and with non-deposit alternatives to cash. This will vary between jurisdictions, but also develop over time as the competitor landscape and product offering change.
 - deposit guarantee scheme (the existence of deposit guarantee schemes might impact customer behaviours in a stressed environment)
- Operating environment:
 - Changing technology, demographics, competition, etc.
 - Wider economic environment considerations (e.g. whether the economy is growing or contracting may impact the size and growth pattern of customer balances; changes in tax environment)

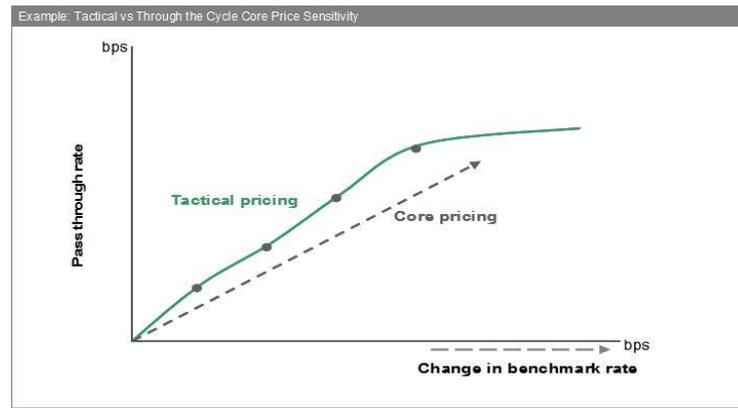
b. Customer rate component:

The responsiveness of customer rates to market rates, that is named ‘pass-through rate’ or ‘beta’, is a fundamental component of NMDs’ contributions to IRRBB.

As for balances, the analysis is based on numerous factors:

- There are several types of customer rates as they may be:
 - contractually set to a market rate
 - administered by the government
 - the result of competition, though in that case the bank retain a discretion in setting its customer rates (see below)
 - subject to regulation (e.g. some deposits may not be authorized to be earning interest)
- The change in customer rate is dependent on the direction, size and timing of the market rate changes:
 - there are operational lags between change in market rates and changes in customer rates;
 - the portion of the changes in customer rate is not necessarily proportional to the changes in market rates
- Customer rates may embed optionality, such as flooring as the customer rates usually cannot become negative. However, it should be noted that fees that are charged for NMDs can be modified and mitigate or complement the effect of changes in customer rates (typically, fees would increase in a low interest rate environment to mitigate the detrimental effect on earnings for the bank).
- For most products, the bank has a degree of discretion in setting its customer rate. In exercising its pricing discretion, the bank considers various factors:
 - Impact on the product balance (i.e. to which extent not passing an increase in market rate would lead to a decrease in balance?);
 - Consistency with the customer rates offered on other products, considering the potential for changes of balances (i.e. liability mix changes);
 - Comparisons with competitors’ changes in customer rates of similar products;
 - Its own IRRBB position: change in NMDs’ customers’ rates *is* part of the management of IRRBB.

Illustration of the bank discretion in setting its customer rates: the bank can depart from its own ‘core pricing’



c. Derived interest rate exposure from NMDs

The analyses of both balance component and customer rate component enable to derive the interest rate risk exposure from each NMD.

The table below gives a simple illustration of how the balance and customer components are combined to derived interest rate exposure:

Analysis of Balance Component	Analysis of Customer Rate Component		Derived Interest Rate Exposure to manage
	Correlation	Type of Market Rate	
Stable	Non Correlated Portion		Long Term
	Correlated portion	Long Term	Long Term
		Medium Term	Medium Term
Volatile	Short Term		Short Term

This usually leads to consider *each individual* NMD product class as a *unique* combination of short term, medium term and long term interest rate liabilities.

For each bank in each of the jurisdiction it operates in, the number of NMD product classes that need to be individually analysed, to derive a unique combination of rate exposures, varies from a few products to a dozen or more products.

The number of products in each jurisdiction is jurisdiction-specific and results from a number of factors:

- Type of products: demand deposit account, checking account, saving accounts, mortgage planning account, retirement account, money market accounts, custody account, cash management account, settlement account;
- Products characteristics in terms of availabilities: payment account, number of possible transactions, fees,

- Type of depositors: retail, wealth management, small and medium enterprise, corporate, financial institution;
- Type of pricing tiering: regions (eg: by state, county, town), balances
- Deposit currency
- Collateral requirement

Most often, banks apply a replicating portfolio approach by calibrating a (theoretical) rate (not cash-wise) investment strategy so that the rate delivered by this investment strategy enables to maintain an as stable as possible stable margin between the customer rate and the investment strategy rate. The investment strategy is a combination of short, medium and long term horizons.

