Literature Review of IFRS 9 and Its Key Parameters

Conference Paper · May 2020

CITATIONS
3

READS
4,983

1 author:

Mojca Gornjak
International School for Social and Business Studies
12 PUBLICATIONS **31** CITATIONS

SEE PROFILE

Expanding Horizons
Business, Management and
Technology for Better Society
20–22 May 2020
Online Conference

make learn
TIIM

Management,
Knowledge and Learning
International Conference 2020
Technology, Innovation
and Industrial Management

Literature Review of IFRS 9 and Its Key Parameters

Mojca Gornjak
International School for Social and Business Studies, Slovenia
mojca.gornjak@issbs. si

Abstract

In this paper, we review the empirical literature on the accounting of financial instruments under IFRS 9. We focus on researches after the 1st of January 2018, which was the date of the first implementation of IFRS 9. We focus on three areas of work. The first area is a comparison of studies on the calculation of expected credit loss (ECL), impairments or loss allowance, and the impact on P&L. The second area is focusing on the probability of default and point in time models of loss projections which are the key parameters in ECL calculations. The third area of research comprises studies on loans, non-performing loans, and the impact on bank capital requirements. We discuss the most common studies in each field of IFRS 9 standard which are publicly available. Finally, we summarize findings on the impact of IFRS 9 introduction to stakeholders' value. Despite the multitude of researches, the available evidence doesn't allow the generalization of the question of whether the implementation of IFRS 9 has improved the loss allowance approach. One reason is that the application of the standard is effective from the 1st of January 2018 and that the insurance companies may delay the implementation of IFRS 9 until the introduction of IFRS 17 – insurance contract.

Keywords: IFRS 9, financial instruments, ECL, PD, impairment, loss allowance, PIT

INTRODUCTION

In July 2014, the new International financial reporting standard (IFRS) 9 for the accounting of financial instruments was published in the Official Gazette of the European Union. New IFRS 9 replaced the International accounting standard (IAS) 39 due to untimely recognition of loss allowances in the financial crisis. IFRS 9 is a principle-based standard with the forward-looking information incorporated in the calculation of loss allowances. The forward-looking approach is a novelty in accounting, and it is introduced in all new standards such as IFRS 16 – Leases and IFRS 17 – Insurance contracts. This new accounting for financial instruments was implemented for the first time on the 1st of January 2018 in all organizations which account under the IFRS except for insurers. Insurance companies should delay the implementation of IFRS 9 up to the date of implementation of IFRS 17 and prevent accounting mismatches.

The IFRS 9 introduced the new model of impairment of loss allowances which are arising from financial instruments. For all debt financial instruments which are not measured through the fair value,

organizations have to calculate ECL and recognized it in profit and loss account. For the financial instrument with low credit risk, organizations calculate 12-month ECL. If the credit risk worsens significantly between reporting and purchase date, the organizations have to calculate lifetime ECL which is a few times higher than 12-month ECL.

ECL is a risk factor that arises from the banking industry where the expected loss is used as part of the risk premium and is charged to the borrower (Bluhm et al., 2010, p. 2). The calculation of ECL basis on the net present value of the product of the probability of default (PD), loss given default (LGD) and exposure at default (EAD), and the PD is the very important and key factor. The PD is one of the most important risk parameters estimated in credit institutions for risk analysis and management (Vaněk & Hampel, 2017, p. 759).

The purpose of the paper is to discuss the review of the literature after the implementation of IFRS 9 which is the 1st of January 2018.

The paper is organized as follows: in the second section we introduced the endorsement criteria of IFRS 9 in European law and we look at official criteria for examinations and verification of IFRS 9, in section 3 we presented the transition from IAS 9 to IFRS 9, in section 4 we introduced the loss allowance projections and in next section, we discussed the key factor in ECL calculation which is PD. In section 6 we reviewed the loans and ECL calculations. In conclusion, we discussed the review of the literature and the possibilities for future research.

ENDORSEMENT CRITERIA FOR IFRS 9

Accounting for financial instruments had a long history back to 1988 when the International Accounting Standards Committee (IASC) set up a work project. In 1999 the IASC provided a set of accounting rules for the worldwide implementation that failed (Bischof & Daske, 2016, p. 155). The original version of International standard accounting 39 – Financial instruments (IAS 39) was adopted in 1998 and had a significant revision in 2005 (Bischof & Daske, 2016, p. 155). In 2009 the project for IFRS 9 started by International Accounting Standards Board (IASB).

Before the IFRS 9 was officially published in the Official Gazette of European Union, the three criteria for official examination was verified. The regulation 1606/2002 of the European Parliament and the Council on the application of international accounting standards introduced in its' 9th article introduced a set of three criteria for official examination (European Commission, 2002):

- a true and fair view of financial position and performance of the organization,
- conducted European public good, and
- the quality of information required for financial statements be useful for users.

The European authorities such as European Financial Reporting Advisory Group (EFRAG), European Banking Authority (EBA), European Insurance and Occupational Pensions Authority (EIOPA) and European Security and Markets Authority (ESMA) intervened in IASBs' development of the new standard (Bischof & Daske, 2016, p. 130). IASB changed the standard for multiple times before it's official pronouncement (Bischof & Daske, 2016, p. 130).

