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On hedge effectiveness assessment under IFRS 9

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Abstract

IFRS 9 has introduced certain radical changes to the hedge effectiveness assessment criteria of IAS 39 for entities desirous of availing hedge accounting. It is necessary for business entities contemplating the use of financial derivatives for hedging purposes to appreciate the nuances associated with the upstaged provisions of hedge accounting of IFRS 9 in context of hedge effectiveness requirements envisaged therein. The present article addresses this issue and provides a threadbare analysis of the fundamental model on which the IFRS 9 hedge effectiveness assessment is premised.

***Keywords**: IAS 39, IFRS 9, hedge accounting, hedge effectiveness, risk management.*

***JEl Classification**: M41; M42*

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Introduction

Phase wise pronouncement of a new International Financial Reporting Standard (IFRS hereinafter) entitled IFRS 9: Financial Instruments was made by the International Accounting Standards Board (IASB hereinafter) in three phases with the first phase being notified in November, 2009. Provisions on hedge accounting are contained in the third and final phase of IFRS 9 which was pronounced in November 2013. The extant directives of IASB on hedge accounting contained in International Accounting Standard (IAS hereinafter) 39 are proposed to be replaced by the provisions of IFRS 9. Entities following IFRS based accounting shall be mandatorily required to implement the provisions of IFRS 9 with effect from January 1, 2018 (IASB, 2008, 2012).

The philosophy underlying IFRS 9 is to rationalize the accounting provisions in relation to financial hedges in a manner to better reflect the nexus between the risk management strategies adopted by accounting entities and the accounting framework followed for the reporting of such practices. This would enable a precise depiction of the management's practices relating to the mitigation of risk by the reported financials. An overall simplification of the hedge accounting procedures and disclosures is also envisaged. Empirical studies point to difficulties in comprehending and applying the present accounting and reporting processes for derivatives (Chang et al, 2016).

Serious concern was voiced by stakeholders associated with the IFRS accounting framework about the lack of alignment between the provisions of IAS 39 and the risk management strategies of the hedging entities. For instance, many entities adopt hedging strategies in relation to forecasted purchase or sale of commodities or other non-financial assets that are aimed to hedge a particular constituent of the total price. However, IAS 39 based hedge accounting provisions require that the hedged risk be designated as the variability in total price. This causes the recognition of hedge ineffectiveness and may, in some instances, result in the hedge failing to qualify for hedge accounting altogether. It seemed that the accounting treatment prescribed for various risk management practices strongly influenced the choice of the practice. Ideally, the role of the accounting should be confined purely and solely to an unbiased reporting of the economic impact of the strategy pursued by the entity for risk mitigation and should be completely extraneous to the choice of the strategy. Stated otherwise, the financial reporting of a strategy should be based on its economic impact on the entity. The economic optimality of the strategy should not be impacted in any manner whatsoever by the accounting and reporting procedures in the given decision making scenario. However, it was observed by various interest groups that, in efforts to rope in hedge accounting under IAS 39, entities implemented sub-optimal risk management strategies or else, strategies perceived by the entities to be optimal failed to qualify for hedge accounting under IAS 39, causing reporting of non-existent enhanced, economically unjustifiable, earnings volatility (IFRS Foundation, 2013; Kalban, 2014; McCarroll and Khatri, 2014; Panaretou et al., 2013).

1. The backdrop: testing hedge effectiveness under IAS 39

Mandatory periodic testing of hedge effectiveness is prescribed for hedge accounting under IAS 39. In this context, hedge effectiveness is the extent to which fair value or cash flow variations of the hedging instrument are able to offset variations in the fair value or cash flows of the hedged item. This offsetting of the designated risk exposure by the derivative or the ability to do so needs to be established by the accounting entity through an appropriate methodology, statistical or otherwise, to be documented at the initiation stage. Importantly, the standard setters are conspicuously silent on the issue of prescribing specific methodologies for assessing hedge effectiveness. It is left to the entities and their auditors to determine the appropriate methodology and the corresponding inferences. Nevertheless, high hedge effectiveness needs, initially, to be established on a prospective basis. Thereafter, the fact that the hedge has been highly effective must also be testified retrospectively. Failure to qualify the effectiveness test would mandate discontinuance of hedge accounting. Such discontinuance shall commence from the latest date till which the hedge had been shown as effective. Fair value changes after such discontinuance are required to be taken to the income statement forthwith. If an event or a change in circumstances is responsible for precipitating the hedge ineffectiveness, discontinuance of hedge accounting shall commence from the timing of such event or change

in circumstances provided that the entity can establish effectiveness prior thereto. IAS 39 does not provide for rebalancing of a hedging relationship that has once become ineffective. Furthermore, the standard also does not allow for adjustments to the hedge not documented at the inception stage. The original relationship has to be discontinued in case of an ineffective hedge. A fresh hedging relationship is created on the rebalancing of a hedge that needs to be re-designated as such. Numerical tests are usually required to establish that the amount of offsetting achieved by the hedge is in the permitted range. This makes the process of effectiveness testing under IAS 39 extremely tedious and time consuming. If the hedge effectiveness tests fail to meet the prescribed criteria, the entity cannot adopt hedge accounting.

1.1. Methods of hedge effectiveness testing

Lack of specificity in the standards has led to the evolution of a variety of approaches for assessing hedge effectiveness, even though the basic requirement remains that gains or losses in derivatives should offset changes in fair values or cash flows of the hedged item. The issue of methodology surfaces at the point in time when it needs to be assessed whether a particular hedge is effective. A critical review of the following commonly adopted methods for effectiveness testing is consigned to the Appendix to retain the flow and continuity of this article viz. (a) Dollar Offset Method; (b) Relative Difference Method; (c) Variability Reduction Method and (d) Regression Analysis (Althoff and Finnerty, 2001; Kawaller and Koch, 2000).

1.2. Interpretation of "high effectiveness"

Neither IAS 39 nor IFRS 9 specify any bright line test for identifying highly effective hedging relationships from the ineffective ones. It, thus, follows that what is to be construed as "highly effective" is left to the judgment of the entity's risk managers subject to the audit requirements. However, the standard does seem to link "high effectiveness" to "high correlation" among the price processes of the hedged item and the hedging instrument. "High correlation" is generally interpreted as the 80/125 rule in medicine and other applied and social sciences. In the current context, this rule requires that the cumulative changes in the value of the hedging instrument should offset between 80% and 125% of the cumulative value changes in the fair value or the cash flows of the hedged item (Swad, 1995; Lipe, 1996).

