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International Financial Reporting Standards (IFRS 9) and International Accounting Standard 39 (IAS 39) from 2003 to 2019: Bibliometric Analysis

Abdallah Al-Hanandeh*[1], Aniza Othman[1], Norhamimah Mastor[1], Ibrahim ALnohoud[1], [1]Department of Accounting and Finance, Azman Hashim International Business School, Universiti Teknologi Malaysia, Johor Bahru, Malaysia, Corresponding Author: Abdalla_hanandeh@yahoo.com

International standards are one of the main pillars of financial accounting operations through their ability to control and regulate financial calculations, as it is in the literature review. Consequently, the International Accounting Standard 39 (IAS 39) and the International Financial Reporting Standards 9 (IFRS 9) have a direct impact on the accounting operations of banks and financial institutions. This study aimed to determine the status of the IAS 39 and IFRS 9, identify its main areas, and assess available evidence. In this paper, we focussed on our research study on the web of science for the period 2003-2019. The research was based on the following keywords: "IAS 39" or "international financial reporting standards 39" and "IFRS 9" or “international financial reporting standards 9" and "expected loss model" or "ECL model". From 121 papers found, twenty full publications are included in this study. The results of the selected articles divided into three clusters: standards, risk, and management. Also, the finding is most of the researches cover European and developed countries. Moreover, most of the previous studies examined the impact of IFRS 9 from the theoretical perspective and few studies cover 1-year's impact.

Key words: *Bibliometric Analysis, International Financial Reporting Standards, IFRS 9, IAS 39, ECL model.*

Introduction

The financial sector is one of the most important sectors all over the world because of its effect on national economic growth and general business development through providing financial facilities to all economic enterprises and individual investors, and to create a more stable financial system (Mendoza & Rivera, 2017). Therefore, credit losses play a central role in assessing risk and stability in banks and have a great economic importance because credit loss is often the main reason why banks fail (Marton & Runesson, 2017). Due to the crisis that happened in 2007-2008, users complained about the International Accounting Standard (39) that was approved in December 1998, which was revised in October 2000 and December 2003. This last revision applies to the financial statements with effect from 1 January 2005 (SY, 2017). There was a shortage of an appropriate risk estimation or provisioning for pro-cyclical loan losses, and they demanded implementation of an easier and more suitable accounting standard to the surrounding environment and data that reflects the financial performance of the organisations: the development of the financial reporting standard (9) was one of the responses whose purpose was to address the deficiency of the accounting and to contribute in introducing clarifying methods for treating these processes (Gomaa, Kanagaretnam, Mestelman, & Shehata, 2019). The credit losses are one of the main elements in many financial institutions and banks that assess their risk and stability (Marton & Runesson, 2017), however this process carries enormous risks in terms of both the lender and the borrower (Ramazan Ekinci, 2019). With changing from IAS 39 to IFRS 9, quite a variety of IFRS-related publications have appeared. In fact, each of these articles about these international standards does not provide a comprehensive review of IFRS literature. Studies on IAS 39 and IFRS 9 and the growing studies hotspot viewpoint in this field have so far provided limited attention.

Thus, the present study aims to investigate the IAS 39 and IFRS 9 for the last seventeen years (2003-2019) – from the first study found during the search in web of science (WOS) that is considered one of the most core web readings of all academics concerned – then, studying the key dimensions of its publication trends. The study is an effort to document the key authors, articles, and major publications to further improve the state of research in the subject established herein.

Review of literature

The main objective of banks and financial institutions to reach a maximum rate of profitability will be in line if the operations of raising funds and channelling capital to banks are carried out effectively and efficiently. The distribution of credit is one of the main activities of the bank to sustain a rise in productivity. Additionally, to being ahead of bank profits, lending practices pose a high risk that can be one of the main causes of troubled banks(Delgado-Vaquero, Morales-Díaz, & Zamora-Ramírez, 2019). Whereas credit losses are often the primary reason behind bank failures (Ramazan Ekinci, 2019). The high number of defaulters due to banks ' permissiveness and supervision structures in credit granting was the main reason for the ongoing financial crisis (Alaraj, Abbod, & Al-Hnaity, 2015). The financial crisis has shown that accounting standards, in general, are not relevant to the stream economic environment and showing that they are not adequately successful in addressing with this changing environment (FASB, 2010) which made it clear to policymakers that the methods of accounting losses and conditional risk provisioning were too weak because they did not recognise the decline of creditworthiness in due time led to scathing criticism of accounting (Landini, Uberti, & Casellina, 2019). At the time, the impairment requirement model was IAS 39 based on a 'model of loss incurred.' This model recognises credit losses only after a credit loss event occurs or when there is evidence of a trigger event (EY, 2014). In response, the International Accounting Standards Board (IASB) stepped up work on the IFRS 9 specification to remedy these shortcomings. IFRS 9 has replaced IAS 39 on 1 January 2018 and resolved many deficiencies caused by the crisis. IFRS 9 was established over five years in three stages relating to "classification and measurement" (Phase One), "impairment" (Phase Two), and "hedge accounting" (Phase Three).