The reason for such verification in EU is in the fact that IASB is a private body, based in London, so the EU establishment and the EU process for all IFRS standards, pronounced by IASB have to go

through the endorsement criteria in EU and when each standard is endorsed in EU means that is not contrary to the true and fair view, is conducted to European public good and meet the criteria of understandability, relevance, reliability, and comparability to make economic decisions and assess the stewardship of management (Bischof & Daske, 2016, p. 131).

When all three criteria are met, the standard is published in the European Official Gazette and becomes binding accounting law for EU organizations. The process of introduction of IFRS 9 started in 2009 when G20 in London meeting urged the IASB to improve the valuation and provisioning of IAS 39 and the IFRS 9 was officially published in the Official Gazette of EU on 24th of July 2014.

Bischof and Draske (2016, p. 141) argued that IFRS 9 measurement does not lead to significant deviations for accounting rules included in the Accounting Directive in the true and fair view. IFRS 9 improves understandability in the view of qualitative criteria but there is no clear contradiction to the other three criteria (relevance, reliability, comparability) (Bischof & Daske, 2016, p. 145).

Accounting Directive was implemented in 1995 in six original EU members plus the UK and Spain as a European accounting harmonization measures in the Fourth and Seventh Directive on company law (Nobes, 2011, p. 272).

THE TRANSITION FROM IAS 39 TO IFRS 9

Accounting valuation in the scope of IAS 39 was considered as "too little, too late" and promoting cyclicality (de Haan & van Oordt, 2018, p. 296). Incurred loss models in IAS 39 prevent organizations to impair financial instruments in advance in economic downturns unless the objective evidence happened (significant financial difficulties of issuer or obligor, default or delinquency of payment of interest or principal, the probability that borrower will enter bankruptcy) and loss expected as a result of future events was not recognized (European Commission, 2005). IAS 39 did not allow reporting entities to incorporate the effect of future events occurring after the balance sheet date even if they were expected (Novotny-Farkas, 2016, p. 201) and that means that the loan losses were only considered when the loss was close to 100 percent.

The new IFRS 9 is incorporating a forward-looking approach in the measurement and valuation of financial instruments with a stochastic approach regarding the calculation of ECL and the parameters of PD, LGD, and EAD. The main differences between IAS 39 and IFRS 9 are presented in Table 1.

Table 1: Key differences between IAS 39 and IFRS 9

Category	IAS 39	IFRS 9
Subsequent measurement	The fair value. Amortized cost values. Costs (for the share-based instruments, which do not have a reliable fair value measurement).	The amortized cost (AC). Fair value through other comprehensive income (FVOCI). Fair value through profit or loss (FVTPL).

Types of classification	Fair value through profit or loss (FVTPL). Held-to-maturity (HTM). Loans and receivables (LAR). Available for sale (ASF).	The amortized cost (AC). Fair value through other comprehensive income (FVOCI). Fair value through profit or loss (FVTPL).
Reclassification	Reclassification shall be prohibited through profit or loss after initial recognition.	Change of business model.
Equity instruments	All equity instruments available for sale, are classified at fair value through other comprehensive income.	The fair value of the instrument for the purpose of trade. The irrevocable choice for the category through other comprehensive income.
Impairment	Several models of impairment. The model of incurred losses.	A unified model of impairment, which applies to all financial instruments. The model of expected credit loss.

Source: Adapted from Huian, 2012, p. 35.

IFRS 9 ECL model focuses on the default risk of financial instruments instead of the incurred loss model in IAS 39. The calculation of ECL is a sum of discounted future cash flows with the consideration of PD and LGD. The ECL is the sum of probability-weighted figures.

Equation 1: Calculation of expected credit loss

$$EL_t = \sum_{t=1}^{N} (PDt(It) \frac{LGDt(It)}{(1+dr)^t}$$

where:

ELt – expected life loss,

PDt(It) – cumulative probability of default,

LGDt(It) – loss given default,

dr – discounted rate for future cash flows,

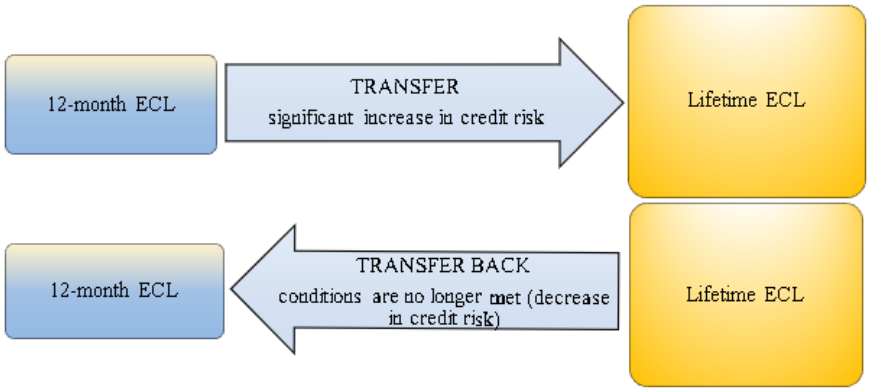
all parameters are upsized at new information at time t (It).

Source: Novotny-Farkas, 2015, p. 11.

As shown in equation 1, the calculation of expected life loss is the sum of the product of the probability of default (PDt) and loss given default (LGDt), which adapts to new information and discounted by the effective interest rate at initial recognition. Only fair value accounting includes all future losses arising from changes in the credit risk, which takes into account in PD and changes in market interest rates, which are included in the discounted interest rate (dr), and corresponds to the definition of the economic value of the loans (Novotny-Farkas, 2015, p. 11).