1.3. Prospective and retrospective testing

IAS 39 requires hedge effectiveness testing on a prospective as well as a retrospective basis. Both such testing exercises need to be conducted with a quarterly periodicity or each time the financials are reported until the liquidation of the hedge. Retrospective testing should be on the basis of data that includes actuals since hedge inception, although other historical data may also be included. Retrospective assessment may be achieved on the basis of either (i) the changes in fair value or cash flow that occurred during the assessment period, or (ii) the cumulative changes in fair value or cash flow from the hedge's inception to date. The hedge achieves high effectiveness retrospectively if the ratio lies in the critical range in either of the two cases (Finnerty and Dwight, 2002). For prospective testing, the number of past periods' data to be considered needs to be decided. If data of only one prior period is used to calculate a test statistic, then the hedge either passes or fails the test. On the other hand, if the test statistics are calculated for more than one prior period, then effectiveness may be assessed either by requiring that (i) the hedge should satisfy the test in every period or (ii) the hedge must satisfy the test in a high proportion of the periods e.g. 80% or 90%.

2. The foreground: testing hedge effectiveness under IFRS 9

Several revolutionary changes have been introduced in the effectiveness testing philosophy and methodology by IFRS 9. These are, perhaps, the cardinal advancements over IAS 39 that would facilitate better alignment between the entity's risk management strategies and the financial reporting thereof. The significant changes to the effectiveness testing requirements introduced in IFRS 9 include (Althoff et al., 2014; BDO, 2014; Deloitte, 2013; Du Plooy et al., 2014; KPMG, 2013; PwC, 2013):

(a) The removal of the 80/125 percent offset requirement and replacement with a principles based effectiveness test;

(b) The removal of retrospective effectiveness testing requirement leaving only a prospective assessment to be done at the beginning of each hedged period; and

(c) Increased flexibility in how hedge effectiveness is demonstrated.

However, the need to measure and recognize hedge ineffectiveness is not altered under IFRS 9.

2.1. Assessment and measurement

The assessment of hedge effectiveness needs to be differentiated from its measurement. The assessment aspect ascertains the eligibility of the hedging relationship for hedge accounting. If the hedging relationship is found eligible for hedge accounting and if the entity chooses to adopt such accounting procedure, then the hedge ineffectiveness (except for a cash flow under-hedge) needs to be measured and recognized to the income statement forthwith. While the requirements of IAS 39 and IFRS 9 are significantly different with respect to the former, both require that hedge ineffectiveness be measured and dealt with identically.

2.2. Effectiveness criteria under IFRS 9

The effectiveness requirement under IFRS 9 comprises of the following: (i) there should be an underlying economic relationship between the hedged item and the hedging instrument that should be vindicated either by qualitative or quantitative means; (ii) credit risk should not be the dominant factor contributing to the value changes that result from the economic relationship; (iii) the hedge ratio calculated from the physical volume of hedged item that the entity actually hedges and that of the hedging instrument that the entity actually uses to hedge the said volume of the hedged item shall also be used for the hedging relationship in context of hedge accounting. However, that designated hedge ratio shall not reflect an imbalance between the weightings of the hedged item and the hedging instrument that would create hedge ineffectiveness (irrespective of whether recognized or not) that would be such that it could result in an accounting outcome that would be inconsistent with the purpose of hedge accounting. Thus, IFRS 9 does not prescribe any numerical range of effectiveness that needs to be met by the hedging relationship to achieve eligibility for hedge accounting. All that is required is the subsistence of an economic relationship, not dominated by credit risk, and the designation of the appropriate hedge ratio. It follows that if a hedging relationship persistently returns some ineffectiveness, the onus of establishing existence of continued economic relationship as well as the appropriateness of the hedge ratio would lie on the entity's management.

IFRS 9 has also introduced substantial modifications in the provisions underlying the treatment of ineffective hedges. Rebalancing of ineffective hedges is provided for in IFRS 9, thereby not requiring such hedges to be discontinued forthwith. Entities may discontinue ineffective hedges only when such rebalancing attempts fail. IFRS 9, however, retains the methodology of IAS 39 for measuring and dealing with hedge ineffectiveness (Deloitte, 2012; Ernst & Young, 2011, 2014a,b,c).

2.3. Existence of economic relationship

The existence of an "economic" relationship between the hedging instrument and the hedged item implies that the two must be expected to move in opposite directions as a consequence of a causal economic influence of the risk stimulus being hedged. A mere statistical correlation does not, of itself, provide conclusive evidence of the existence of such causal relationship although it would definitely corroborate evidence vindicating such an inference.

As in IAS 39, the standard setters have chosen to leave open the choice of methodology to be adopted by the entity for demonstrating the existence of economic relationship between the hedged item and the hedging instrument. The important point here is that the method should capture all the relevant characteristics of the hedging relationship. Among the quantitative approaches, correlation and regression analysis are immensely popular, although any of the other methods cited above may be adopted. Such quantitative results would serve as powerful corroborations to rationale and logical economic flows in cases where unambiguous inferences are not forthcoming on the basis of qualitative reasoning alone. It needs to be emphasized here that in a vast majority of hedging relationships, risk managers would, by default, use hedging instruments having some explicit "economic" relationship with the hedged item to hedge an exposure since such choice may result in an increased chance to meet hedge accounting criteria as well as enhance the prospects of the hedge achieving the desired economic results. An instance where a mere qualitative assessment would suffice is presented below:

Consider an entity that has foreign currency exposures in both US Dollars (USD) and Canadian Dollars (CAD). The entity observes that the CAD shows strong association with the USD as evidenced by the CAD/USD rate moving in an extremely narrow band over a sustained time frame. In view of this, the entity infers

that an economic relationship exists between USD linked derivatives (with the USD as the underlying) and CAD exposures. It, therefore, adopts the strategy of aggregating exposures in both these currencies and thereafter using USD linked derivatives for hedging. All variations of the CAD against the USD in the band are accounted for as a source of ineffectiveness for all hedges in which the hedged item relates to amounts denominated in CAD.