Nevertheless, systematic analyses and in-depth analyzes of IFRS 9 and the adaptation to this new standard are still scarce in academic literature (Seitz, 2019). International Accounting Standard Board claimed "IFRS 9 both helps users to understand and use the financial reporting of financial assets and eliminates much of its complexity in IAS 39 (Al-Jamal, 2017). The advent of the succeeding IFRS 9 constitutes a paradigm shift in the calculation of impairments in financial institutions. It profoundly changes the recognition of deteriorating credit quality by switching from an incurred to an expected credit loss model (ECL). Instead of realising losses when they occur, their expected value is now gradually realised over the lifetime of the loan. This adjustment is intended to lessen the severity of sudden jumps in losses ("cliff-effect") (Kund & Rugilo, 2018). Hence, considered loan loss provisioning (impairment rules) is one aspect significantly affected by the IFRS 9 changes for many entities, this has proved to be the most important change (that with the highest impact). It is not only banks that have been impacted by the new impairment rules; in fact, all kinds of entities are making changes to their provisioning criteria (Delgado-Vaquero et al., 2019). This model obliges entities to recognise ECLs from the initial recognition throughout the lifetime of a financial asset by including these losses in the effective interest rate (EIR) calculation. By using this method, the loss allowance will be centred on the financial asset's entire lifetime and will thus match the recognition of credit losses. Subsequent improvements in the perceptions of credit risk would be reflected in earnings or loss adjustments based on the original EIR(SY, 2017).

Data and methodology

The research is characterised by its use of articles extracted from the Web of Science citations, which are classified as descriptive and give a quantitative approach (Costa, Carvalho, & Moreira, 2019).In this section, this paper addresses methods for performing a detailed quantitative bibliometric-oriented review : (1) compilation of references and information, (2) mapping of research and resources.

Source and data collection

Bibliometric can be recovered from different sources, such as the Scopus or Web of Science (WOS).The primary Web of Science used in this research because it is widely applied for inhomogeneous reviews, as a more reliable database of scientific literature. Using Web of Science was chosen on the importance that the science landscape attaches to this database, mainly because it provides access to more than 12,000 scientific journals and researchers worldwide, and to more than a billion references referred to, as of 2016 (Costa, de Melo Carvalho, de Melo Moreira, & do Prado, 2017). Additionally, it was possible to standardise the data by choosing only one database (do Prado et al., 2016). Furthermore, bibliometric permits the listing of relevant aspects by implies of quantitative techniques such as authors, co-authors, citations, co-citation, keywords, journals, etc.(Sánchez-Riofrío, Guerras-Martín, & Forcadell, 2015).

The preliminary processing is the most important step, whereas the quality of the outcome will rely on the goodness of the data in this step. To restrict the important articles in this research, the number of keywords is determined and then the strategy of searching was as follow: Topic : ("IAS 39" OR "International Financial Reporting Standards 39" OR "IFRS 9" OR "International Financial Reporting Standards 9" OR "expected loss model" OR "ECL model").Publication years from 2003 -2019.

Table 1. Numbers of publications in the data based (WoS) site focused on selected words

Type	2003	2004	2005	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Article	1	2	_	2	_	4	3	3	5	2	6	14	17	15	13
Book	_	_	_	_	_	_	_	_	_	_	1	_	_	_	_
Book chapter	_	_	_	_	_	_	_	_	_	_	1	_	_	_	_
Editorial material	_	_	_	_	_	_	_	_	_	_	1	_	_	_	_
Proceeding	_	_	2	1	1	3	2	3	_	3	1	2	5	5	3
Total	1	2	2	3	1	7	5	6	5	5	10	16	22	20	16
Total of searching							121								

According to Arksey and O'Malley (2005), the methodological framework embraces five stages of research flow. First step: Identifying the research question. Second step: Identifying relevant studies. Third step: Study selection. Fourth step: planning data. Final step: collecting, summarising data, and reporting results. The five steps are shown in **figure 1**:

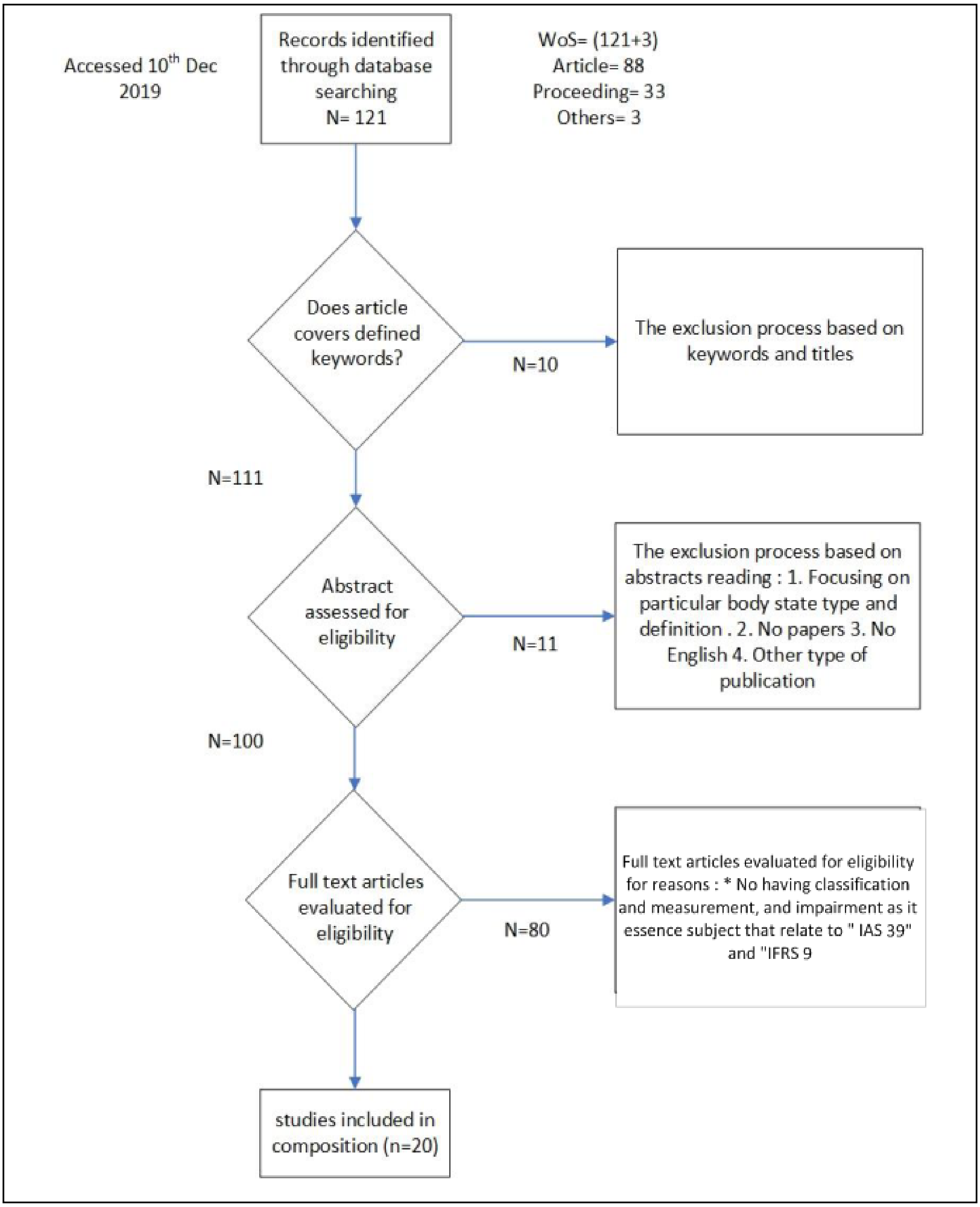

Figure 1.Meta-Analyses (PRISMA) and Systematic Reviews flow chart of the research process.

Data Extraction and Study Quality Assessment

According to Maskuriy, Selamat, Ali, Maresova, and Krejcar (2019), eligible work was isolated by the researcher. In terms of the following elements, the papers were pedantic: title, country of publication, author(s), and publication type. The following specific set of criteria had to be met for a study to be selected for further review:
(1) Published until December 2019,
(2) Focusing on the IAS 39 and IFRS 9,
(3) The transaction with questions concerning classification and measurement and impairment.
(4) Discussing the IAS 39 and IFRS 9 trends, and challenges for the IFRS 9.
(5) Studies related to estimation credit losses (ECL) for banks and other companies, and
(6) Written in English.

Publications excluded depending on the following standards:

(1) Focusing on the description of a particular condition, for example, "hedge effectiveness" or "Investor reaction to IFRS."
(2) Discussing a specific solution;
(3) Written in a language other than English;
(4) Inaccessible papers

Results

After identifying and evaluating the papers published on WOS, these studies indicated that the most common keywords used for "IAS 39" and "IFRS 9" could be clustered into at least three clusters, as shown in **Figure 2**.which displays the most co-occurring keyword search related to selected words in WOS with the minimum number of occurrence of keywords being at least five occurrences. From 560 keywords, 24 met the threshold. For each of the 24 keywords, the total strength of the co-occurrence links with other keywords was generated.

The cumulative intensity of the co-occurrence links to all keywords was created for each of the selected keywords. Only the keywords with the greatest total link strength were selected. Co-occurrence is the term used to describe the proximity of keywords in the abstracts, titles, or keywords list in publication to find connections so that the research topic can be identified. The link indicates the strength of their occurrences.