- In the scope of IFRS 9, the ECL is calculated as:
- 12-months ECL for those financial instruments with no significant change in the credit risk of
- lifetime ECL that results from all possible default events in the lifetime of financial instruments for those that have a significant increase in credit risk.

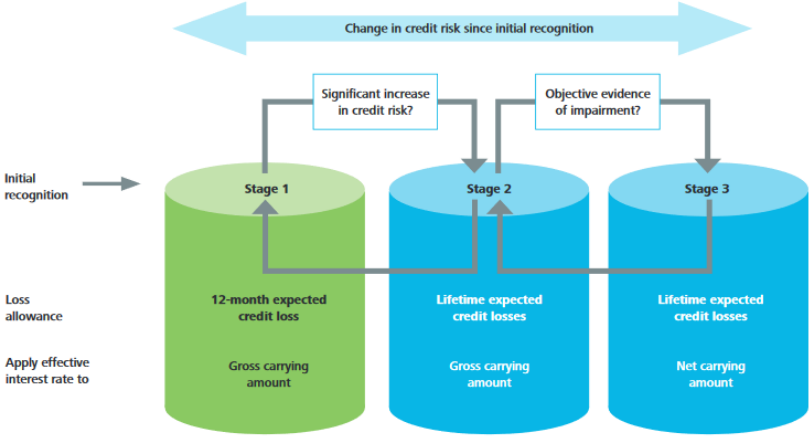
Figure 1: Transfer of financial instrument from 12-month ECL to lifetime ECL because of the significant change in credit risk



Source: Created by author

As shown in figure 1, at each reporting date the organization has to check the significant increase in credit risk since initial recognition. The change in credit risk since initial recognition is the key trigger in placing the financial instrument into the three-stage model of impairment in the scope of IFRS 9.

Figure 2: A general model of the impairment of the financial assets

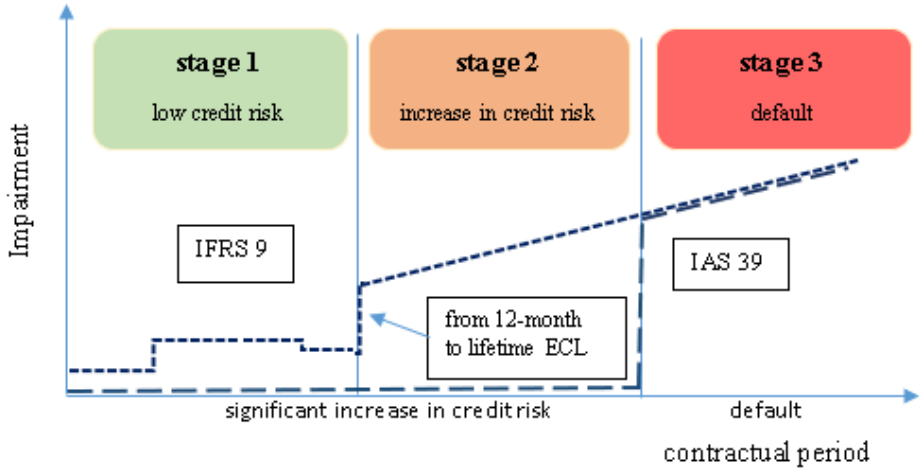


Source: Deloitte, 2016, p. 10.

In figure 2 we can see that in stage 1 are all financial instruments with no significant change in credit risk or low credit risk and all purchased financial instruments. In stage 2 are all financial instruments with a significant increase in credit risk. The significant increase is determined in the internal accounting policy. In stage 3 are all financial instruments with realized evidence of impairment and the interest revenue is calculated on net carrying amount.

The model of ECL is introduced for all debt financial instruments and the ECL is calculated for the contractual period of financial instruments. If we compare the incurred model from IAS 39 and the ELC model from IFRS 9 we can conclude that in the default, there are no differences in the calculation of impairment. The difference is between stage 1 and stage 2 where the impairment is higher in the ECL model as shown in figure 3.

Figure 3: Three-stage model of ECL under IFRS 9



Source: Created by author

The introduction of IFRS standards is demanding for organizations to employ or hire accountant professionals with IFRS skills and receptive to changes (Gulyás & Somogyi, 2019, p. 269).In the survey in the Hungarians banks in July to September 2018, which was after the implementation of IFRS 9, the employees in departments of treasury, accounting, IT, project management and risk management exposed three challenges:

- general,
- accounting and
- IT (Gulyás & Somogyi, 2019, p. 280).

The general challenges were the immaturity of the IT system, the large information requirement, and the shortage of time. The accounting challenges were changes in the impairment model, SPPI test, and issues relating to taxation. The IT challenge was the development of regulatory reports and the generation of data necessary. (Gulyás & Somogyi, 2019, pp. 280–283).

LOSS ALLOWANCE PROJECTIONS

The general rule in IFRS 9 is that the organization recognizes the part of the loss for the financial instrument resulting from ECL. On each reporting day, the organization shall be able to measure the ECL for the financial instrument in an amount equal to the entire life of the ECL in case if the credit risk on that financial instrument has changed significantly since initial recognition. When assessing the importance of an increase in credit risk, the organization shall verify the risk change and assess the risk of default on the reporting date with the risk of default on the day of initial recognition by taking into account reasonable and supported information available without undue increasing costs. However, if the credit risk does not change significantly, the organization shall recognize 12-monthly ECL on the reporting date. The organization recognizes the impairment in the profit and loss account as a loss allowance. (IAS Plus, 2016)

The organization shall measure the ECL of the financial instrument in a manner which reflects (IAS Plus, 2016):

- an impartial and plausible weighted value to be determined by estimation of different possible outcomes,
- time value of money and
- reasonable and supportive information available at no extra cost and effort on the date of reporting on past events, on the current situation, and the forecasts of future economic conditions.