2.4. Non-domination of credit risk

As the second requirement for hedge effectiveness, IFRS 9 mandates that the effect of credit risk should not dominate the value changes that result from the economic relationship between the hedged item and the hedging instrument. The credit risk referred to herein would include the credit risk on the hedged item as well as the hedging instrument. Further, credit risk could relate to that of the counterparty or the hedging entity itself. The issue of credit risk and financial stability in context of IFRS 9 has been conceptually examined (Novotny-Farcas, 2016).

2.4.1. Interpretation of "Dominate"

Due exercise of judgment and discretion is warranted by the entity's management on two counts. Firstly, in ascertaining the impact of (quantifying) the value changes due to the credit risk and thereafter in assessing whether such impact "dominates" the value changes due to the hedged risk or otherwise. For this purpose, "dominate" in context of the current provision would mean that the price changes (of the hedged item or the hedging instrument) due to the credit risk would significantly exceed the price changes due to the hedged risk factor.

It is pertinent here to emphasize that the assessment of the impact of credit risk on value changes for the purposes of hedge effectiveness needs to be differentiated from the accounting prescription to measure and recognize the impact of credit risk on the hedged item and the hedging instrument. This is required to ascertain the quantum of hedge ineffectiveness, if any, to be carried to the income statement.

However, the standard does explicitly provide for the ignoring of small changes in spite of such changes being due to credit risk and exceeding the changes due to the hedged risk in a particular period. Thus, the standard provides for both, a relative and an absolute assessment.

More likely than not, the assessment of the effect of credit risk would be qualitatively achieved. It is usual for the risk management policies of entities to define counterparty risk limits ab initio. Regular monitoring of the credit standing of these counterparties would, then, be prescribed. In the event of a significant decline in creditworthiness, the policy may provide for initiation of appropriate corrective measures e.g. of closing out derivative positions with this party and novating it to another party (in which case, the hedging relationship would need to be discontinued), or calling for collateral or other credit enhancements (which would significantly improve the hedging relationship). Occasionally, however, regression or other statistical methods may be adopted e.g. for identifying factors that are contributing to a low offset in a particular relationship and to assess the magnitude of their influence.

2.4.2. Hedged item credit risk

Credit risk does not exist for all types of hedged items. Current assets like inventories etc. are devoid of credit risk. Even forecast transactions do not carry credit risk since the transactions are only anticipated but not committed. Credit risk may be construed as the risk of a financial loss to a party to a financial commitment / instrument in the event of the other party failing to discharge its obligation. It follows that credit risk can only subsist in situations where the entity has a contractual involvement. Thus, the entity's lendings would normally have counterparty credit risk, while its financial borrowings and liabilities would bear the entity's own credit risk.

It is mentioned above that forecast transactions do not carry any credit risk. Nevertheless, the credit risk affecting the counterparties involved could significantly influence the assessment of whether a forecast transaction is highly probable, as is required under other provisions of IFRS 9. A very simple example illustrates the point. Consider a US entity selling a product to only one customer in Germany. The sales are denominated in Euros. The US entity does not have alternative customers for the product in Germany. In this situation, the credit risk of the German customer would definitely influence the probability of the US entity's forecast sales

in Euros. The converse may also hold i.e. if the US entity has a wide German customer base for its product sales (in Euros), the potential loss of a particular customer may not significantly affect the probability of the entity's forecast sales in Euros.

It seems opportune to illustrate here, the process usually adopted by banks for identifying the appropriate economic hedges for hedging of interest rate risk of their lending portfolios. For this purpose, we consider a bank desirous of hedging the interest rate risk of a portfolio of loans possessing similar credit risk characteristics. We, further, assume that the bank expects to collect 98% of the cash flows in this loan portfolio. Accordingly, the bank designates the first 98% of the cash flows only since the hedging should be confined to the cash flows the entity expects to collect. In fact, if the bank designates more than 98%, an economic over-hedge would result which would also increase the risk of credit risk dominating the value changes of the hedging relationship.

In contrast to IAS 39 that prohibited such designation of nominal components (usually referred to as the bottom layer), IFRS 9 allows such designation subject to the condition that all items included in the layer are exposed to the same hedged risk. This is necessary to ensure that the measurement of the hedged layer is not significantly affected by items that constitute the 98% layer from the overall 100% of the portfolio. It follows that the same kind of benchmark interest rate risk component of each loan has to be designated to make up the bottom layer. If the economic relationship of a particular loan with the benchmark interest rate gets dominated by the credit risk of such loan due to deterioration in its credit standing, so that its benchmark interest rate risk component no longer qualifies to be designated as a hedged item, then the loan will no longer be a part of the bottom layer until and unless loans with such a deterioration in credit risk exceed 2% of the portfolio.

2.4.3. Hedging instrument credit risk

The fair value of an account must necessarily reflect and incorporate the impact of counterparty's credit risk and the entity's own credit risk in accordance with the measurement scheme envisaged by IFRS 13: Fair Value Measurement. Changes in value of the hedging instrument due to the credit risk are likely to contribute to hedge ineffectiveness. Thus, the current provision requires that the expected impact of that ineffectiveness should not be substantial enough to nullify the offsetting effect of a significant change in the values of the hedged item by the hedging instrument.

Most over-the-counter derivative contracts between financial institutions are cash collateralized and, as a consequence, carry little credit risk for either party. Exchange traded contracts also have well developed settlement mechanisms in place to eliminate any credit risk. It follows that credit risk is unlikely to dominate the change in fair value of such hedging instruments.

2.5. The issue of "hedge ratio"

The ratio of the amount of hedged item and the amount of hedging instrument is termed as the hedge ratio. Usually, but not necessarily, it is the ratio that corresponds to minimum projected variance of the hedging relationship and depends on the correlation between the projected time series of price changes of the hedged item and that of the hedging instrument as well as the variances of the two series. In cases where the underlying of the hedging instrument coincides with the designated hedged risk, this ratio is 1:1.