Though the replicating portfolio is a theoretical tool to represent interest rate exposure of NMD, it is designed to be implementable through actual transactions. Hence, when in one jurisdiction there are limitations to instruments that are available to manage interest rate risk exposures, those limitations are factored in the design of the replicating portfolio. This applies to jurisdictions in which financial markets are less developed.

Concerns on a standardized approach on NMDs

We would be concerned should there be a supervisory desire to standardize NMD modelling by the prescription of a defined repricing term in IRRBB measurement. We are convinced that each NMD product needs to be considered with its unique characteristics and that there cannot be a unique standardized quantitative model.

Models for NMDs cannot follow a one-size-fits-all approach as they are highly dependent on both local regulations and local retail banking business models.

Therefore the firms should, under the umbrella of a robust and verifiable governance framework, be allowed to set their benchmark within which the management of IRRBB is performed.

We would be concerned if, as a result of the TFIR review, banks would be forced to shorten the overall duration of their balance sheets and/or cluster around the same investment horizon because their new conceptual framework is not flexible enough to incorporate behavioural aspects.

This would lead to more volatile earnings, impact on customer pricing, and in general could interfere with a normal process of price setting because banks are managing towards the same benchmark.

IV. EQUITY

The intent of this section is to present how equity is considered in IRRBB⁶.

⁶ This section describes some of the most common approaches, however it is not necessarily complete and exhaustive.

a. Specificities of equity: non-interest bearing liability with a prudential role

Equity is:

- A non-interest bearing funding source;
- A buffer to absorb unexpected losses when they occur;
- A residual claim that stockholders have on the proceeds from the assets after all the more senior liabilities are paid. In particular, this definition implies that both the EVE and NII of the equity should be identical to the sum of the EVE and NII of the assets and the liabilities.

Based on its role of funding source, cushion or residuals claim by the stockholders, several alternative perspective of equity may arise.

i. Going concern perspective:

Under a going concern perspective, equity is a stable non-interest bearing resource which contributes to bank's NII since it is invested in interest bearing assets.

In this perspective, to stabilize NII through the cycle and the long-term value of a EVE⁷, equity is invested in medium to long term fixed rate assets. Equity is then conventionally classified as a medium to long term fixed rate liability.

As equity is non-interest bearing liability, in a going concern perspective, there cannot be an interest rate loss in investing equity in fixed rate assets. At worst, there could be an opportunity cost, but always with positive NII from equity investment as change in interest rate may lead to lower earnings but not an earning loss (i.e. negative earning).

ii. Gone concern perspective:

Equity is considered as a buffer to be available to absorb unexpected losses. From this perspective, equity should be invested in free-risk assets as it shall be available to offset unexpected losses as if they were occurring immediately and for the entire amount of equity.

If equity is invested in fixed rate assets, in a gone concern perspective, there may be a risk of having to unwind the fixed rate investment of equity at a loss (if rates are higher than the rate of investment of equity)⁸, which would be detrimental to the loss absorbance capacity of equity.

iii. Equity as the residual claim by the bank stockholders

According to this view, the equity is the residual claim that stockholders have on the proceeds from the assets after all the more senior liabilities are paid. As no firm defaults as long as the proceeds from its asset are enough to cover for

⁷ In an environment with decreasing interest rates, a bank that invests equity in medium long term fixed rate assets is perceived as more resilient by external stakeholders (e.g. rating agencies), with a positive impact on funding cost

⁸ If equity is not invested in high quality assets, a loss could be however incurred due to credit risk

its liabilities, the role of equity as a buffer or cushion for losses follows from this definition.

This definition also determines the interest rate sensitivity that should be ascribed to the equity of a bank. A share in the ownership of the equity of a firm gives the owner a claim on the stream of all future earnings of the firm, in a proportion equal to the fraction that the share represents relative to the firm's total equity. These earnings may be paid as dividends or reinvested in new assets.

In the case of a bank, the main source of earnings is the net interest income, plus possibly fees minus operational and other non-interest costs. By definition, this income is the difference between interests accrued from the bank's assets minus the interest paid to the holders of the bank's liabilities.