The longest period of the ECL assessment is derived from the financial instrument and its contractual period.

Schutte et al (2020, p. 4) summarize that IFRS 9 has the requirement for a large amount of data for ECL calculation with PD and LGD factors and models. Because the standard is principle-based, there are no prescribe specific methodologies for lifetime ECL estimation (Schutte et al., 2020, p. 4).

When assessing whether the credit risk of the financial instrument has increased significantly since initial recognition, the organization should apply different approaches, and also use different approaches for various financial instruments.

The approaches used to determine the substantial increase in credit risk at initial recognition shall take into account the characteristics of the financial instrument (or group of financial instruments) and the past information for comparable financial instruments.

The organization shall carry out an ECL assessment based on credit risk analyses with important information in evaluating the change in credit risk (IAS Plus, 2016):

- significant changes in internal price indicators,
- other changes in the rates or conditions of the existing financial instrument,
- significant changes in external credit risk market indicators,
- the actual or expected internal credit assessments of the borrower who reduce the value of credit risk assessment within the organization,
- actual or expected major changes in the business results of the borrower,

- significant increase in credit risk for other financial instruments of the same borrower,
- the actual or expected substantial adverse changes to the regulatory, economic or technological environment of the borrower, which results in significant changes in the ability of the borrower to fulfill its obligations, such as the decline in demand for sales,
- significant changes in the value of collateral to cover the obligation or quality of warranties of third parties or credit improvements which are expected to impair planned contractual payments or otherwise affect the likelihood of defaults,
- significant changes of shareholder collateral (or associated organizations) if the shareholder has an incentive and financial capacity to prevent default by capital or money transfer,
- significant changes, such as the reduction of financial support by the parent organization or other branches, such as the actual or expected significant change in the quality of credit capability,
- the expected changes in the loan documentation, including the expected breach of the contract, which may lead to a waiver or modification of the arrangements, interest payments,
- significant changes in the expected performance and behavior of the borrower, including changes in the remuneration status of the borrower group,
- changes in the approach to credit management of the organization concerning the financial instrument,
- information due date.

Sometimes qualitative information and non-statistical quantitative information should be sufficient to determine whether the financial instrument meets the criteria for impairment and calculation of ECL, calculated as the probability of a personalized credit loss assessment, which represents the current value of all cash deficits in the expected era of the financial instrument. In the case of financial assets, ECL is the difference in the net present values of (IAS Plus, 2016):

- contractual cash flows and
- the cash flows expected by the organization.

The loss allowance is calculated for all debt financial instruments that are measured at fair value through other comprehensive income or at amortized costs. ECL is recognized at the initial recognition of debt instrument as ECL allowance or credit impaired losses in profit or loss. If the debt instrument is measured at fair value through other comprehensive income, then the change in fair value or other carrying amounts are recognized in other comprehensive income. At derecognition, all gains or losses in other comprehensive income are recycled to profit and loss. This means that all 12-months or lifetime ECL are charged to income and all other non-credit related changes are recognized in other comprehensive income (Novotny-Farkas, 2016, p. 204).

THE KEY PARAMETER IN ECL CALCULATION – PD

The calculation of ECL arises from banking where the expected loss is used as part of the risk premium and is charged to the borrower (Bluhm et al., 2010, p. 2). In probability theory, the "expected" attribute always refers an expectation or mean value, which is also an example in risk management, and means that the probability of default is attributed to each entity, which is part of the loss and is called a loss given default (LGD) and exposure to non-payment which represent the loss that could occur during a given period (Bluhm et al., 2010, p. 3).

The Standard and Poor's identifies the loss as the inability to pay the principal or interest on the maturity date contained in the original conditions for the issue of the debt, resulting in a definition of the probability of default (PD) (Venter, 2016, p. 14). Randomly selected L – the risk of default may be or payment or non-payment.

Equation 2: Probability of default

$$L = \begin{cases} 1 \text{ in the case of payment} \\ 0 \text{ in the case of non} - \text{payment} \end{cases}$$

Source: Adopted from Venter, 2016, p. 14.

Variable L is a Bernoulli random variable with PD.

Equation 3: Calculation of P for non-payment

$$P(L = 1) = P\ (\text{non} - \text{payment}) = p = PD$$

and

Equation 4: Calculation of P for non-payment

$$P(L = 0) = P\ (payment) = P(\text{going concern}) = 1 - p$$

Source: Adapted from Venter, 2016, p. 14.

The expectations and variance L are shown in Equation 4: Basic Equation 5 presents the basis of Risk Management (Venter, 2016, p. 14):

Equation 5: Calculation of expectations and variance for L

$$P(L = 0) = P\ (payment) = P(\text{going concern}) = 1 - p$$

$$P(L = 0) = P\ (payment) = P(\text{going concern}) = 1 - p \text{ and follows}$$

$$P(L = 0) = P\ (payment) = P(\text{going concern}) = 1 - p$$

Source: Adapted from Venter, 2016, p. 14.

A forward-looking calculation should base on accurate estimations of current and future cash flows and also on macroeconomic data for financial instruments (Adamu, 2018, p. 93).