The third effectiveness requirement is that the hedge ratio used for accounting should be the same as that used for risk management purposes. However, this does not imply that an entity must designate hedging relationships to the same extent as it hedges for risk management purposes. To illustrate, consider an entity that hedges 100 units of a commodity with a hedge ratio of 1.25 for risk management. It would, thus, require a notional amount of 125 units of the hedging instrument for the purpose of full hedging. The standard, then, (i) requires that the same hedge ratio (i.e. 1.25) be adopted in accounting for the hedge (ii) but leaves it open to the entity to designate the full 100 units of the commodity (hedged item) or less (e.g. 80 units of the commodity with a notional amount of 100 units of the hedging instrument) in the hedging relationship, while maintaining the same hedge ratio of 1.25. Furthermore, it needs to be emphasized here that the standard (i) requires only that the entity uses the same hedge ratio for accounting that it actually uses for risk management purposes; (ii) but does not require that the hedge ratio be such as to minimize ineffectiveness. Besides, in line with the spirit underlying these standards, IFRS 9 is silent on the use of any specific method for calculating

the hedge ratio. It follows by implication that the standard acknowledges the existence of no 'right' answer to this issue and, as such, feels that the matter be best left to the entity's management and the auditors. Furthermore, the fluctuation of the actual discount around any designated hedge ratio will give rise to some ineffectiveness.

To illustrate the computational nuances of the hedge ratio, we consider an entity that desires to hedge the price risk in relation to its raw material purchase requirements. The entity finds that derivatives on the raw material do not trade in accessible markets. It identifies a benchmark commodity with a well entrenched derivatives market. Although the price of the raw material is at a discount to the benchmark commodity's price, their ratio varies in a narrow band. A rolling 12-month regression at each month end is run between the commodity benchmark price and raw material price. This regression show that commodity futures price and the raw material price remain highly correlated and the regression slope varies between 1.084 and 1.122 over the recent months. This regression slope indicates that, on average, the commodity trades at about 10% premium to the raw material price which is consistent with the entity's long term perception. Therefore, to hedge its raw material price risk, the entity takes a long position in a notional amount of 1 tonne of futures on the benchmark commodity to hedge highly probable forecast purchases of 1.10 tonnes of the raw material.

Two points emanate from an analysis of the above illustration viz. (i) the hedge ratio being used by the entity need not necessarily be the one obtained from the most recent monthly regression, the standard requires only that the hedge ratio actually used for risk management purposes be also used for hedge accounting, not necessarily the one that minimizes effectiveness and (ii) that various entities may come up with different hedge ratios due to running different regression analyses (e.g., in terms of frequency and data inputs).

In an effort to deal with cases of deliberate under-hedging with the objective of either reducing the (i) creation of additional fair value adjustments to the hedged item in fair value hedges or (ii) recognition of ineffectiveness in cash flow hedges, the IASB has listed an exception to the general rule of identical hedge ratio for risk management and accounting purposes by providing that the "hedge ratio for accounting purposes be different from the hedge ratio used for risk management if the hedge ratio reflects an imbalance that would create hedge ineffectiveness that could result in an accounting outcome that would be inconsistent with the purpose of hedge accounting." The important point here is that under-hedging must be "deliberate" in order that this provision be invoked.

To illustrate the case of under-hedging in context of a cash flow hedge, we consider an entity that has a highly probable forecast purchases of a raw material of the average value of CXP 100 million per month. Desirous of hedging its raw material price risk, the entity looks for appropriate derivatives but finds that derivatives on the raw material are not traded. Futures with the closest underlying match have a slope in a linear regression analysis of 0.90, which indicates the appropriate hedge ratio. In an attempt to avoid recognition of accounting ineffectiveness, the entity longs futures with a notional amount of only CXP 70 million per month. It sets up cash flow hedges by designating the CXP 70 million of futures as hedging instruments of highly probable forecast purchases of CXP 100 million, using a hedge ratio of 0.7:1.

The above facts may invite the above under-hedging provision and the hedge ratio would be considered unbalanced and entered into only to avoid recognition of accounting ineffectiveness. Accordingly, the above actual hedge ratio may be superseded by the hedge ratio based on the expected sensitivity between the hedged item and the hedging instrument e.g. 0.90 based on regression analysis, for the purposes of hedge accounting.

As in IAS 39, it is mandated under IFRS 9 that the cash flow hedge reserve is to be adjusted for the lower of (a) the cumulative gain or loss on the hedging instrument or (b) the cumulative change in fair value of the hedged item. If (a) exceeds (b), the difference is recognized in profit or loss as ineffectiveness. On the other hand, no ineffectiveness is recognized if (b) exceeds (a).

Thus, in the above illustration, if the relative change in the fair value of the hedging instrument exceeds that of the hedged item due to the change in the relationship between the underlyings, recognition of some ineffectiveness will have to be accorded.

A "perfect hedge" is not envisaged by the standard. For instance, if the imbalance emanates due to the hedging instrument being available only in standardized contract

sizes and it thereby becomes impracticable to exactly meet its nominal quantity requirement, leading to some under-hedging, the hedging relationship would not be regarded as resulting in an outcome 'that would be inconsistent with the purpose of hedge accounting' and so would meet the qualifying criteria.

2.6. Prospective hedge effectiveness under IFRS 9

IFRS 9 has done away with the retrospective testing of hedge effectiveness and retained only the prospective testing. It, therefore, requires the entity to establish that the hedging relationship meets the three pronged criteria of hedge effectiveness at inception of the hedge and at each reporting date thereafter, in relation to the immediately following reporting period.

2.7. Fair value and cash flow hedges under IFRS 9

Using the 80/125 bright line for IAS 39, we provide a comparison of the provisions of IAS 39 and IFRS 9 with regard to the percentage change in fair value (FV) of hedging instrument recognized in income. In the absence of hedge accounting, 100 per cent of the change in fair value of the hedging instrument is recognized in the income statement with no offsetting amounts from re-measuring of hedged item (in the case of a fair value hedge). This procedure holds under IAS 39 as well as IFRS 9.