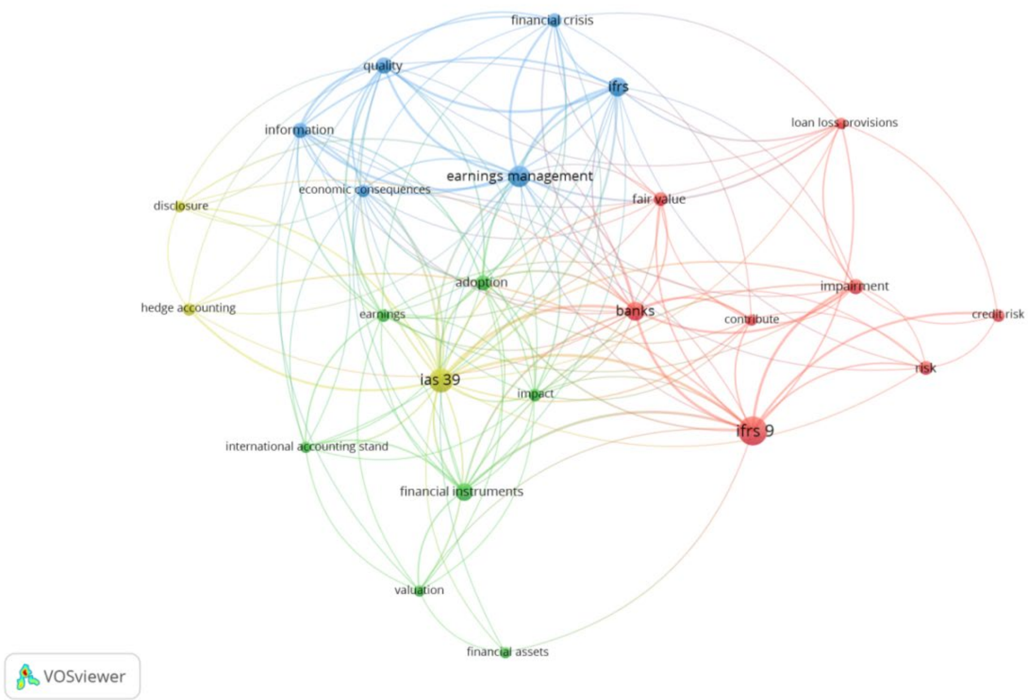

Figure 2. The most generally co-occurring keywords search related to the selected words in WOS, with 121 studies.

Table 2. Shows cluster for the keywords that co-occur together in WOS while searching for keywords related to the selected words. Table 3 shows the available cluster of the co-occurrence keywords and strongest occurrences from the selected keyword search in WOS and the total link strength of the linked keywords to the keyword search. IFRS 9, IAS 39, earnings management, banks, and IFRS were the senior keywords in WOS. These tables show that using the keyword search "IAS 39" OR "International Financial Reporting Standards 39", OR "IFRS 9" OR "International Financial Reporting Standards 9" OR "expected loss model" OR "ECL model", the keyword IFRS 9 co-occurred 31 times, IAS 39 co-occurred 22 times, Earnings management co-occurred 17 times, Banks co-occurred 14 times, and IFRS co-occurred 13 times in WOS. IAS 39, IFRS 9, and earnings management had 63, 45, and 44 links, respectively. These words are the strongest links for all keywords.

Table 2. The cluster of all keywords that co-occurred for the selected words in WOS.

Cluster	Keywords
1	IAS 39, Risk, Credit risk, Impairment, Financial crisis, Economic consequences.
2	IFRS 9, IFRS, International accounting standards, loan loss provisions, Finical instruments, Financial assets, Hedge accounting, Disclosure, Banks.
3	Earnings management, Earnings, Fair value, Information, Quality, Valuation, Adoption, Impact, contribute.

Table 3. strongest occurrences and Most mutual co-occurring for the selected words in WOS

Keyword	Links	Total link strength	Occurrence
IAS 39	22	63	22
IFRS 9	16	44	31
Earnings management	18	45	17
Banks	18	42	14
IFRS	15	35	13
Financial instruments	14	25	12
Quality	16	37	10
Impairment	12	23	6
Information	15	33	9
Adoption	15	27	9
Fair value	10	13	8
Financial crisis	13	22	7
Risk	8	9	7
Credit risk	4	7	6
Hedge accounting	7	11	6
Earnings	15	21	6

Economic consequences	15	23	6
Impact	15	18	6
Loan loss provisions	9	14	5
International accounting standards	10	13	5
Disclosure	8	10	5
Valuation	9	11	5
Financial assets	4	4	5
Contribute	10	14	5

The total link strength of the keywords shows IFRS 9, IAS 39, and earnings management with linked keywords in WOS. Keyword IFRS 9 linked to banks, credit risk, risk, impairment, loan loss provisions, fair value, and contributes. International accounting standards, financial instruments, disclosure, hedge accounting, earnings, adoption, impact, valuation, and financial assets were the keywords linked to the IAS 39 keyword. Additionally, information, IFRS, economic consequences, quality, financial crises were linked with earnings management. Keywords that hold higher strength with the linked keywords show how these keywords are bound together. Keywords that carry greater strength with matching keywords demonstrate how strongly such keywords are limited together. For example, banks, credit risk, and impairments have the greatest connection to IFRS 9 This means that keywords banks, credit risk, and impairment are heavily used with IFRS 9 as credit risk is the main issue for banks that are related to this standard.