IFRS 9 regulation provides the use of macroeconomic forecasts and probability-weighted outcomes in calculating the impairments or loss allowance.

The calculation of ECL basis on the net present value of the product of PD, LGD, and EAD, where the PD is the important and key factor. The PD is one of the most important risk parameters estimated in credit institutions for risk analysis and management (Vaněk & Hampel, 2017, p. 759).

The credit risk is a potential that the borrower will fail to meet its contractual obligations (Basel Committee on Banking Supervision, 2001, p. 45).

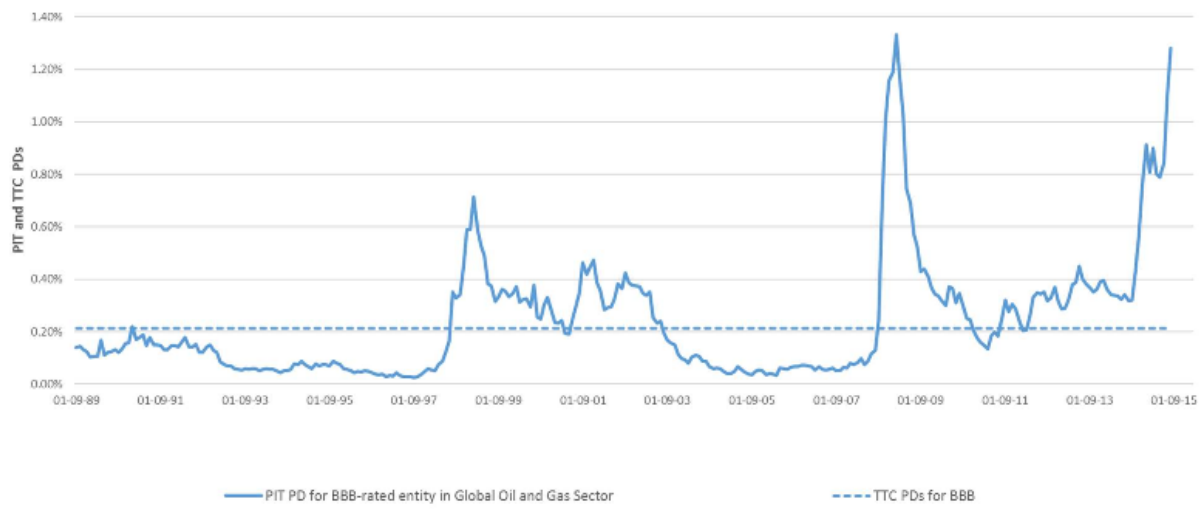
The credit risk approach in IFRS 9 was implemented for all financial instruments which are not measured at fair value through profit and loss. The model of ECL is used for all debt financial instruments recognized at amortized costs or fair value through other comprehensive income, such as loans, debt securities or bonds, trade receivables, lease receivables, loan commitments, financial guarantee contracts (Gornjak, 2019, p. 34; Novotny-Farkas, 2016, p. 204; Vaněk & Hampel, 2017, p. 761).

Each organization has to:

- define the risk of default that is customized to it portfolios and data,
- define the mechanism of quantifying a significant increase in credit risk,
- define threshold levels for quantification of significant change (a measurement of financial instrument form stage 1 to stage 2),
- have a robust implementations strategy to run the process at each reporting date (Chawla et al., 2016, p. 72).

In the scope of IFRS 9, the PD has to be a point in time (PIT) and not through the cycle (TTC) as the banking sector uses in its calculation of the probability of default.

Figure 4: Differences between PIT and TTC PD



Source: Chawla et al., n.d., p. 76 cited Moody's Analytics CreditEdge and UK/US government statistics, Z-Risk Engine.

As shown in figure 4, the TTC PD is not changing over the period, unless the PIT PD is changed because of the change in probability of default over the period.

Historical unadjusted TTC PD should be modeled conditional to state variables to forecast so-called PIT PD. The concept of PIT PD was introduced by Belkin, Suchower, and Forest in 1998 that proposed one parameter representation of credit risk and transition matrices. (Đurović, 2019, p. 210).

PIT estimations of main parameters such as PD and LGD increase the volatility of regulatory capital for some banks (Novotny-Farkas, 2016, p. 197).

LOANS AND ECL CALCULATION

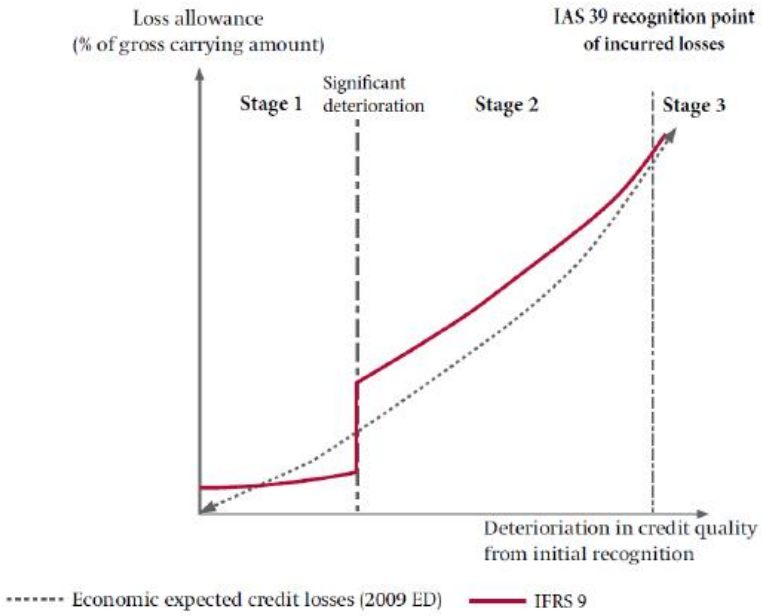
Loan accounting in IFRS 9 is the subject of impairment and about 80 percent of loans in the banking sector are measured at amortized costs business model (Sanchidrián & García, n.d., p. 152).