2.7.1. Fair value hedges

In the following, we assume that the Y coordinate represents percent changes in fair value (FV) of hedging instrument recognized in income net of any fair value hedge adjustments on hedged items in a fair value hedge and the X coordinate represents (in percent) the negative ratio of the fair value changes of the hedged item and the hedging instrument i.e. $-\frac{\Delta FV\left(hedged\ \ item\right)}{\Delta FV\left(hedging\ \ instrument\right)}$. Then, under IAS 39, we have $Y=\begin{cases}100\ \ for\ \ -\infty<X<80\\ -X+100\ \ for\ 80\le X\le 125\\ 100\ \ for\ 125<X<\infty\end{cases}$ while IFRS 9 provides that, if the hedge is assessed as highly effective on the basis of the three pronged criteria: $Y=-X+100$ without any numerical bright line limits.

2.7.2. Cash flow hedges

IAS 39 defines a cash flow hedge by the following equation: $Y=\begin{cases}100\ \ for\ \ -\infty<X<80\\ -X+100\ \ for\ 80\le X\le 100\\ 0\ \ for\ 100<X\le 125\\ 100\ \ for\ 125<X<\infty\end{cases}$.

When a cash flow hedge is assessed as effective, IFRS 9 provides that $Y=\begin{cases}-X+100\ \ for\ 0\le X\le 100\\ 0\ \ for\ 100<X\end{cases}$.

In circumstances, where the amounts deferred in reserves is the lower of (i) the cumulative gain or loss on the hedging instrument from inception of the hedge; and (ii) the cumulative change in present value of the expected future cash flows on the hedged item from inception of the hedge, both IAS 39 and IFRS 9 provide identical treatment of cash flow hedges. No ineffectiveness is carried to income for an effective cash flow hedge in circumstances where the cumulative change in value of the hedging instrument is less than that of the hedged item. Deliberate under-hedging in the case of cash flow hedges is not permitted under either standard.

2.8. Matched and mismatched hedging instruments

2.8.1. Matched hedging instruments

In cases where the critical terms of the hedged item and hedging instrument match and the hedging instrument has zero fair value at inception of the hedge, the existence of an economic relationship would prime facie stand established besides supporting a 1:1 hedge ratio. However, if hedge ineffectiveness arises, an analysis of the sources therefor, such as credit risk, would need to be carried out. In most cases, a qualitative evaluation would suffice.

2.8.2. Closely matched hedging instruments

If the critical terms of the accounts in the hedging relationship are closely but not fully matched, a

qualitative assessment of compliance with the hedge effectiveness conditions may need to be corroborated by some quantitative or statistical inferences. Whether such quantitative backing is actually required is a matter of judgment. Quantitative analysis may prove immensely valuable in demonstrating that the critical terms mismatch does not negate the underlying economic relationship as well as providing strong justification for the hedge ratio used. Analysis that identifies the potential causes of hedge ineffectiveness should be documented.

2.8.3. Significantly mismatched hedging instruments

If there is significant mismatch of the critical terms of the hedged item and hedging instrument but underlyings of each are the same or related, a mere qualitative justification of economic relationship may not suffice and a comprehensive quantitative analysis on the same lines as required under IAS 39 would be necessary to authenticate the existence of economic relationship and compliance with the hedge ratio requirements. However, compliance with the bright line 80/125 offset requirement is not mandatory, and a lesser offset level may also provide sufficient justification, if adequately explained. This issue requires exercise of judgment and discretion by the entity's management. Analysis that captures the potential causes of hedge ineffectiveness, such as credit risk and basis risk, should be documented.

2.9. Effectiveness testing of aggregated exposures

For effectiveness testing of hedges in relation to aggregated exposures, it is necessary to consider the outcomes emanating from the aggregate of the constituents of such exposure. The hedged item and the hedging instrument may not be perfectly matched at the individual level e.g. basis risk may exist. Any ineffectiveness at the first level gets carried to the second level. Compliance of effectiveness criteria at the first-level relationship is not mandated under IFRS 9 for hedge accounting in the case of an aggregated exposure. Nevertheless, it becomes a much more complex situation if the first level relationship does not exist.

Nevertheless, the accounting for the constituents of the aggregated exposure is to be done separately by adopting the normal requirements of hedge accounting. Thus, the aggregated exposure is not to be treated as a 'synthetic' single item for accounting purposes. It is only in assessing the effectiveness and measuring the ineffectiveness that the combined effect of the items in the aggregated exposure needs to be considered.

Aggregated exposures generally assume relevance in context of hedging of purchase or sales of goods or commodities. Entities may need and decide to hedge for several risk exposures in such situations, although each risk may not be hedged for the same time period. An illustration explains the hedging implications of IFRS 9 and its predecessor in relation to aggregated exposures. For this purpose, we consider an entity (ABC) that manufactures aluminum tubings for which it plans to import raw material as aluminum pellets from the United States (US) for the next six months. The aluminum price is denominated in US Dollars (USD). As such, ABC is exposed to the aluminum price risk as well as foreign exchange risk. Thus firm initially hedges the aluminum price risk through aluminum futures contracts, thereby ensuring a fixed USD price for its requirements of aluminum raw material. After two months, the firm decides to cover its exchange risk as well through a forward purchase of a fixed amount of USDs. Thus, ABC has, now, hedged its aggregated exposure comprising of the original exposure to aluminum price (in USD) fluctuations and the foreign exchange exposure to the USD, arising from the aluminum futures contract.

Since derivatives are precluded from being designated as part of a hedged item under IAS 39 for accounting purposes, ABC could either (i) terminate the first hedging relationship viz. the aluminum price (in USD) hedge with aluminum futures and re-designate a fresh hedging relationship comprising of the joint designation of the aluminum price (in USD) hedge with aluminum futures together with USD exchange risk hedge with USD forward or (ii) continue the aluminum price (in USD) hedge and designate the USD forward in a second hedging relationship to hedge the USD exchange risk. In the former case, some ineffectiveness could emanate due to the aluminum futures contract not having a zero fair value on designation of the new relationship while the latter course of action would result in a constant change in the volume of the hedged item (USD) of the second hedge as the aluminum futures (in USD) are hedged for foreign exchange risk. This will, again, adversely affect the hedge effectiveness.

However, under IFRS 9 aggregated exposures that comprise of an exposure that could qualify as a hedged item and a derivative are allowed to be designated as a hedged items. As such, ABC could designate the foreign exchange forward in a cash flow hedge of the aggregated exposure comprising of the aluminum price (in USD) risk and the aluminum futures contract without affecting the first hedging relationship. Thus, the discontinuance and re-designation of the first hedging relationship is done away with.