All search words fall under the keywords, and they were divided into three clusters: Standards, Risk, and Management cluster **(Figure 3)**. The first cluster focuses on a set of issues related to IAS 39 and IFRS 9. The second cluster includes matters related to risk, and the third cluster includes cases related to management. These clusters helped us to find patterns from the concept matrix in the literature **(Table 4)**.

Figure 3. Clusters the keywords (author illustration)

Tables 4 and 5 illustrate the 20 papers studied that focus on IFRS 9 and IFRS 39 that show clear interest alongside the standards and risk but less on the management side. Although studies focus on the standards side, it shows that the previous studies didn't focus on hedge accounting. Additionally, the risk cluster shows there are not enough studies on economic consequences. As for the management cluster, it appears earnings and earnings management may not be enough studies covering this topic.

Table 4. Clustered topics discussed in 20 specific publications (articles)

Reference	**Clusters**																							
					Standards							**Risks**								**Management**				
Keywords	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**	**M**	**N**	**O**	**P**	**Q**	**R**	**S**	**T**	**U**	**V**	**W**	**X**
Bholat, Lastra, Markose, Miglionico, and Sen (2018)	X	X	X	X		X	X	X	X	X	X	X	X	X			X	X	X	X	X	X	X	X
Fiechter, Landsman, Peasnell, and Renders (2017)	X		X	X		X	X	X	X	X	X	X		X		X	X	X	X		X	X	X	
Gebhardt (2016)	X	X	X	X		X		X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X

Giner and Mora (2019)	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Gomaa et al. (2019)	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Guorong (2019)	X	X	X	X	X	X			X	X	X	X	X	X			X	X	X	X	X		X	
Hashim, Li, and O'Hanlon (2016)	X	X	X	X	X	X		X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X
IONESCU (2019)	X	X	X	X		X			X	X	X	X	X	X				X	X				X	
Jin, Kanagaretnam, and Lobo (2018)			X	X		X	X	X	X		X	X		X		X	X	X	X	X	X		X	X
Krüger, Rösch, and Scheule (2018)		X	X	X		X	X		X		X	X	X	X		X	X		X	X	X		X	X
Miu and Ozdemir (2017)	X	X	X	X	X	X			X		X	X	X	X					X	X	X	X	X	X
Reitgruber (2013)	X	X	X			X	X		X		X	X	X					X	X	X	X		X	
Remenarić, Čevisović, and Kenfelja (2018)	X	X	X	X		X		X	X	X	X	X	X					X	X	X		X	X	
Volarević and Varović (2018)	X	X	X	X	X	X		X	X	X	X	X	X				X	X	X	X	X	X	X	
Yang and Du (2016)	X	X	X	X		X			X	X	X	X	X	X				X	X	X	X		X	
(Barth, Jagolinzer, & Riedl, 2010)	X		X	X	X	X		X	X	X	X	X			X	X	X	X	X	X	X			

S. Landini a (2019)	X	X	X	X	X			X		X	X	X	X	X				X	X	X			

A. IAS 39; **B.** IFRS 9**; C.** IFRS**; D.** International accounting standards**; E.** Hedge accounting;**F.**Impairment; **G.**Loan loss provisions**; H.** Disclosure**; I.** Financial instruments**; J.** Financial assets; **K.**Banks; **L.**Risk; **M.** credit risk; **N.** Financial crisis; **O.** Economic consequences; **P.**Earnings management; **Q.**Earnings; **R.** Fair value; **S.**Information; **T.**Quality; **U.**Valuation; **V.** Adoption; **W.**Impact; **X.**Contribute

Table5. Clustered topics discussed in 20 specific publications (Proceeding papers)

Reference	**Clusters**																							
	Standards								**Risks**								**management**							
Keywords	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**	**M**	**N**	**O**	**P**	**Q**	**R**	**S**	**T**	**U**	**V**	**W**	**X**
Csaba (2017)	X	X	X			X	X		X	X	X	X	X	X					X	X		X	X	
Csaba (2018)	X	X	X			X	X		X	X	X	X	X	X						X		X	X	
Tominac and Vašiček (2018)	X	X	X		X	X		X	X	X	X	X	X				X	X	X	X			X	

A.IAS 39;**B.** IFRS 9**; C.** IFRS**; D.** International accounting standards**; E.** Hedge accounting **F.**Impairment; **G.**Loan loss provisions**; H.** Disclosure**; I.** Financial instruments**; J.** Financial assets; **K.**Banks; **L.**Risk; **M.** credit risk; **N.** Financial crisis; **O.** Economic consequences; **P.** Earnings management; **Q.**Earnings; **R.** Fair value; **S.**Information; **T.**Quality; **U.**Valuation; **V.** Adoption; **W.**Impact; **X.**Contribute

Table 6. Shows a summary of the 20 studies (the most relevant studies in the research topic on WOS) that were examined in this research to identify the titles, objectives, methods, findings, and limits of previous studies.