Under this perspective the modelling is focused on the asset and the liabilities that constitute the balance sheet of the bank. This is true regardless one chooses focusing on NII and/or EVE as the relevant metrics in the context of managing the IRRBB.

b. Target duration of equity: explicit or assets driven

i. Explicit modelling of equity:

Explicit modelling of equity for IRRBB leads to consider equity as an amortizing fixed rate liability with a well-defined profile and duration. The conventional interest rate risk profile of equity is an input for IRRBB management.

This profile is typically derived from a replicating portfolio methodology similar to the one applied on NMD. It is approved by the ALCO and very seldom subject to variations. Then IRRBB is measured against this benchmark profile.

ii. Assets driven modelling of equity:

Assets driven modelling of equity for IRRBB leads to consider equity as a liability having a duration equal to the average duration of assets as equity is pro-quota invested in bank's assets. Then IRRBB is assessed as the interest rate exposure in excess of duration of assets.

The two above described methods could be applied to different IRRBB metrics: interest rate gaps, net interest income sensitivity or economic value.

c. Illustration of modelling of equity based on implied economic value sensitivity / duration of equity

This section illustrates an application of modelling of equity and IRRBB management.

In this approach, the economic value of equity is defined as the difference between the economic value of assets and the economic value of liabilities:

$$\text{EV (Equity)} = \text{EV (Assets)} - \text{EV (Liabilities)}$$

Then, the sensitivity of the economic value of equity is defined as:

$$\text{EV Sensitivity (Equity)} = \text{EV Sensitivity (Assets)} - \text{EV Sensitivity (Liabilities)}$$

Then, from the sensitivity of the economic value of equity, an implied duration of equity can be derived:

$$\text{EV Sensitivity (Equity)} \Rightarrow \text{Implied Duration of Equity}$$

This implied duration of equity can then be compared to a target duration, or a range of acceptable durations. As long as the implied duration of equity is within a range versus the target duration, the bank deems its IRRBB exposure as adequate. The range of acceptable implied duration of equity is usually decided in ALCO Committee which then monitors the consistency between range of acceptable duration and the actual implied duration (e.g.: an target 5y duration would considered consistent with an implied duration between 4 year and 6 years).

The current applicable Standardized Outlier Test (SOT) is very similar to this framework: as long as the sensitivity (to $\pm 200\text{bp}$ parallel shock) of economic value of the interest rate risk exposure is below a specific threshold (20% of Tier 1 + Tier 2), the interest rate risk position is deemed acceptable.

When the interest rate risk exposure is measured excluding modelling of equity, the SOT is exactly the sensitivity of the economic value of equity.

Concerns on a standardized approach

The decision on target duration of equity is made at the highest level of the organization to strike the balance between net interest income sensitivity (the net interest income is all the more stable as the chosen duration is higher) and the economic value sensitivity (the economic value is all the more insensitive to change in rates as the duration is shorter). Target duration is defined within the risk appetite framework for the overall banking book risk (credit, market, liquidity, interest rate etc...).

We are concerned that the regulators might not consider the IRR treatment that banks have developed in order to strike the balance between net interest income sensitivity and economic value sensitivity. It would lead to all banks behaving in exactly the same way in response to changes in market rate environment even when business model are different. This would foster procyclicality with increased systemic risk (e.g. all banks acting in the same way to mitigate the IRRBB risks as standardized by regulators). Moreover it would reduce the amount of fixed rate loans granted by banks increasing credit risk in an environment of rising interest rates.

We would therefore recommend that regulators pay great attention to the ramifications of any prudential framework that may be proposed.

V. RISK METRICS

For IRR management purposes, two broad categories of risk measurement approaches are being applied in the industry: earnings-based metrics and economic-value-based metrics.⁹ While earnings metrics are consistent with accounting framework and offer a direct view of the future earnings and the reality of the dynamics of the balance sheet earnings and potential detrimental impact on capital thus measuring the risk due to structural interest rate risk, they do have their shortcoming since they are limited to a few year horizons. In addition, over the very long term, earnings would derive only from future transactions and not existing transactions.

Economic value-based metrics are based on changes in present value derived from discounted future cash-flows of assets and liabilities on all horizons. Economic-value-based metrics have shortcomings: the present value analysis does not show periodic effects on banks' earnings. Only the cash flows from existing transactions (and their contractual-equivalent) are considered in economic value-based metrics.