Summary and conclusions

The feedback from stakeholders to IFRS 9, once it gets completely operational, will be immensely educative. The standard has several novelties with far reaching implications. Till such time that this information is received and dissected, we need to make the most of the reactions to the Exposure Draft (ED 2010/13) preceding the pronouncements of IFRS 9 on the issue of hedge effectiveness. An analysis of the cardinal viewpoints made by various stakeholder groups viz. preparers, auditors, users, regulators and consulting groups make very interesting reading. The views clearly reflect the vantage points of the particular interest group. Users were vociferous in opposing the apparent shift from a well-defined "bright line" to relatively subjective criteria for assessing hedge effectiveness. It was felt that an open ended effectiveness criterion would impair the comparability of the effectiveness of risk management strategies across firms and across different time periods, particularly if the effectiveness related disclosures were not adequate. Technically, while the subjectivity of the hedge effectiveness criteria may reduce the number of effective economic hedges that would not be hedge accounting compliant, it would increase the number of ineffective hedges that may meet compliance. In the latter situation, a cash flow hedge could cause an inappropriate deferral of derivative gains and losses.

Auditors and preparers, on the other hand, welcomed this transition to a qualitative assessment, in general. The overwhelming sentiment was that the ensuing simplification of accounting and reporting processes would make hedge accounting significantly more economical to implement. Notwithstanding this, the need for additional guidance (and/or examples) from the regulators on (i) situations in which a qualitative assessment of effectiveness would be adequate and (ii) criteria to determine when augmenting such qualitative assessment by corroborating quantitative evidence would be necessary to establish hedge effectiveness, was also strongly voiced. The need for clear demarcation was precipitated by a general feeling among preparers that auditors may insist on quantitative support by way of abundant caution, even in situations where the spirit of the standards seemed to allow qualitative assessments. Auditors would interpret the new criteria to their perceived level of rigor. This could lead to erosion of the benefits to the preparers of the envisaged simplification by way of permitting qualitative assessments on a standalone basis. Furthermore, the absence of such guidance could also lend itself to possible interpretation of a higher threshold than the existing 80/125 requirement e.g. of a 100% effectiveness requirement. Similarly, the requirement to minimize ineffectiveness may be construed as prescribing the use of only perfect derivatives rather than the most economical derivatives which meet the risk management objectives.

Some comment letters desired the standard setters to provide clear guidance on the criteria that needs to be fulfilled for the inference of the existence of an economic relationship together with further elaboration of the factors to be considered in determining whether there is an adequate economic relationship.

To summarize, IFRS 9 does enable easing of several hedge effectiveness requirements although a few areas still require refinement. While IAS 39 allows hedge accounting only on the prospective and retrospective satisfaction of the effectiveness test, IFRS 9 dispenses with the latter and only a prospective effectiveness test will be required with effectiveness close to 100%. IAS 39 requires discontinuance of hedge accounting on failure of the effectiveness test, although, in the event of rebalancing, the rebalanced hedge may be re-designated as a fresh hedging relationship. IFRS 9 allows for the continuance of hedge accounting on such rebalancing, and if such rebalancing also fails, then hedge accounting needs to be discontinued. Nevertheless, the hedge effectiveness testing process continues to be inherently arduous requiring acquaintance with and application of complex statistical techniques and valuation models. At a macro level, studies of the taxonomical aspects of IFRS 9 have also spelt out some issues that need redressal.

IASB pronouncements generally focus on industry non-specific financial reporting targeted to provide useful information to investor groups. There could, therefore, be situations in which these standards could be at variance with the recommendations of supervisory bodies overseeing specific industries (Beerbaum and Piechocki, 2017). Efforts should be made to ensure maximal harmonization with optimal level of disclosures.

REFERENCES

1. Althoff, J.M. and Finnerty, J.D. (2001), *Testing hedge effectiveness*, FAS 133 and the New derivatives accounting landscape, Institutional Investor, New York, Fall 2001, pp. 44 - 51.
2. Althoff, J., Halterman, S. and Lee Y.-B. (2014), *PwC. Accounting for hedging activities. IASB new general hedge accounting requirements*, Available online at: http://www.pwc.com/en_US/us/cfodirect/assets/pdf/dataline/dataline-2014-03-accounting-for-hedging-activities.pdf, Accessed on October 25, 2016.
3. BDO (2014), *Need to know. Hedge accounting,* Available online at: http://www.bdointernational.com/Services/Audit/IFRS/, Accessed on October 25, 2016.
4. Beerbaum, D. and Piechocki, M. (2017), IFRS 9 for financial institutions – the case for IFRS and FinRep-taxonomies – a conceptual gap analysis, *Journal of Accounting, Auditing and Finance*, DOI: 10.2139/ssrn.2857939.
5. Canabarro, E. (1999), *A note on the assessment of hedge effectiveness using the dollar offset ratio under FAS 133*, Research Report, Goldman Sachs and Co., New York, June 1999.
6. Chang, H.S., Donohoe, M. and Sougiannis, T. (2016), *Do analysts understand the economic and reporting complexities of derivatives?*, Journal of Accounting and Economics, vol. 61, no. 2-3, pp. 584–604, DOI 10.1016/j.jacceco.2015.07.005.
7. Deloitte (2012), *A closer look. Assessing hedge effectiveness under IFRS 9,* available online at: http://www.denetimnet.net/UserFiles/Documents/A%20Closer%20Look%203.pdf, accessed on October 25, 2016.
8. Deloitte (2013), *Need to know – Hedge accounting reforms: A closer reflection of risk management*, available online at: http://www.deloitte.com/assets/Dcom-UnitedKingdom/Local%20Assets/Documents/Services/Audit/Accounting%20and%20Payroll%20Solutions/uk-audit-hedge-accounting-reforms.pdf, accessed on October 25, 2016.
9. Du Plooy, C., De Vries, K.-J. and Fromont, A. (2014), IFRS 9 hedging. Was it worth the wait?, *TMI Treasury Management International*, vol. 222, pp. 33-36.
10. Ederington, L.H. (1979), The hedging performance of the new futures markets, *Journal of Finance*, Vol. 34, no. 1, pp. 157-170.
11. Ernst & Young (2011), *Hedge accounting under IFRS 9 – a closer look at the changes and challenges*, available online at: http://www.ey.com/Publication/vwLUAssets/Hedge_accounting_under_IFRS_9_a_closer_look_at_the_changes_and_challenges/$FILE/Hedge_accounting_under_IFRS_9_GL_IFRS.pdf, accessed on October 25, 2016.
12. Ernst & Young (2014a), *Hedge accounting under IFRS 9,* Available online at: http://www.ey.com/Publication/vwLUAssets/Applying_IFRS:_Hedge_accounting_under_IFRS_9/$File/Applying_Hedging_Feb2014.pdf, Accessed on October 25, 2016.
13. Ernst & Young (2014b). *IASB sets 2018 effective date for IFRS 9, FASB scales back scope of its insurance project*, Available online at: http://www.ey.com/Publication/vwLUAssets/Insurance-Accounting-Alert/$File/EY-IASB-sets-2018-effective-date-for-IFRS-9-FASB-scales-back-scope-of-its-insurance-project.pdf, Accessed on October 25, 2016.
14. Ernst & Young (2014c), *International GAAP 2014*, Hoboken.
15. Finnerty, J.D. and Grant, D. (2002), Alternative Approaches to Testing Hedge Effectiveness under