Title	Author (Year)	Document type	Objective	Methodology	Main Finding	Limit of the Study
"Bank loan loss accounting and its contracting effects: the new expected loss models"	Giner and Mora (2019)	Article	discussing the causes of the changes introduced by IFRS 9 and examine the differences between the FASB models and IASB	Comparative analysis	IAS 39 and IFRS 9 have desolated the incurred approach to adopt an expected loss approach	the differences in business models need to explain. Besides, identifying new methods for more research in the financial sectors.
"Testing the Efficacy of Replacing the Incurred Credit Loss Model with the Expected Credit Loss Model"	Gomaa et al. (2019)	Article	providing proof on the possible efficiency of the replacement of the Incurred Credit Loss (ICL) Model of IAS 39 by the ECL model of IFRS 9 to account for credit impairment losses	three different compensation schemes for the ECL model that were used as a controlled laboratory environment for the test-bed.	The combined effects of eliminating the ' probable ' minimum threshold requirement and permit managers to integrate forward-looking data will increase the volume and appropriateness of periodic reserve decisions	examine potential and ex-post consequences of the implementation of ECL model accounting policies
" Study on the Influence of Innovation and Reform of Accounting Policies on the Impairment of Commercial Bank Credit Card"	Guorong (2019)	Conference	Creating a theoretical model of impairment of financial assets in compliance with the new accounting standards and suggests a method for the impairment of credit card business according to the new accounting standards.	multiple regression models	comparing with IAS 39, the implementation that was used under IFRS 9, the asset of credit card needing to be impaired and significantly improve the impairment of assets.	The need for financial institutions to implement IFRS 9 after China's Ministry issued "Chinese Version of IFRS 9" which lead to major changes in the provision for impairment of financial assets.
" IFRS 9 BENCHMARKING TEST: TOO COMPLICATED TO WORTH DOING IT?"	IONESCU (2019)	Article	Discussing the IFRS 9 benchmarking test in situations where the time value of the money element included in the interest of a financial asset (a loan) is modified and proposing	Benchmark analysis	the analysis using forward interest rates and interest rate models for an instrument with a long tenor (30 years in this case) will reach similar results for the analyzed instrument.	Just two types of modeling, based on the idea of past information used to predict future interest rates that can not through forever.

Title	Author (Year)	Document type	Objective	Methodology	Main Finding	Limit of the Study
			two modeling techniques to carry out the test.			
"Discretion in bank loan loss allowance, risk-taking, and earnings management."	Jin et al. (2018)	Article	Studying whether banks use the Loan Loss Allowance (LLA) for efficiency or opportunistic reasons.	A pooled cross-sectional estimation approach	We find that the abnormal loan loss allowance is unrelated to the next period's loss prevention and just meeting or beating the prior year's earnings.	Whether and how the discretion of managers in estimating the loan and lease allowance affects the stability of the bank during the crisis period and the risk is taken by the bank during the pre-crisis period.
"The impact of loan loss provisioning on bank capital requirements."	Krüger et al. (2018)	Article	Analyzing the interaction between loan loss provisioning and bank capital	Describing the link between IFRS 9 and Basel bank capital regulation and loan loss provisioning. Second, the impact on the eligible regulatory capital of IFRS 9.	The revised loan losses provisioning based on the International Financial Reporting Standards (IFRS) and the Generally Accepted Accounting Principles (GAAP) of the United States means a reduction in Tier 1 capital.	the effects of the new provisioning approach on comprehensive bond data
"THE IMPACT OF IFRS 9 ON LOAN IMPAIRMENTS IN CROATIAN BANKS"	Tominac and Vašiček (2018)	Conference	The paper examines the main challenges in the area of data availability, allocation criteria, impairment model, and macroeconomic factors when implementing the IFRS 9	Review	It can be concluded that there has been no significant change in the reclassification of financial instr uments.	Investigating if the current impairment model is expected to have a significant impact on banks ' systems and processes. Because of its comprehensive new data and measurement criteria.
"INTERNAL MODEL FOR IFRS 9 - EXPECTED CREDIT	Volarević and	Article	Introducing a new internal model for ECL calculation to IFRS 9.	multi-criteria decision-making model which is based on	the article suggests a solution for implementing of new IFRS 9	guidance on how to adopt and what needs to be considered for