Moreover, the time band mapping of cash flows in a static repriced gap inherently assumes that the full amount of all cash flows (regardless of underlying product type) within a specific time bucket will be repriced instantaneously and permanently by the overall shock being modelled, and that this will happen regardless of the direction of the shock. As economic-value based metrics do not consider future transactions, these metrics do not make it possible to measure structural interest rate risk. This typically leads to negative changes in economic value when rates are assumed to increase. This clearly highlights the *structural interest rate risk* dilemma: most often, economic (static) value-based metrics show that an increase in rates is detrimental to the bank, whereas earnings-based metrics show that an increase in rates is beneficial to the bank. It simply means that a bank cannot make both its NII and its economic value sensitivity insensitive to changes in rates.

It is not appropriate to consider one of the approaches or model types to be the solution for all banks. Banks do have good reasons to base their management decisions on a particular approach or model. Depending on the size, on the nature and the diversity of business models and activities, differences in banking systems across jurisdictions or on the maturity of portfolios, it may be wise to favor one of the two approaches or take the results of both into consideration at a particular bank which already is the case for large majority of banks.

We believe that EV is not a market value as no observable prices exist for BB exposures (with the exception of the liquidity portfolio). Therefore it is not a mark to market risk. Instead, EV is a discounted cash flow approach that is meant to capture longer term of the existing balance sheet items, ignoring the future new transactions (such as non- or low-interest bearing deposits that are the sources of structural interest rate risk). It is not a fair value or liquidation value but an estimate of the value of the static balance sheet i.e. it is a proxy for long-term static balance sheet earnings ignoring accounting convention and the timing of income statement recognition. Therefore EV and its sensitivity are useful to banks' and regulators but it is not directly related to a capital loss.

⁹ Please refer to IIF paper for full analysis of both risk metrics

VI. FOCUS ON ECONOMIC VALUE BASED EARLY WARNING INDICATOR

As mentioned above, we believe the principles for internal interest rate risk management, measurement and capital allocation should be strengthened in combination with early warning indicators, including an economic value based enhanced standardized outlier test (SOT).

The so called standardized outlier test (SOT), based on the economic value sensitivity to standardized parallel shifts in IRR curves, represents a simple static model and as such may be interpreted as an attempt to create a simple supervisory economic value based measure.

Its function is to serve as an *early warning system*, i.e. a thermometer that gives a signal to supervisory of an interest rate risk. We believe that the tool may serve this purpose well. We offer below some guiding principles in enhancing the SOT. However, considering its limitations (static metric, important role of assumptions, *variability risk*-oriented and not *loss risk*-oriented...), the SOT cannot be used for deriving a prudential capital charge.

The EBF would like to recommend the TFIR to enhance the current test taking into account the issues described below.

The current test is based on the assumption that interest rate positions are kept for 360 days. We believe that any model should be calibrated based on the assumption that it takes at a maximum 90 days to eliminate an interest rate risk position.

This period includes both (i) time to make a management decision and (ii) time to eliminate the risk position through the use of on-balance sheet and off-balance-sheet financial instruments.

The risk horizon would differ depending on each bank's portfolio and investment strategy and management delegations, but it is highly unlikely that it would take longer than 3-months.

If the cash-flow approach of the current model was to be kept, it should be taken into account that interest rate cash flows should only consider the rate component of cash-flows, excluding all other components being part of the external client margin since they are already designated to cover different risks (EL component), fixed costs and or yield of equity. There are 2 options of how to comply with this requirement. Mostly, larger and sophisticated institutions do have the technical capability to base the calculation on margin adjusted cash-flows. Many smaller institutions will not be able to do so. Alternatively, the risk-free swap curve used for discounting could be adjusted for the institutional client margin spread. In both cases, a neutral discounted cash-flow would be achieved. If there is not adjustment banks would be "penalised" for being able to charge larger margins in the market in order to make a profit.

Institutions use different approaches with varying complexity to take into account the effects of explicit and implicit options. Many more sophisticated institutions base their present value calculation on the basis of sensitivities, so-called delta and gamma equivalents. When this method is being applied institutions should be free to use them within an SOT.

As we have laid out in our chapter on NMDs we do not believe that it is possible to propose a meaningful supervisory standard which would capture the risks appropriately. We therefore recommend that institutions apply their own models in order to determinate the tenor and volume over time of their NMDs.