SFAS No 133, *Accounting Horizons*, vol. 6, no. 2, pp. 95-108, DOI 10.2308/acch.2002.16.2.95.

16. Franckle, C.T. (1980), The hedging performance of the new futures markets: comment, *Journal of Finance*, vol. 35, no. 5, pp. 1273-1279, DOI 10.1111/j.1540-6261.1980.tb02211.x.
17. IASB (International Accounting Standards Board) (2008), *Discussion Paper Reducing Complexity in Reporting Financial Instruments*, available online at: http://www.ifrs.org/Current-Projects/IASB-Projects/Financial-Instruments-A-Replacement-of-IAS-39-Financial-Instruments-Recognitio/Discussion-Paper-and-Comment-Letters/Documents/DPReducingComplexity_ReportingFinancialInstruments.pdf, accessed on October 25, 2016.
18. IASB (International Accounting Standards Board) (2012), *Hedge accounting general questions*, available online at: http://www.ifrs.org, accessed on October 25, 2016.
19. IFRS Foundation (2013), *IFRS 9 Financial Instruments (Hedge Accounting and amendments to IFRS 9, IFRS 7 and IAS 39)*, available online at: http://www.ifrs.org/Current-Projects/IASB-Projects/Financial-Instruments-A-Replacement-of-IAS-39-Financial-Instruments-Recognitio/Phase-III-Hedge-accounting/Documents/IFRS-9-FI-Project-Summary-November-2013.pdf, accessed on October 25, 2016.
20. Kalotay, A. and Abreo, L. (2001), Testing hedge effectiveness for FAS 133: the volatility reduction measure, *Journal of Applied Corporate Finance*, vol. 13, no. 4, Winter 2001, pp. 93-99, DOI 10.1111/j.1745-6622.2001.tb00429.x.
21. Kawaller, I.G. and Koch, P.D. (2000), Meeting the 'Highly Effective Expectation' Criterion for Hedge Accounting, *Journal of Derivatives*, vol. 7, no. 4, pp. 79-87, 10.3905/jod.2000.319136.
22. KPMG (2013), *First impressions: IFRS 9 (2013) – hedge accounting and transition*, available online at: http://www.kpmg.com/CN/en/IssuesAndInsights/ArticlesPublications/Newsletters/First-Impressions/Documents/First-Impressions-O-1312-IFRS9-Hedge-accounting-and-transition.pdf, accessed on October 25, 2016.
23. Lipe, R.C. (1996), *Current accounting projects*, Presentation at the 1996 Twenty-Fourth Annual National Conference on Current SEC Developments, Office of the Chief Accountant, U.S. Securities and Exchange Commission.
24. McCarroll, J. and Khatri, G.R. (2014), Aligning hedge accounting with risk management, *Financial Reporting – Accountancy Ireland*, vol. 46, no. 2S, April 2014, pp. 36-38.
25. Panaretou, A., Shackleton, M. and Taylor, P.A. (2013), Corporate risk management and hedge accounting, *Contemporary Accounting Research*, Spring 2013, vol. 30, no. 1, pp. 116-139, DOI: 10.1111/j.1911-3846.2011.01143.x.
26. PwC (2013), *Practical guide. General hedge accounting*, available online at: http://www.pwc.com.au/assurance/ifrs/assets/Practical-Guide-General-Hedge-Accounting-Mar14.pdf, accessed on October 25, 2016.
27. Royall, R.L. (2001), Use of regression in assessing hedge effectiveness. FAS 133 and the new derivatives accounting landscape, *Institutional Investor*, New York, Fall 2001, pp. 52–61.
28. Swad, S.M. (1995), *Accounting and disclosures for derivatives*, Presentation at the 1995 Twenty Second Annual National Conference on Current SEC Developments, Office of the Chief Accountant, US Securities and Exchange Commission.
29. Novotny-Farkas, Z. (2016), The interaction of the IFRS 9 expected loss approach with supervisory rules and implications for financial stability, *Accounting in Europe*, vol. 13, no. 2, pp 197-227, DOI 10.1080/17449480.2016.1210180.

Appendix

Popular Quantitative Methods of Assessing Hedge Effectiveness

(Ederington, 1979; Finnerty and Grant, 2002; Franckle, 1980)

(A) The Dollar Offset Method

This method computes the negative ratio of the cumulative changes in the fair value or cash flow of the hedging instrument and the hedged item from a particular date. The ratio can be computed on a period by period basis or cumulatively. Thus, the Dollar Offset Ratio (DOR) is given by

$DOR = -\left(\sum_{i=1}^{n} X_i \Big/ \sum_{i=1}^{n} Y_i\right)$ where $\sum_{i=1}^{n} X_i$ is the cumulative sum of the periodic changes in the value of the hedging instrument and $\sum_{i=1}^{n} Y_i$ is the cumulative sum of the periodic changes in the value of the hedged item from the chosen date. The negative sign is retained since the numerator and denominator would invariably carry opposite signs in the context of a hedging relationship, so that the DOR will return a positive value. In the case of a perfect hedge, $DOR = 1$ since the changes in the value of the hedging instrument exactly offset the changes in value of the hedged item.