Title	Author (Year)	Document type	Objective	Methodology	Main Finding	Limit of the Study
LOSSES CALCULATION"	Varović (2018)			analytic Hierarchy Process (AHP) method		the effective implementation of the ECL impairment model
"Nonperforming loans at the dawn of IFRS 9: regulatory and accounting treatment of asset quality"	Bholat et al. (2018)	Article	This paper shows a comprehensive analysis of Nonperforming loans and considers variations in the treatment of NPLs across countries, firms, and accounting regimes.	Comparative analysis	NPLs and their under-supply pose a risk to economic and financial stability, and policymakers generally agree to early identification of expected losses in good times to lead to greater bank resilience and mitigate the impact of crises on bank balance sheets.	The difficulty of assessing the quality of assets by banking regulations and investors due to the absence of a common global standard for assets classification.
"Is the effect of current rules of international accounting and prudential tools make the bank reserving pro-cyclical? – Modeling of impairment under IFRS 9 and countercyclical capital buffer."	Csaba (2018)	Article	Modeling the relationship between the impairment model under the new IFRS 9 standard and the Basel III prudential capital buffer.	Migration matrix	the countercyclical buffer compensates for the increasing impairment amount. The impairment amount is increasing during the recession due to the expected shortfall.	the time and amount of recognition allowance of loss
"Binomial model for measuring expected credit losses from trade receivable in non-financial sector entities."	Remenarić et al. (2018)	Article	To what extent the current impairment model can be modified to offset the requirements of the new impairment model.	Literature review and analysis of the applicability of the IFRS 9 through practical publications and examples from non-financial sector entities.	Entities would benefit from employing the binomial model to measure impairment losses, as they would have to make fewer changes to their current impairment model to the binomial	models should be used to predict expected credit losses in non-financial sector entities.

Title	Author (Year)	Document type	Objective	Methodology	Main Finding	Limit of the Study
					model than to the provisioning matrix model.	
"Modeling of a provision under new International Financial and Reporting Standard (IFRS 9)"	Csaba (2017)	Article	Modeling the potential effect of IFRS 9 on the calculation of the allowance compared to IAS 39, focusing on the two main dimensions of impairment recognition, namely time and amount.	Migration matrix	The result showed IFRS 9 recognise loan loss provision earlier and with the higher amount then IAS 39. Also, the timeliness of the provision is destroyed if there is uncertainty in the economic circumstances.	modeling the possible effect of the IFRS 9 on the calculation of allowances compared to the IAS 39
"The IFRS option to reclassify financial assets out of fair value in 2008: the roles played by regulatory capital and too-important-to-fail status."	Fiechter et al. (2017)	Article	This research focuses on whether the accounting reclassification alternative is influenced by whether a bank enjoys immunity from interference by bank regulators (regulatory forbearance) as well as the security of taxpayers in the case that capital injection is needed.	a probity regression	The findings provide evidence that the accounting choices made by managers are affected by the importance of their firms to the economies in which they reside.	Compulsory change in the capital ratio of banks
"Adapting the Basel II advanced internal ratings-based models for International Financial Reporting Standard 9"	Miu and Ozdemir (2017)	Article	How can internal-ratings-base (A-IRB) advanced models be used to estimate expected credit losses for IFRS 9?	A-IRB models	By leveraging the A-IRB models, banks can reduce their modeling efforts in meeting IFRS 9 and capture the synergy among different modeling.	How banks may be implemented PD, LGD, and EAD models on secured and discussing the issues related to the estimation of the expected credit loss for IFRS 9. Due to the absence of international measurement standards for these models.
"Impairments of Greek government bonds	Gebhardt (2016)	Article	analyzing for an individually significant exposure of Greek government bonds	The cumulative default rates for Moody's	The IFRS 9 leads to earlier impairments. As long as the credit risk has not modified the recognition of 12-month expected credit losses may even result in an	The IFRS 9 impairment rules are an improvement compared to IAS 39. However, the measurement of impairment losses will rely even more on the

Title	Author (Year)	Document type	Objective	Methodology	Main Finding	Limit of the Study
under IAS39 and IFRS 9: A Case Study."					over provisioning and for financial assets measured at amortised cost to book values below fair value.	expectations (and incentives) of management.
"Expected-Loss-Based Accounting for Impairment of Financial Instruments: The FASB and IASB Proposals 2009-2016"	Hashim et al. (2016)	Article	This paper discusses the diverse variety of expected-loss-based proposals released separately or jointly by the FASB and the IASB since 2009 and compares the key characteristics of the several credit-loss impairment criteria developed by both standard setters	Review	It is possible that, once both the IASB and FASB standards become operational, pressures for a converging approach could re-emerge as a result of the costs imposed on users and preparers of the financial statements by substantially different results of the two non-converged methods.	The potential effect of the differe nces between the final requireme nts of the two standard setters
"Rating-transition-probability models and Comprehensive Capital Analysis and Review stress testing: methodologies and implementation."	Yang and Du (2016)	Article	introducing a risk component, called the credit index.	the Bayesian estimation method	An interconnected structural, virtual model is built under the Black-Cox setup.	the need to provide an effective tool to the practitioners for the use of transition probability models
"Expected Loss and Impact of Risk: Backtesting Parameter-Based Expected Loss in a Basel II Framework"	Reitgruber (2013)	Article	It provides a top-down practical approach to assessing expected loss (EL) quality by back testing with a properly defined risk measure is introduced.	The internal ratings-based approach (IRBA)	A new framework was suggested to stratify parameter based expected loss (EL) estimates with actual Impact of Risk.	Determined back testing procedures for the expected loss (EL) and their effect on pricing and the risk-adjusted profit metrics.
"Market Reaction to the Adoption of IFRS in Europe"	Barth et al. (2010)	Article	Examination of European stock market reactions to 16 events related to the adoption of	Cross-Sectional Analysis	The finding an incrementally positive reaction for European companies with lower data quality pre-adoption and higher	The adoption of IFRS resulted in a broad cross-section of companies domiciled in European countries with a variety of domestic accounting standards