IFRS 9 was introduced due to the banking sector failing to make adequate provisions promptly during the last financial crisis beginning in 2008. IAS 39 approach was "too little, too late", but IFRS 9 approach is more forward-looking (Seitz et al., 2018, p. 313). The three-stage model of ECL in the scope of IFRS 9 requires a loss allowance from the date of purchase or initial recognition of debt financial instrument. Some authors (Sigee, 2017) discussed IFRS 9 as pro-cyclic.

The new model of ECL should result in an earlier and larger recognition of loan reserves (Novotny-Farkas, 2015) and exceed the levels of IAS 9 reserves during the crisis (Seitz et al., 2018, p. 314) but in a normal business, the loan reserves are not generally higher (Seitz et al., 2018, p. 346). The author argues that the reserves are very volatile to the changes in the market and parameters and differ substantially between the troubled and non-troubled bank as well as across EU countries and regions (Seitz et al., 2018, p. 346). The research pointed out that the high sensitivity of ECL is depending on PD models such as PD models based on CDS spreads or based on Moody's data.

The first introduction of ECL in 2009 included over the lifetime recognition of credit losses through credit adjusted effective interest rates. In the proposal, there was at the initial recognition loan loss allowance equal to nil and it was subsequently built up over the lifetime of a financial asset (Novotny-Farkas, 2016, p. 204). This model was the closest to the economic valuation of the loan but it changed into a three-stage model of ECL.

Figure 5: Three-stage model of ECL under IFRS 9



Source: Novotny-Farkas, 2016, p. 204

As shown in figure 5, at initial recognition IFRS 9 overstates the loan loss allowance under the economic valuation of the loan and expressed as economic expected credit losses (2009 ED). With the increase of

PD, the credit risk increases, so IFRS 9 understates the loan loss allowance. At deterioration of credit quality, IFRS 9 again overstates the allowance. (Novotny-Farkas, 2016, p. 204)

Earlier recognition of credit losses reduces the build-up of loss-overhangs and overstatement of regulatory capital and might enhance financial stability (Novotny-Farkas, 2016, p. 197). On the other hand, the loan loss provision in the statement of financial position is a key accrual item with a significant impact on earnings and regulatory capital calculations (Novotny-Farkas, 2016, p. 205).

Some researches focus on their researches of loans on benchmark testing (Cefis, 2017; Popescu & Ionescu, 2019). As proposed in IFRS 9 there should be a qualitative and quantitative assessment for future cash flows which are solely payment of interests and principal. One of the options is benchmark testing. Cefis (2017) addresses quantitative assessment in light of the time value of money. IFRS 9 defines the time value of money as an element of interest that provides consideration for only the passage of time (IASB, 2016, p. A446). According to Cefis (2017, p. 5), the "test instrument" which presents convexity since its underlying interest rate tenor is different from instrument payment tenor and is characterized by cashflows whose value are different from those of corresponding "benchmark instrument" which cashflows do not show convexity issues and whose underlying interest rate tenor is the same as payment tenor.

Popescu (2019, p. 218) also analyze the time value of money and the component from interest and consider only the passage of time without other costs associated with holding a specific financial asset.

IFRS 9 allows the modification of the time value of money for variable interests such as EURIBOR, LIBOR, ROBOR with the benchmark testing, and performance of qualitative and quantitative analysis (IASB, 2016, pp. A446–A447). The factors which should be considered by assessing the benchmark test are:

- the instrument by instrument basis (difference in cash flows arising from modified instrument versus perfect instrument),
- reporting period (SPPI test must be performed at initial recognition, benchmark test must be performed at initial recognition and on each reporting date),
- reasonable scenario, exclusion or inclusion of principal amounts (assessment only of interests, but monthly payments can include both, interests and principal) and
- relative versus absolute threshold (use of relative analysis or absolute measures) (Popescu & Ionescu, 2019, pp. 219, 220).

Definition of non-performing loans (NLP's) is different in different jurisdictions but in the scope of IFRS 9 that means that the loans are in stage 3 and payments of interests or principal are past due by 90 days or more. NLP's and their under-provisioning pose a danger to economic and financial stability especially where over-extension lending led to a crisis (Bholat et al., 2018, p. 53) but the crisis is caused by poor landing rather than accounting or reporting. Early recognition of expected losses in good times is generally agreed by policymakers (Bholat et al., 2018, p. 53) and IFRS 9 could contribute to understandable methods of loss provisioning of assets and loans.

CONCLUSION

The new IFRS 9 is generally changing the view of accounting. The new standards introduced after the financial crisis are principle-based with forward-looking approaches incorporated into the accounting figures. After the introduction of IFRS 9, there are no rules on how to account for the financial instruments and the organizations should present their approaches and views in internal accounting policies.