The 80/125 bright line rule for high hedge effectiveness under IAS 39 is articulated with respect to the Dollar Offset Method, so that this rule requires that the hedging instrument's change in fair value or cash flow should offset at least 80% and not exceeding 125% of the fair value changes or cash flows of the hedged item i.e. we must have $0.80 \le -\left(\sum_{i=1}^{n} X_i \Big/ \sum_{i=1}^{n} Y_i\right) \le 1.25$.

"High effectiveness" is linked to "High correlation" which is generally interpreted as the 80/125 rule in medicine and other applied and social sciences. The articulation of this rule as representing "high correlation" in relation to SFAS 80, informally, is attributed to the speech of a member of the SEC's Office of the Chief Accountant at the SEC's 1995 Annual Accounting Conference (Swad, 1995; Lipe, 1996), whence its adoption in SFAS 133 followed and spilled over to IAS 39.

A major shortcoming of this method is its sensitiveness to small changes in the value of the hedging instrument or the hedged item (Canabarro, 1999). To illustrate, we consider a hedged item whose initial value is $1.00 million. If its value changes by $ 50 and that of the hedging instrument (derivative) changes by $ 100, the DOR works out to 2.00 or 200% which is well beyond the 80/125 bright line. Since the price changes here are negligible, disallowance of hedge accounting would not make a significant impact to the financials of the entity in this period. However, if a large price change occurs in the next period and hedge accounting continues to be denied, then the financial impact could be massive. Due to the extreme sensitivity of this method to price changes, hedges that are performing very well can quickly get out of favor and be denied hedge accounting.

(B) Relative Difference Method

As mentioned above, a massive shortcoming of the Dollar Offset Method is that the DOR is extremely sensitive to small changes in the value of the hedging instrument or the hedged item. An improvement to eliminate this flaw is to use percentage changes in lieu of absolute changes. This method is called the Relative Difference Method and defines the effectiveness test statistic as: $RD_n = \dfrac{\sum_{i=1}^{n} X_i + \sum_{i=1}^{n} Y_i}{V_0}$ where V_0 is the initial value of the hedged item and $\sum_{i=1}^{n} X_i$ and $\sum_{i=1}^{n} Y_i$ have the same meaning as in (A) above. A perfect hedge will return $RD_n = 0$ and high effectiveness would be indicated by $|RD_n|$ values close to zero. However, a correspondence with the 80/125 bright line would depend on the initial value of the hedged item and hence, vary on a case to case basis. Before documenting a hedging relationship, an entity must set a critical value (α) "sufficiently close" to zero such that

$|RD_n| \leq \alpha$ signifies hedge acceptability. Needless to say, the entity's auditors must concur with the method of testing and the choice of critical value.

(C) Variability Reduction Method

The Variability Ratio (VR) is defined as unity minus the ratio of the cumulation of the square of aggregate changes in the fair value or cash flow of the hedging instrument and the hedged item to the cumulation of the squared changes in the fair value or cash flows of the hedged item from a particular date. The ratio can be computed on a period by period basis or cumulatively. Thus, the Variability Ratio (VR) is given by

$VR = 1 - \left[\sum_{i=1}^{n} (X_i + Y_i)^2 \Big/ \sum_{i=1}^{n} Y_i^2 \right]$. The Variability-Reduction Method represents the variability of the fair value or cash flow of the hedged (combined) position to the variability of the fair value or cash flow of the hedged item alone. Since this method uses squared deviations, a greater emphasis results on the larger deviations than smaller ones. Variants of this method use standard deviations or variances or the proportion of mean squared deviations from zero of the hedged item that are eliminated by the hedge (Althoff and Finnerty, 2001; Kalotay and Abreo, 2001).

A perfect hedge will return $VR = 1$ and high effectiveness would be indicated by VR values close to one. However, a correspondence with the 80/125 bright line norm of the Dollar Offset Method would depend on a case to case basis. For instance, if we have (as a trivial example) $X_i = -0.80 Y_i \; for \; all \; i = 1, 2, ..., n$, then, $VR = 1 - (0.2)^2 = 0.96$ whereas if $X_i = -1.25 Y_i \; for \; all \; i = 1, 2, ..., n$, then, $VR = 1 - (-0.25)^2 = 0.9375$. Thus, it may seem that a critical value in the proximity of these figures may be an appropriate cutoff. However, it is strongly emphasized that the critical value standards for different methods, when applied, may not yield consistent results. As in case (B), it is necessary for entities adopting this method to set a critical value (β) "sufficiently close" to one for identifying hedge acceptability. It is cardinally important that the entity's auditors must also agree with the method of testing and the choice of critical value.

(D) Regression Analysis

It can be shown that the hedge ratio that minimizes the variance of the price of the combined hedged position is equal to the estimated slope coefficient of the regression run between the change in value of the hedged item (dependent variable) and change in value of the hedging instrument (independent variable) (Royall, 2001). We can, thus, write $Y_i = \hat{a} + \hat{b}(-X_i) + e_i$. Prospective hedge effectiveness would, then, be captured by the estimated (i) intercept term $\hat{a}$ (ii) slope coefficient $\hat{b}$ and (iii) adjusted coefficient of determination R^2 with a perfect hedge requiring $\hat{a} = 0$, $\hat{b} = R^2 = 1$ as these parameter values would imply $\rho_{hedged, deriavtive} = 1$, $\sigma_{hedged} = \sigma_{derivative}$ and a zero initial value of the hedging relationship. A high hedge effectiveness would be testified by the intercept $\hat{a}$ being close to zero and the slope $\hat{b}$ and adjusted R^2 both being near unity. A test statistic that encapsulates this three pronged prescription is given by the Regression Method Reduction of Variability i.e.

$RVR = 1 - \left[\sum_{i=1}^{n} (\hat{b} X_i + Y_i)^2 \Big/ \sum_{i=1}^{n} Y_i^2 \right]$. For retrospective testing, we need to substitute the actual hedge ratio in the aforesaid expression for RVR

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