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			International Financial Reporting Standards (IFRS) in Europe		information asymmetry pre-adoption adoption.	changing simultaneously to a common set of standards.

Discussion

This review has provided an overview of the issuance and adoption of Standard 39 in 2003 to the date it was replaced by IFRS 9 and subsequent studies until 2019. The study revealed that there is a clear interest in IFRS 9, which included three main issues ("classification and measurement", "impairment" and "hedge accounting". According to (IASB, 2009) there is also concern about the operational difficulties and the cost that the model implementation will generate and the problems that users may face in estimating credit losses and the difference between initial estimates and future estimates for a model over the life of the loan due to the lack of a fixed equation for calculation.

It was observed after analyzing The most generally co-occurring keywords search related to the selected words in WOS that risk, credit risk, impairment, banks and contribute were the closest words from IFRS 9 as the figure 2. On the one hand, after examining 20 studies, they were found to have used risk 20 times (all studies under test), credit risk 17 times, impairment 20 times (all studies under test), banks 20 times (all studies under test), but contribute was used 8 times only. On the other hand, economic consequences were used four times, and hedge accounting, Loan loss provisions, and Earnings management were used 8 times.

We can see that there is a great focus on the issue of the impairment and credit loss that in IFRS 9 and most studies were in the banking sector. However, there may not be enough studies on hedge accounting, Loan loss provisions, Earnings management, and replaced the IAS 39 with IFRS 9 on the economic consequences.

Conclusion

The purpose of this study is to use the bibliometric analysis to evaluate the previous studies of the mandatory replacement of IAS 39 by IFRS 9. We examined this for papers are in the web of science. The study consisted of 121 papers. Accordingly, it has been noted that the first study in the sample was reported in 2003 and the studies in this field have been growing throughout time; a significant growth has been observed from 2003 to 2019. The most common keywords were identified by these studies, and 20 composition-studied papers were examined based on five steps to know how these studies used the most common words. Then these studies were summarised and their objectives and results determined.

After the global financial crisis in 2007-08, this led to a sharp growth in the literature related to IAS 39 and IFRS 9. Furthermore, in 2017, the largest number of studies reached 22, and the total number of citations was 95 with a note of an increase in the number of citations in 2018 and 2019 was 139 and 180, respectively. Additionally, the English language is still the main trend of the language in financial crisis research.

Additionally, while no practical studies about IFRS 9 because adequate time series data is not available to conduct the impact. Few studies have been completed predicting the impact from the theoretical perspective, few studies cover 1-year's impact as well (Shuman & Arman, 2020). This review has provided an overview of the issuance and adoption of IFRS 9 on banks. The study revealed that there are few studies in developing countries on the topic of compliance with International Financial Reporting Standards (IFRS). Besides, The application of IFRS was criticised on the basis that IFRS was meant for a developed economy and that the principles upon which IFRS are based may not be appropriate for application in developing countries (ALIU, 2019).

The extent of studies does not reach any conclusive evidence regarding the IAS 39 and IFRS 9. Additionally, most of the researches cover the US and European countries. Based on the authors, among the top 10 authors,4 from the UK, 4 were from the USA, 1 from Canada, and 1 from Holland. Barth et al. (2010) who are from the USA had the top citation article, which reached 253 times. Moreover, most of the previous studies examined the ECL model before the application of international financial reporting standards 9. With the note that banks and financial entities forced applying the international standards to adopt a new model on 01/01/2018.Nonetheless, this study can be useful for future search trends as it gives previous studies of the research topic/problem. The authors would recommend that future research on IAS 39 and IFRS 9, the quest be changed by using more oriented keywords and using more keywords while restricting the research topic. Also, they could fill the gap that we highlighted. Moreover, the researcher believes that the present search strategy yielded an unbiased sample of recent relevant studies. Accordingly, the authors would recommend that future research for the impact of the ECL model and IFRS 9 on the banks should be more in all countries and particularly in developing countries.

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