The model of ECL in accordance of IFRS 9 servers as an adjustment to the credit spread that is recognized through yield and results in less overstated profit and lowers distribution of profits such as dividends and bonuses during boom periods and in the end to the higher capital to withstand losses during downturns (Novotny-Farkas, 2016, p. 217).

In a downturn, the accounting of ECL exceeds the regulatory expected losses because of the PID PD and higher calculated ECL in stage 2 and stage 3 model of ECL. The model of ECL accounts for lower loss allowances in the economic growth and significantly larger allowances in economic crisis according to the incurred losses in the scope of IAS 9.

Credit losses are estimated on macroeconomics scenarios and are recognized at an earlier point in time which means that the banks have to reserve extra capital buffers in good times to prepare for potential increases in provisions when macroeconomic indicators deteriorate. Earlier recognition of credit losses could incentivize banks to adopt more prudent and less cyclical lending strategies and strengthen the monitoring of credit risk. (Frykström & Jieying, 2018, p. 6)

IFRS 9 might improve financial stability and reduce pro-cyclicality in downturns. Loss allowances are accounted in the recognition of asset or loan and with the significant increase in credit risk, the loss allowance is significantly cliff effect because of the calculation from 12-months to lifetime ECL. IFRS 9 also added transparency with the additional notes in annual reports of organizations. EBA also announced that the impact of ECL calculation on stress test scenarios was implemented in 2018 (Frykström & Jieying, 2018, p. 8).

We can conclude, that the accounting of provisions for ECL has an impact on the valuation of financial instruments and statement of profit or loss at the time of replacement and later and on capital requirements (Cohen & Edwards, 2017; Deloitte, 2018; Gebhardt, 2015; Ha, 2017; HSBC Holdings plc, 2018) and affect the shareholders' value. In the good economic condition, the impact of impairment on profit and loss should be lower than in the downturn, when the significant credit risk deterioration requires the calculation of lifetime ECL instead of 12-month ECL. The implementation of IFRS 9 is lowering the shareholders' value because of the ECL model. Further qualitative or quantitative research should analyze the impact of the replacement to financial statements and shareholders' value.

REFERENCES

Adamu, J. A. (2018). IFRS 9 Measurement of Financial Instruments 2018: Jameel's Non-Normal Brownian Motion Models are Indeed IFRS 9 Complaint Models. *Journal of Economics and Management Sciences*, *1*(1), p92. https://doi.org/10.30560/jems.v1n1p92

Basel Committee on Banking Supervision. (2001). *The internal ratings—Based approach* (pp. 1–102) [Consultative Document]. Bank for International Settlements. https://www.bis.org/publ/bcbsca05.pdf

Bholat, D., Lastra, R. M., Markose, S. M., Miglionico, A., & Sen, K. (2018). Non-performing loans at the dawn of IFRS 9: Regulatory and accounting treatment of asset quality. *Journal of Banking Regulation*, *19*(1), 33–54. https://doi.org/10.1057/s41261-017-0058-8

Bischof, J., & Daske, H. (2016). Interpreting the European Union's IFRS Endorsement Criteria: The Case of IFRS 9. *Accounting in Europe*, *13*(2), 129–168. https://doi.org/10.1080/17449480.2016.1210181

Bluhm, C., Overbeck, L., & Wagner, C. (2010). *Introduction to Credit Risk Modeling, Second Edition.* CRC Press. http://public.eblib.com/choice/publicfullrecord.aspx?p=1633141

Cefis, L. A. (2017). Testing for Convexity Relevance: An IFRS 9 Benchmark Cashflow Test Proposal. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.2969122

Chawla, G., Forest Jr, L. R., & Aguais, S. D. (2016). Point-In-Time (PIT) LGD and EAD Models for IFRS9/CECL and Stress Testing. *Journal of Risk Management in Financial Institutions*, *9*(3). https://www.z-riskengine.com/media/1064/pit-lgd-paper-chawla-forest-aguais-re-submitted-to-journal-v3-for-web.pdf

Cohen, B. H., & Edwards, G. A. (2017). The new era of expected credit loss provisioning. *BIS Quarterly Review*, 39–56.

de Haan, L., & van Oordt, M. R. C. (2018). Timing of banks' loan loss provisioning during the crisis. *Journal of Banking & Finance*, *87*, 293–303. https://doi.org/10.1016/j.jbankfin.2017.10.003

Deloitte. (2016). *IFRS in Focus, IFRS 9: Financial Instruments – high level summary*. Deloitte Touche Tohmatsu Limited. http://www.iasplus.com/en/publications/global/ifrs-in-focus/2016/ifrs-9/at_download/file/IFRS%20in%20Focus%20IFRS%209%20April%202016.pdf

Deloitte. (2018). *Securitisation: Reducing risk and accounting volatility*. Deloitte Touche Tohmatsu Limited. https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=2&ved=0ahUKEwjpsMzCjMvbAhXsB5oKHX_iCnwQFgg1MAE&url=https%3A%2F%2Fwww2.deloitte.com%2Fcontent%2Fdam%2FDeloitte%2Fuk%2FDocuments%2Ffinancial-services%2Fdeloitte-uk-ifrs-9-securitisation-reducing-risk-and-volatility.pdf&usg=AOvVaw0fJT40cydyQCPkoMuxZJaF

Đurović, A. (2019). Macroeconomic Approach to Point in Time Probability of Default Modeling – IFRS 9 Challenges. *Journal of Central Banking Theory and Practice*, *8*(1), 209–223. https://doi.org/10.2478/jcbtp-2019-0010

European Commission. (2002). *Regulation (EC) No 1606/2002 of the European Parliament and of the Council of 19 July 2002 on the application of international accounting standards*. Official Journal of the European Union. https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A32002R1606

European Commission. (2005). *Commission Regulation (EC) No 2106/2005 of 21 December 2005 amending Regulation (EC) No 1725/2003 adopting certain international accounting standards in accordance with Regulation (EC) No 1606/2002 of the European Parliament and of the Council, as regards International Accounting Standard (IAS) 39*. Official Journal of the European Union. https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32005R2106:EN:HTML

Frykström, N., & Jieying, L. (2018). FRS 9 – the new accounting standard for credit loss recognition. *Economic Commentaries*, *3*, 1–13.

Gebhardt, G. (2015). *Impairments of Greek government bonds under IAS 39 and IFRS 9: Study for the ECON committee*. Directorate-General for Internal Policies, Policy Department A, Economic and Scientific Policy. http://dx.doi.org/10.2861/787665

Gornjak, M. (2019). Forward-looking approach in the accounting of financial instruments: Case study of Slovenian Pension Company. *International Journal of Innovation and Learning*, *26*(1), 27. https://doi.org/10.1504/IJIL.2019.100513

Gulyás, É., & Somogyi, C. (2019). Experiences Relating to the Introduction of IFRS 9 In the Banking Sector. *Economy & Finance*, *6*(3), 266–295. https://doi.org/10.33908/EF.2019.3.3

Ha, Y. S. (2017). *Transition to IFRS 9: Practical Guidance for the Foreign Reserves of Central Banks*. World Bank. https://openknowledge.worldbank.org/handle/10986/27471

HSBC Holdings plc. (2018). *Report on Transition to IFRS 9 'Financial Instruments' 1 January 2018*. HSBC Holdings plc.

https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=8&ved=0ahUKEwj504-Mj8vbAhXFaFAKHU6CArsQFghbMAc&url=https%3A%2F%2Fwww.hsbc.com%2F-%2Fmedia%2Fhsbc-com%2Finvestorrelationsassets%2Fhsbc-results%2F2017%2Fannual-results%2Fhsbc-holdings-plc%2F180227-report-on-transition-to-ifrs9-financial-instruments-1-january-2018.pdf&usg=AOvVaw2_G0QSuE9rTDKW9ne19fgm

Huian, M. C. (2012). Accounting for Financial Assets and Financial Liabilities According to IFRS 9. *Annals of the Alexandru Ioan Cuza University - Economics*, *59*(1). https://doi.org/10.2478/v10316-012-0002-0

IAS Plus. (2016). *IFRS 9—Overview*. http://www.iasplus.com/en/standards/ifrs/ifrs9

IASB. (2016). *IFRS 9 Financial instruments*. International Accounting Standards Board. http://eifrs.ifrs.org/eifrs/bnstandards/en/2016/ifrs09.pdf

Nobes, C. (2011). IFRS Practices and the Persistence of Accounting System Classification: IFRS ACCOUNTING SYSTEM CLASSIFICATION. *Abacus*, *47*(3), 267–283. https://doi.org/10.1111/j.1467-6281.2011.00341.x

Novotny-Farkas, Z. (2015). *The Significance of IFRS 9 for Financial Stability and Supervisory Rules*. European Union, Policy Department A: Economic and Scientific Policy. http://www.europarl.europa.eu/RegData/etudes/STUD/2015/563461/IPOL_STU(2015)563461_EN.pdf

Novotny-Farkas, Z. (2016). The Interaction of the IFRS 9 Expected Loss Approach with Supervisory Rules and Implications for Financial Stability. *Accounting in Europe*, *13*(2), 197–227. https://doi.org/10.1080/17449480.2016.1210180

Popescu, M. – M., & Ionescu, B.-S. (2019). IFRS 9 Benchmarking Test: Too Complicated to Worth Doing It? *ECONOMIC COMPUTATION AND ECONOMIC CYBERNETICS STUDIES AND RESEARCH*, *53*(1/2019), 217–230. https://doi.org/10.24818/18423264/53.1.19.14

Sanchidrián, J. P., & García, C. J. R. (n.d.). UNVEILING THE EXPECTED LOSS MODEL IN IFRS 9 AND CIRCULAR 4/2017. *Estabilidad Financiera*, *2019*(6), 147–164.

Schutte, W. D., Verster, T., Doody, D., Raubenheimer, H., & Coetzee, P. J. (2020). A proposed benchmark model using a modularised approach to calculate IFRS 9 expected credit loss. *Cogent Economics & Finance*, *8*(1). https://doi.org/10.1080/23322039.2020.1735681

Seitz B., Dinh T., & Rathgeber A. (2018). Understanding loan loss reserves under IFRS 9: A simulation-based approach. *Advances in Quantitative Analysis of Finance and Accounting*, *16*, 311–357. https://doi.org/10.6293/AQAFA.201812_16.0010

Sigee, J. (2017). *European Banks: IFRS9 – Bigger than Basel IV*. 36.

Vaněk, T., & Hampel, D. (2017). The Probability of Default Under IFRS 9: Multi-period Estimation and Macroeconomic Forecast. *Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis*, *65*(2), 759–776. https://doi.org/10.11118/actaun201765020759

Venter, E. S. (2016). Probability of default calibration for low default portfolios: Revisiting the Bayesian approach. *University of Stellenbosch, Department of Statistics and Actuarial Science*, 1–105.